Appendix A

Notice of Preparation and Comment Letters

NOTICE OF EIR PUBLIC SCOPING MEETING

SUBJECT: NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

PROJECT: MORRO BAY GENERAL PLAN AND LOCAL COASTAL PROGRAM UPDATE

A Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the City of Morro Bay will prepare an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Morro Bay General Plan and Local Coastal Program Update. The proposed project is a comprehensive update of the City's General Plan and Local Coastal Program (Plan Morro Bay), as required by State law (Government Code Section 65300). The updated General Plan and Local Coastal Program (Plan Morro Bay) and its implementing programs will serve as the blueprint for future growth and development within the City Planning Area.

PUBLIC COMMENTS

The City of Morro Bay is soliciting the views of responsible and trustee agencies as well as interested persons as to the scope and content of the environmental information to be included in the EIR. All comments to the NOP are due no later than December 8, 2017. Please send your comments to the mailing address or email addresses shown below. Include a return address or email address and a contact name for your agency or group with your comments.

Email comments to:	**Mail comments to:**
Cindy Jacinth Senior Planner City of Morro Bay cjacinth@morrobayca.gov	Cindy Jacinth Senior Planner City of Morro Bay 955 Shasta Avenue Morro Bay, CA 93442

SCOPING MEETING

A public scoping meeting has been scheduled to allow for any interested persons to supply input on issues to be discussed in the Program EIR:

Date: **Tuesday, November 21, 2017**
Time: **4:00 p.m. to 6:00 p.m.**
Place: **Facility Room, Veteran's Memorial Building, 209 Surf Street**

The meeting is an opportunity for City and consultant staffs to gather information from the public regarding the potential environmental impacts of the project that need to be evaluated in the Program EIR. It is not intended to be a hearing on the merits of the project. Therefore, members of the public should limit their comments focused on potential significant changes to the environment that may occur as a direct result of project development.

DOCUMENT AVAILABILITY

Copies of the complete NOP are available at the Morro Bay Library (625 Harbor Street), Community Development Dept, 955 Shasta Ave., and at City Hall (595 Harbor Street).

NOTICE OF PREPARATION

Date: November 8, 2017

To: California Office of Planning and Research, Responsible and Trustee Agencies, and Other Interested Parties

Subject: Notice of Preparation of an Environmental Impact Report

Project: Morro Bay General Plan and Local Coastal Program Update

Lead Agency: City of Morro Bay

Review Period: November 8, 2017 to December 8, 2017 (30 days)

This Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the City of Morro Bay as the Lead Agency will prepare an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for the proposed Morro Bay General Plan and Local Coastal Program Update (proposed project). The proposed project is a comprehensive update of the City's General Plan and Local Coastal Program (Plan Morro Bay), as required by State law (Government Code Section 65300). The updated General Plan and Local Coastal Program (Plan Morro Bay) and its implementing programs will serve as the blueprint for future growth and development within the City Planning Area.

A. PROJECT LOCATION AND SETTING

The Project site consists of the Planning Area for the General Plan and Local Coastal Program update (referred to locally as Plan Morro Bay), which contains all land within the Morro Bay City boundaries, as well as lands outside the City to the north, east, and south that bear relation to the City's planning activities as provided in California Government Code Section 65300. The Planning Area encompasses approximately 8,833 acres located in west-central San Luis Obispo County (see **Figure 1**). Existing land uses in the City are shown in **Figure 2**. Morro Bay's City limits and the Planning Area boundary are shown in **Figure 3** and are generally described as follows:

- The City is generally bounded by the Pacific Ocean to the southwest and unincorporated San Luis Obispo County in all other directions. Highway 1 runs southeast-northwest through the right-hand edge of the City. Highway 41 runs east-west and approximately bisects the City north-south.
- The Planning Area boundaries generally coincide with the City limits on the south and west, but to the north the Planning Area extends beyond Toro Creek Road close to the community of Cayucos and more than twice the distance from the

coast to the existing City limits to the east. To the southeast, the planning area extends south of Highway 1 along the Chorro Creek valley (see **Figure 3**).

In the Planning Area, existing on-the-ground land uses include a mix of agriculture (69 percent), residential (8 percent), nonresidential (commercial, office, and industrial) (3 percent), park and open space areas (16 percent), civic/institutional/public (2 percent), roadways, and other infrastructure (<1 percent), and vacant land (<1 percent). Existing land uses in the Planning Area are illustrated in **Figure 2**.

All land surrounding the Project site is located in unincorporated San Luis Obispo County and consists of mostly rural residential and agricultural uses.

B. PROJECT DESCRIPTION

The City of Morro Bay is conducting a comprehensive update of its General Plan and Local Coastal Program (Plan Morro Bay). State law (Government Code Section 65300) requires each city and county to adopt a comprehensive, long-term general plan for its physical development. The City's current General Plan was adopted in 1988 with various amendments made since then, and serves to direct the City's future growth and development as well as its conservation policy. The Local Coastal Program was last updated in 1982 and serves as the City's implementation of the California Coastal Act. The General Plan and Local Coastal Program are being combined into a single document, Plan Morro Bay, which is now being updated to ensure that these guiding policy documents remain useful tools, keep pace with change, and provide workable solutions to current and future issues.

The City has decided to update both the General Plan and the Local Coastal Program at this time. The Local Coastal Program consists of two parts:

- A Coastal Land Use Plan, which is presented as a component of the General Plan.
- A Local Implementation Plan, which is presented as a component of the City's Zoning Ordinance.

The Plan Morro Bay Update Project includes the following components:

1.0 PLAN MORRO BAY

Plan Morro Bay and its implementing programs serve as the blueprint for future growth and development within the Planning Area. These documents contain policies and programs designed to provide decision-makers with a solid basis for future decisions related to land use and development.

Plan Morro Bay documents and presentations developed to date are available at the following website:
http://www.morrobayca.gov/planmb

1.1 Vision & Values Statement

The following community Vision & Values Statement supports the Plan Morro Bay Project:

In 2040, Morro Bay remains a small oceanfront town and thriving year-round destination, known for its natural beauty, creative people, outdoor recreation, working waterfront, and welcoming community spirit. It is a friendly, safe, resilient, and healthy place where people of all ages and economic levels live, work, play, and visit.

The natural environment and wildlife are cherished and conserved and are essential elements that integrate with and define our urban landscape. Our healthy wetlands, iconic Morro Rock, and bustling harbor are complemented by expansive parks, connected bicycle lanes, safe streets, and pathways that are accessible to people of all ages and abilities.

We have a deep appreciation for nature and honor our native, cultural, and maritime heritage. We maintain and support our working waterfront and carefully preserve our estuary, watershed, natural shoreline, and surrounding open space. We adapt to changes in the climate, economy, and culture without compromising our small-town character.

Our vibrant economy is strengthened by sustainable resource practices, a responsive City government, and leading-edge technology that empowers local business owners and attracts new businesses and investors. We are a diverse, multigenerational community where head-of-household jobs, sustainable living wages, and affordable housing options serve as a foundation that allows people of all ages and income levels to thrive.

Modern, well-maintained public amenities and supportive community services nurture our residents, community organizations, and neighborhood groups. We actively participate in government decisions and take pride in volunteerism. We welcome personal expression and creativity, as reflected in our varied visitor attractions, bustling dining scene, vibrant arts culture, community events, public art, and outdoor activities. Our diverse housing, safe and eclectic neighborhoods, and reliable transit system are enhanced through suitable urban infill and mixed-use development that accommodates modest residential and commercial growth.

Mindful of our rich heritage, we take great pride in our community and work together toward a bright future.

1.2 Plan Morro Bay Structure

The General Plan must include subject matter identified in State law for the following State-required elements or topics: Land Use, Circulation, Housing, Conservation, Open Space, Noise, Safety, and Environmental Justice. The Local Coastal Program must address priority issues for the California Coastal Commission. These topics are public access, recreation and visitor serving facilities, water quality protection, Environmentally Sensitive Habitat Areas (ESHA) and other natural resources, agricultural resources, new

development and cultural resources, scenic and visual resources, coastal hazards, shoreline erosion and protective devices, and energy and industrial development.

The updated Plan Morro Bay will be divided into 15 sections and elements, which together address the topics mandated by the State and Coastal Commission, as well as additional topics of interest to the City. The 10 elements are grouped into a Blueprint and a Greenprint. Each section is briefly described below.

1. **Introduction**: Addresses the purpose and scope of the General Plan and Local Coastal Program; background on Morro Bay's history, current demographics, and economic conditions; planning context (other local and regional plans); the relationship of the General Plan and Local Coastal Program to other plans and documents, including the City's Municipal Code; and the geographic area and topics covered in the General Plan/Local Coastal Program.

2. **Vision**: The Community Vision section of Plan Morro Bay establishes a Vision & Values statement for the city. This statement sets forth a comprehensive vision for Morro Bay in the future and identifies the community's key priorities. This statement guides each element of Plan Morro Bay to achieve the goals of the community.

3. **Blueprint:** The Blueprint serves as a framework for development decisions in the city through 2040. This section will guide actions for residents, businesses, decision-makers, City staff members, and project developers in Morro Bay.

    a. **Land Use:** The Land Use Element represents the foundation of the Blueprint and the City's guide to the evolution of development patterns in Morro Bay. This element guides future development and designates appropriate locations for land uses in the city. Land Use Element goals and policies serve as a road map for the future physical development of the community by identifying the general location, distribution, and intensity for a range of residential, commercial, industrial, and institutional land uses in Morro Bay. Land Use Element goals and policies also address coastal-dependent and coastal-related uses.

    b. **Community Design:** The Community Design Element outlines a vision for the aesthetic development of the community and character of Morro Bay. This element establishes the City's long-term community design and development goals to maintain a unique city culture and identity with respect to community form, layout, and community character areas.

    c. Economic Development: The Economic Development Element includes goals and policies to maintain and improve job development and retention and to promote economic resiliency. This element addresses the economic implications of future development relative to housing affordability, market surplus and leakage, and demographic trends in Morro Bay through 2040.

d. **Circulation:** The Circulation Element defines the local and regional transportation networks and describes how community members get around the city using streets, sidewalks, transit routes, and bicycle paths. The transportation network is a major determinant of development form and land use. Traffic patterns, congestion, access to transit, ease and safety of walking or bicycling, and other factors help to determine where people decide to live, work, or visit in Morro Bay. This element facilitates the mobility of people and goods throughout Morro Bay using multiple travel modes to promote practices aligned with City goals.

e. Noise: The Noise Element addresses existing and future noise conditions in Morro Bay, identifies noise problems and their sources, describes how noise affects community safety, health, and comfort, and establishes policies and programs that limit excessive noise levels and improve noise/land use compatibility. Noise conflicts may affect the desirability of specific regions or neighborhoods within the community, which may interfere with the development goals for the city. Through established noise standards, community form will be preserved and maintained in accordance with City goals.

f. Community Well-being: The Community Well-Being Element addresses the community's unique population's health and wellness needs, in addition to environmental equity. Morro Bay has a diverse, multigenerational demographic spread with potential to affect the city's future resiliency. Community Well-Being Element goals and policies assess the local quality of life and population vulnerabilities to help plan for an evolving community.

g. Housing: The Housing Element serves as a tool to identify and provide for the housing needs of the community. It identifies recent demographic and employment trends that may affect existing and future housing demand and supply. California law requires the Housing Element to establish policies and programs that will support the provision of an adequate housing supply for citizens of all income levels. The Housing Element is the only element that requires review by the State. The element addresses the City's ability to meet the regional housing needs as determined by the State of California.

4. **Greenprint:** The Greenprint serves as a framework for how the City can use and manage its resources to benefit the community and guide it toward a more resilient and sustainable future. This section links open space, agricultural, and natural resource preservation with the development plans described in the Blueprint. The chapter is grounded in a shared vision from the community, boards and commissions, and City staff and officials for a sustainable community that sets policies and programs to achieve this shared vision. It is implemented by City ordinances, specific plans, programs, and ongoing activities.

a. Conservation: The Conservation Element addresses the use and preservation of natural resources to improve the environmental quality of

Morro Bay for years to come. Topics covered in this element include important biological communities, air quality, greenhouse gas emissions, water resources and conservation, energy resources, waste management, visual resources and viewsheds, and coastal resources. Conservation Element goals and policies promote a resilient, sustainable community offering a balance of open spaces, coastal access, and a quality built environment both along the coastline and inland.

b. Open Space: The Open Space Element outlines a vision for facilitating coastal access and providing a range of community facilities, parks, and recreation opportunities. This element addresses the protection of natural habitat and wildlife by designating open space areas throughout the community. Open Space Element goals and policies include specific steps to protect and improve Morro Bay's coastal trails, parks, and facilities and to enhance and maintain open spaces in the coastal zone.

c. Public Safety: The Public Safety Element minimizes community risks associated with natural and man-made hazards. This element identifies hazards that could be made more severe by the city's location on the coast and anticipated climate change impacts. Public Safety Element goals and policies address natural hazards, coastal adaptation, and emergency response to protect residents, visitors, and wildlife from anticipated impacts.

5. **Implementation:** Sets forth specific actions and tools for implementation of Plan Morro Bay, along with a detailed work program. Describes the process for maintaining and monitoring progress in implementing Plan Morro Bay.

6. **Glossary and Acronyms:** Provides a list of acronyms and definitions for key terms used in Plan Morro Bay.

7. **Appendices**: A series of background reports and technical appendices.

The topics of importance in the Coastal Act to be included in the Local Coastal Plan will be addressed in the elements as identified in **Table 1**.

TABLE 1
TOPICS OF IMPORTANCE IN THE COASTAL ACT

Plan Morro Bay Element	Public Access	Recreation and Visitor Serving Facilities	Water Quality Protection	ESHA & Other Natural Resources	Agricultural Resources	New Development & Cultural Resources	Scenic & Visual Resources	Coastal Hazards	Shoreline Erosion & Protective Devices	Energy & Industrial Develop-ment
Blueprint										
Land Use	X	X			X					X
Community Design										
Economic Development										
Circulation	X									
Noise										
Housing										
Greenprint										
Conservation			X	X		X	X			X
Open Space		X								
Public Safety								X	X	
Community Well-being										

X = Chapter that primarily addresses element requirements

Note: The management of timberlands does not occur in Morro Bay and therefore is not included in the table above as a topic of importance in the Coastal Act.

1.3 Land Use Diagram

The General Plan Land Use Diagram (**Figure 3**) establishes the general pattern of uses in the Planning Area. The maximum permitted land use densities and intensities will be identified in Plan Morro Bay for these land uses. As the density and intensity standards for each land use designation are applied to future development projects and land use decisions, properties will gradually transition from one use to another, and land uses and intensities will gradually shift to align with the intent of Plan Morro Bay. Within the future Sphere of Influence area identified on the Land Use Diagram, future uses may be developed subject to annexation to the City of Morro Bay in compliance with procedures identified by the San Luis Obispo County Local Agency Formation Commission (LAFCO).

Table 2 identifies anticipated land use changes that would occur with implementation of Plan Morro Bay from a 2016 baseline condition. For purposes of the EIR, analysis of potential environmental effects will be based on the net change between 2016 baseline conditions and the proposed Plan Morro Bay (2040).

TABLE 2
ANTICIPATED LAND USE CHANGES

Land Use Designation	Acres (approximate)	Total Estimated Dwelling Units (2040)	Total Estimated Households	Population (2040)	Non-residential Square Feet (2040)
Residential	752.4	6,521		10,783	—
Commercial	281.4	540		893	8,712,030
Industrial	37.2	—		—	729,253
Waterfront Commercial/ Industrial	6.3	—		—	216,145
Mixed Use	33.8	271		447	1,030,854
Open Space & Agriculture	7,569.5	—		25	—
Public/Institutional	152.6	—		—	159,279
Total (2040)	**8,833.2***	**7,347**	**5,800**	**12,149**	**10,837,321**
Existing (2017) Totals	8,833.2*	6,414	5,063	10,714	6,527,860
Change, 2017-2040	**—**	**933**	**737**	**1,435**	**4,309,461**

Notes:

**Totals may not add up due to rounding*

1.4 Policies Addressing Coastal Issues

Policies to address topics of importance to the Coastal Commission in Plan Morro Bay include:

- Encouragement and preservation of waterfront visitor-serving and coastal-dependent uses including commercial fishing.
- Maintain prime agricultural land in the planning area.
- Protect existing lower-cost facilities including lower-cost accommodations.
- Establish a threshold for lower-cost accommodations, below which additional lower-cost accommodations would need to be developed in the City.
- Plan for additional visitor-serving and other opportunities at major waterfront opportunity sites including the Dynegy site and existing wastewater treatment plant site.
- Protect and promote recreational opportunities in the coastal zone.
- Improve lateral and vertical access along the coast and protect existing access.
- Improve multimodal access in the downtown and waterfront and improve the connection between the downtown and waterfront for pedestrians and bicyclists.
- Monitor coastal access parking demand and adjust parking strategies if needed to maintain sufficient parking.
- Prioritize and protect sensitive habitats. Restore key habitat areas when feasible.
- Protect eelgrass and continue to mitigate its loss during development.
- Protect and improve air and water quality.
- Promote energy efficiency.
- Protect views and viewsheds.
- Preserve Morro Bay Estuary.
- Limit the construction of shoreline structures.
- Develop a historic and cultural resources strategy.
- Maintain sufficient parks and open space.
- Provide quality and varied recreational opportunities.
- Maintain the beach for habitat protection along with human use.
- Protect assets in the City vulnerable to human and man-made disasters.
- Implement adaptive strategies to address the threat of sea-level rise over time.

2.0 ZONING CODE AND COASTAL IMPLEMENTATION PLAN AMENDMENTS

To maintain consistency with updated Plan Morro Bay, the Project also includes a comprehensive Zoning Code Update which includes the Coastal Implementation Plan. Amendments planned as part of the Project include:

- Updating the allowed uses in all zones as necessary for consistency with the General Plan Land Use Designations.
- Establishing new zoning district(s) as necessary to implement the updated General Plan.
- Updating other development standards as necessary to implement the updated General Plan. This will include maximum height, setbacks, design standards and other standards.
- Updating administration and permitting to integrate coastal permit processes. Additional coastal-specific issues to be addressed include:
    - Parking and transportation demand management
    - Coastal access, beach use, and special events
    - Visitor-serving uses and tourism
    - Sea-level rise and coastal resilience
    - Stormwater management and water quality
- The Zoning Code Update will also need to address other issues, such as neighborhood compatibility and economic development, consistent with direction in Plan Morro Bay.

C. TYPE OF ENVIRONMENTAL DOCUMENT

The General Plan and Local Coastal Program Update EIR will be prepared as a Program EIR, pursuant to Section 15168 of the CEQA Guidelines. A Program EIR examines the environmental impacts of an overall area that may contain a series of subsequent projects. This type of EIR focuses on the changes in the environment that would result from implementation of the overall Project, including development of land uses and transportation systems identified in the Project, as well as other infrastructure required to serve the Project. The General Plan and Local Coastal Program Update EIR will serve as the environmental review document for subsequent activities in the Program. Use of a Program EIR provides the City (as Lead Agency) with the opportunity to consider broad policy alternatives and program-wide mitigation measures and greater flexibility to address environmental issues and/or cumulative impacts on a comprehensive basis. Consistent with CEQA Guidelines Section 15168(c), the City will review subsequent activities to determine whether the activity is within the scope of the Project covered by the Program EIR or whether an additional environmental document must be prepared. If the City finds, pursuant to CEQA Guidelines Section 15162, that no new effects could occur or no new mitigation measures would be required, the City can approve the

subsequent activity as being within the scope of the Project covered in the Program EIR, and no new environmental document would be required.

D. PROBABLE ENVIRONMENTAL EFFECTS

The EIR will evaluate whether the proposed Project would potentially result in one or more significant environmental effects. The following issues will be addressed in the EIR:

- Aesthetics, Light, and Glare
- Air Quality
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems
- Energy Conservation and Other Required CEQA Topics

E. DEVELOPMENT OF A REASONABLE RANGE OF ALTERNATIVES

Factors determining project alternatives include considerations of project objectives, site suitability, economic viability, and availability of infrastructure. The Program EIR will discuss the rationale for selection of alternatives that are feasible and therefore, merit in-depth consideration, and which are infeasible (e.g., failed to meet Project objectives or did not avoid significant environmental effects) and therefore rejected. Project alternatives have yet to be finalized.

Alternatives will be general in nature since further environmental issue area analyses would be necessary before more specific project alternatives can be identified.

F. EIR AND GENERAL PLAN UPDATE PROCESS

The Draft EIR will incorporate the input received at the scoping meeting and comments submitted on the NOP. The purpose of the Draft EIR is to examine and disclose the potential environmental impacts of the Project and to identify mitigation measures and alternatives that would reduce and/or avoid significant impacts.

The Draft EIR will have a 45-day public review period in which agencies and members of the public will review and comment on the Draft EIR. Comments received on the Draft EIR will be reviewed and addressed in the Final EIR. The Final EIR will be a document consisting of the Draft EIR, errata or changes to the Draft EIR, and responses to comments on the EIR, as well as any additional technical reports or follow-up documentation that may be necessary. The Morro Bay Planning Commission will hold a public hearing on the Final EIR and make a recommendation to the City Council regarding the Final EIR prior to action on the General Plan Update. The City Council will hold a

separate public hearing on the Final EIR and make its own determination on certification of the Final EIR prior to action on the General Plan Update.

G. PUBLIC COMMENTS

The City of Morro Bay is soliciting the views of responsible and trustee agencies as well as interested persons as to the scope and content of the environmental information to be included in the EIR. In accordance with CEQA, agencies are requested to review the project description provided in this NOP and provide comments on environmental issues related to the statutory responsibilities of the agency. The EIR will be used by the City of Morro Bay when considering approval of the proposed project as well as any related discretionary approvals.

All comments to the NOP are due no later than December 8, 2017. Please send your comments to the mailing address or email address shown below. Include a return address or email address and a contact name for your agency or group with your comments.

Email comments to:	**Mail comments to:**
Cindy Jacinth Senior Planner City of Morro Bay cjacinth@morrobayca.gov	Cindy Jacinth Senior Planner City of Morro Bay 955 Shasta Avenue Morro Bay, CA 93442

H. SCOPING MEETING

A public scoping meeting has been scheduled to allow for any interested persons to supply input on issues to be discussed in the Program EIR:

Date: Tuesday, November 21, 2017
Time: 4:00 p.m. to 6:00 p.m.
Place: Facility Room, Veteran's Memorial Building, 209 Surf Street

The meeting is an opportunity for City and consultant staffs to gather information from the public regarding the potential environmental impacts of the project that need to be evaluated in the Program EIR. It is not intended to be a hearing on the merits of the project. Therefore, members of the public should limit their comments focused on potential significant changes to the environment that may occur as a direct result of project development.

I. DOCUMENT AVAILABILITY

Copies of the NOP and project documents are available at the Morro Bay Public Library (625 Harbor Street, Morro Bay) and at City Hall (595 Harbor Street, Morro Bay).

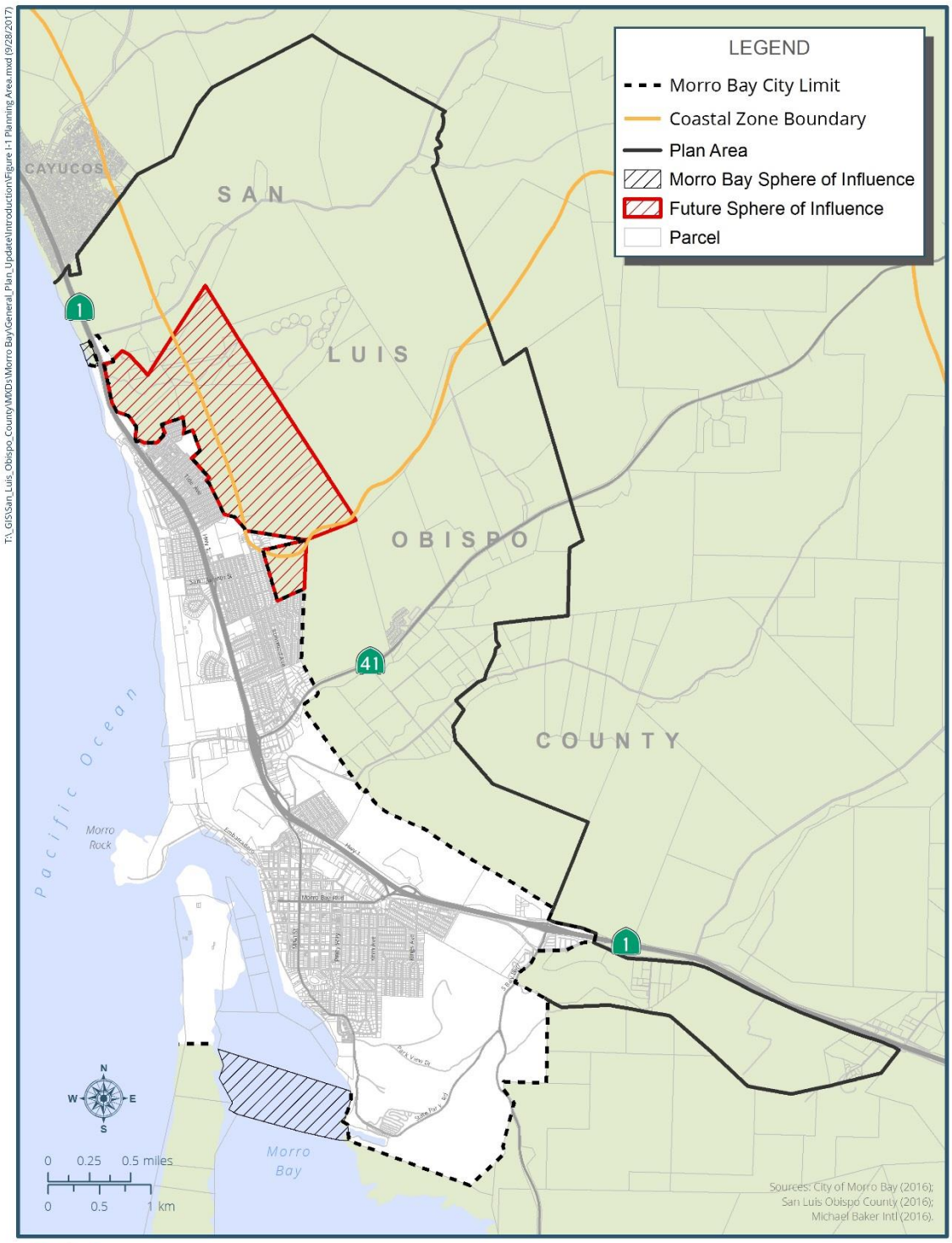

FIGURE 1

Planning Area

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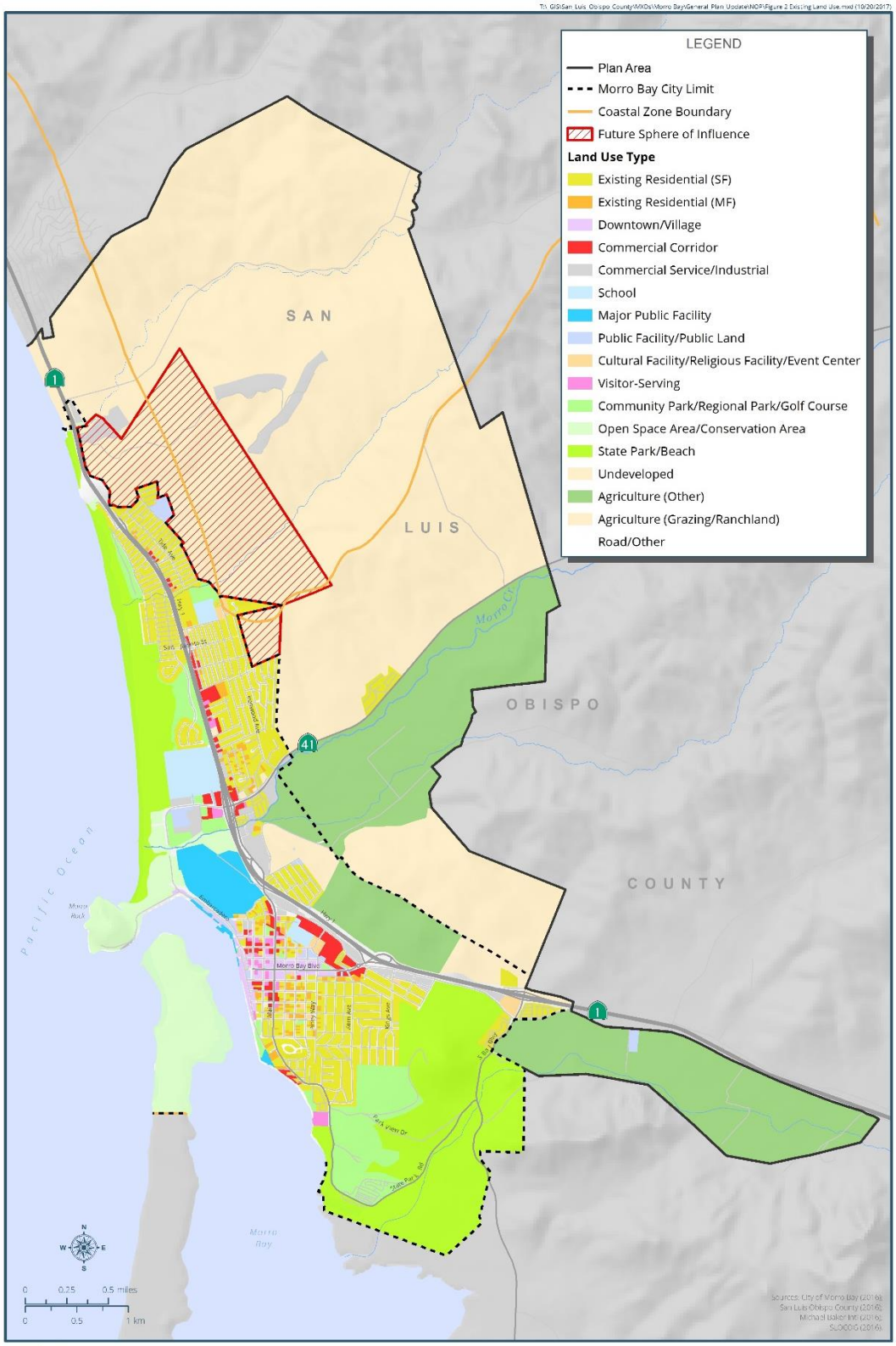

FIGURE 2

Existing On-The-Ground Land Use

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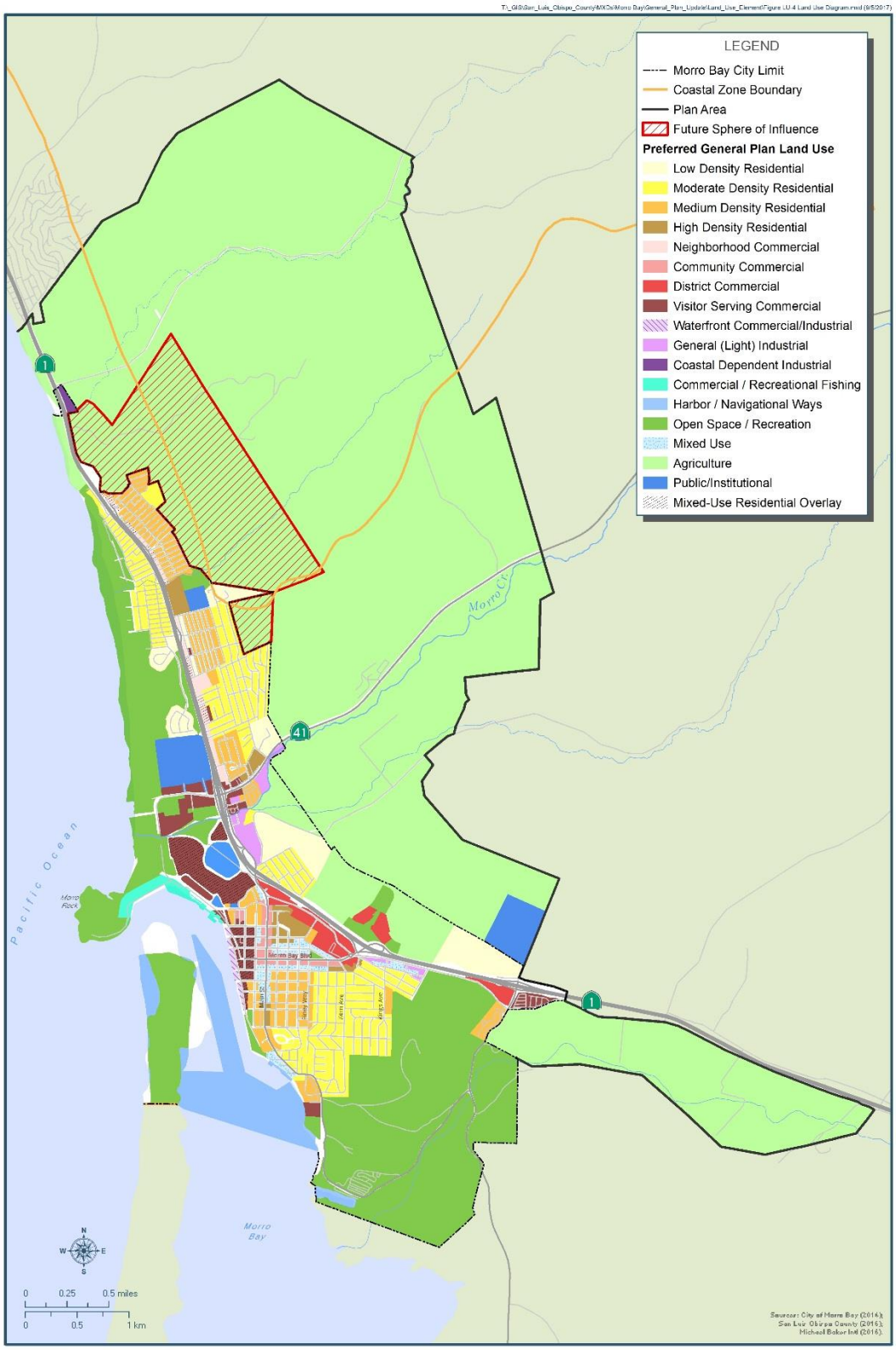

FIGURE 3
Land Use Diagram

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Welcome! Please Sign In...

Printed Name	*Contact Information/Email*
Lynda MERRILL	
KRISTEN HEADLAND	
GLENN SILLOWAY	
Rigmar	
Mallias	
Betty Winholtz	winholtz@sbcglobal.net
Andere Johnson	william.johnson@greenmtn.edu
Carissa Reynolds	cr122@humboldt.edu

Comment Sheet

Please let us know your concerns so we can address them in the Environmental Impact Report.

Name: Lynda Merrill Affiliation: Friends of Wildlife
(resident, businessperson, agency representative, community group member, etc.)

Address: 391 Sequoia St. M.B. Phone: 772-8520

Email:

Comments:

- preserve open space
- create pedestrian friendly roadways
- Keep M.B. a small town
- protect the surrounding parks
- City + ~~Coty~~ State
- Resist major changes

Please submit by December 8, 2017 to:
Scot Graham, Community Development Director
City of Morro Bay
955 Shasta Ave
Morro Bay, California 93422
sgraham@morrobayca.gov

Morro Bay GP/LCP update EIR scoping meeting

Eight attendees signed in. We received one comment card and heard verbal comments from three attendees. Their comments are summarized below.

Rigmar:

- -Asks the definition of SOI.
- -Asks what the plan is for the hatched area on the proposed land use map. To buy it? To annex it? Or to include it in the SOI?

Bill M.:

- -Asks whether the intent is for agricultural land in the SOI to remain in ag.
- -Asks whether the identified ESHA in the Bay is proposed to be removed from ESHA, and if so, what is the purpose or reasoning of that removal. Note that the environmental effects of any ESHA removal would be considered in the EIR.
- -States that the maps showing Special Area B (20 lots) show the incorrect zoning, and that the updated Zoning Ordinance should correct this.
- -Asks if the property at the Tri-W property east of the Morro Bay Blvd off-ramp would be changed from commercial to residential.

Betty W.:

- -States a concern re: the timing of the next GPAC meeting before Christmas.
- -Asks whether biological resources and agricultural resources would be addressed in the EIR. Rincon confirmed that these issues will be addressed in the EIR.
- -Asks whether the EIR will evaluate the required No Project Alternative. Rincon confirmed that the Alternatives analysis will include a range of alternatives, including a No Project Alternative.
- -Asks where 900 new homes would go. Within City Limit? SOI?
- -Asks why annex ag land if it is not to be developed. States that ag land shouldn't be included in the planning area if the plan is not to develop it.
- -Asks if ag land removed from SOI, what would be the % of the town in each land use category. Amy described the % of land in each category without the expanded SOI.

RECEIVED
DEC 14 2017
City of Morro Bay
Community Development Dept.

THE TRUST FOR PUBLIC LAND

101 Montgomery St.
Suite 900
San Francisco, CA
94104
t: 415.800.5276
f: 415.495.4103

tpl.org

December 8, 2017

Cindy Jacinth
Senior Planner
City of Morro Bay
955 Shasta Avenue
Morro Bay, CA 93442

Re: City of Morro Bay General Plan Notice of Preparation of an Environmental Impact Report

Dear Ms. Jacinth,

We appreciate the opportunity to comment upon the scope and content of the EIR which will soon be prepared for the City of Morro Bay's proposed General Plan and Local Coastal Plan Update. As a conservation organization with a long history in San Luis Obispo County more generally and in Morro Bay and Estero Bay more specifically, we recognize and value the unique recreational and environmental resources the City of Morro Bay has to offer. A carefully-crafted General Plan and Local Coastal Plan can protect and enhance those resources while creating opportunities for modest, planned growth in keeping with the community.

We wish to comment upon on the selection of project alternatives which will be considered as part of the EIR. Our organization, together in partnership with others, have been working toward a conservation outcome for the roughly 2,600 acres of land owned by Chevron, which separates the communities of Cayucos and Morro Bay and runs back along Toro Creek Road. Our vision and goals for the property includes pedestrian and bicycle trail connections between Morro Bay and Cayucos, recreational trail access into other parts of the property, protection of the viewshed along Highway 1, visitor serving amenities for the coast, and a significant greenspace separator between the communities. Some of the lots currently owned by Chevron along Panorama Drive, as well as an additional row of lots further inland and disconnected from Panorama Drive, are included in Morro Bay's proposed new sphere of influence.

We ask that as the EIR alternatives are developed, that our project be taken into consideration as a feasible project under development in the proposed area. Our team would be happy to speak at more length about our proposed project with City of Morro Bay Planning staff. Thank you for your consideration.

Sincerely,

Becky Bremser
Senior Project Manager

405 Acacia
Morro Bay, CA 93442
November 23, 2017

Ms. Cindy Jacinth
Senior Planner
City of Morro Bay
955 Shasta
Morro Bay, CA 93442

Dear Ms. Jacinth:

Included here are my views as an interested person in the scope and content of the environmental information to be included in the EIR for the project called the Morro Bay General Plan and Local Coastal Program Update. Some of these written comments I expressed at the scoping meeting on November 21, 2017, at the Vets Hall. Others were not stated at that time. I will indicate those I spoke to.

1. This project is mislabeled. It is not an update of the City's current GP/LCP; it is a complete rewrite with no resemblance in format or at times content to the City's current GP/LCP. This makes it extremely difficult for the public to know what is being lost and what is being added. What protections are we losing; what programs are new and which are old? I object to this way of doing the people's business. There must be some way to do a side by side comparison if not strike out version.

2. Referring to page 3, apparently, the City's Zoning Ordinance will no longer be the only implementation tool for interpreting and implementing the GP/LCP. There will be other documents called implementation documents. It is unclear how these various documents fit together with the GP/LCP and Zoning ordinance, how they don't contradict each other, and if they do, then what? Please clearly state/demonstrate how each document relates to the others, which has authority to override which, or demonstrate they are internally consistent.

3. In the list on page 12, Agriculture Resources is not named as one of the issue areas to be addressed in the EIR. However, it is being suggested that Morro Bay increase its planning area which subsequently increases its ag land from 6% to 69%. The response at the scoping meeting was this issue would be included. If City officials have no developmental designs on ag land, and they claim they don't, then the land outside the City limits or Sphere of Influence should not be included in this scope of this work.

4. In the list on page 12, Biological Resources is not named as one of the issue areas to be addressed in the EIR. This is peculiar since Morro Bay is a Tree City, Bird Sanctuary, and hosts parts of both the Morro Bay State Park and the Morro Bay National/State Estuary within its City limits, as well as numerous blue line creeks and beaches. The response at the scoping meeting was this issue would be included.

5. Section C on page 10 states the EIR will “consider broad policy alternatives and program-wide mitigation measures. Section E on page 12 discusses only project alternatives Neither mentions a No Project alternative. The response at the scoping meeting was the No Project alternative would be addressed.

6. The scoping document on page 11 states this EIR "will serve as the environmental review document for subsequent activities in the Program." What does this mean, i.e. activities as large as the wastewater treatment plant, or as small as enforcing the noise ordinance? Please explain and be specific.

7. Section 1.3 on page 9 identifies a "Figure 3." There is no Figure 3 in the document. Section 1.3 is followed by Table 2 which is suppose to explain Figure 3? Please include figure 3 for clarification.

8. Table 2 on page 9 is confusing and misleading. Column 2 does not add up. Column 1 gives 2017 as a base year to compare to 2040. Yet, 2017 reflects the larger figure of 8833 acres as though it was already part of our planning process, rather than the current 3700 acres in the City's planning area , the City limits. Why is Commercial listed under Dwelling units? Where are the 933 new dwelling units going to be built? This was asked at the scoping meeting. The response was that it would not be in the proposed Chevron annexation area, but then it was not stated where they would be built.

9. A comment about the population of Morro Bay. Table 2 lists a couple of numbers. While they are taken from projections by the US Census, they err. The US Census made the same predictive error between 2000 and 2010 when the population actually went down. Morro Bay has had a population hovering around 10,000 since 1980, give or take a hundred or two. This is in spite of 600 more housing units being built. The trend for vacation rentals and property as investment are possible causes. There is no City program, or direction in the economy, to reverse this trend. It is erroneous to believe that the City has a current population of 10,700. It's erroneous to predict the City will increase by 2,000 in 23 years when it's only changed by 200 in 37 years. It may be more accurate to state the City's approximate population based on some other source.

10. Section 1.4 on page 10, bullet 10 states "Prioritize and protect sensitive habitats. Restore key habitat areas where feasible." At the scoping meeting a commenter asked about the proposal to remove the ESH designation in the Bay; the presenter said yes that is true. How does proposing removal of ESH from the Bay not conflict with this statement to prioritize, protect and restore?

11. Table 1 on page 8 lists "Topics of Importance in the Coastal Act." Yet three Articles specifically listed in Chapter 3 of the Coastal Act are not listed on page 8: Marine Environment, Land Resources, and Development. These 3 topics may be subsumed under one of the topics under Section 1.2 on pages 3-4. However, only 10 topics are listed in table 1 while Section 1.2 states 15 elements will be included in Morro Bay's new document, but it lists more than 15 topics and doesn't specifically identify the 3 missing topics listed above. Please clarify by list, what are the elements or sections, and what sub-topics if any are included in each.

12. Since the sewer plant turned wastewater treatment plant turned water reclamation facility is being designed and built simultaneously as the GP/LCP is being written, what if any part of the new facility will be included in the new GP/LCP?

Respectfully submitted,

Appendix B

Community Baseline Assessment

CITY OF MORRO BAY

COMMUNITY BASELINE ASSESSMENT



Prepared for:

CITY OF MORRO BAY
595 HARBOR STREET
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Prepared by:

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MAY 2017

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1.0 Introduction

Plan MORRO BAY

1.0 INTRODUCTION

1.1 BACKGROUND

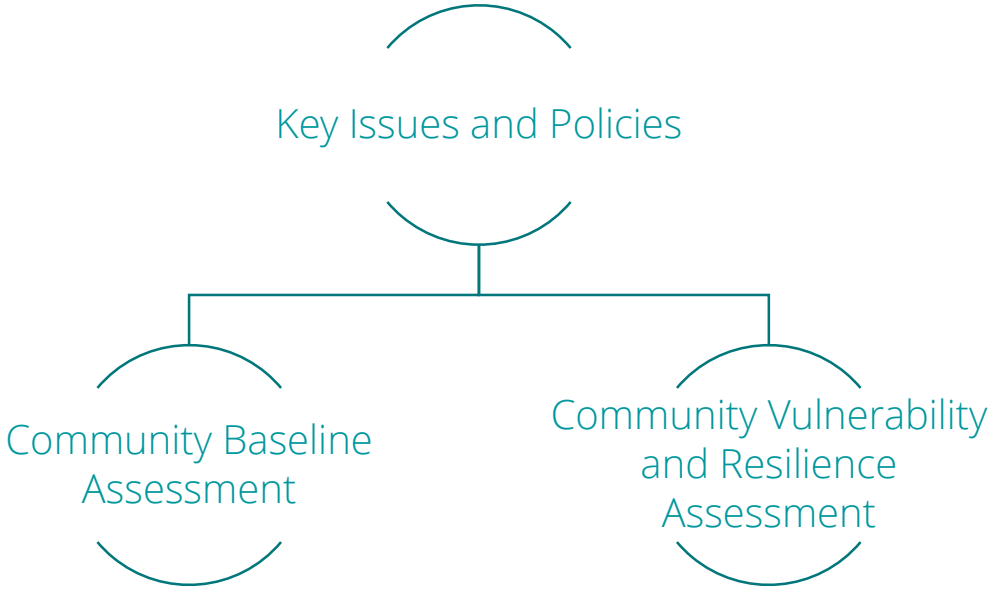
In early 2016, the City of Morro Bay embarked on a project to comprehensively update its General Plan and Local Coastal Program. The project, referred to as *Plan Morro Bay,* will set forth a comprehensive strategy for development and conservation in the city through the year 2040.

The goals, policies, and actions in *Plan Morro Bay* will reflect the community's desires for the future and will be based on public and stakeholder input, direction from elected leaders, and an understanding of historical, existing, and likely future conditions in the planning area. This Community Baseline Assessment (CBA), in conjunction with the Community Vulnerability and Resilience Assessment (CVRA), provides a comprehensive assessment and understanding of these conditions.

1.2 PURPOSE OF THE COMMUNITY BASELINE ASSESSMENT

Taken together with the CVRA, the CBA serves as the technical foundation of *Plan Morro Bay*. The CBA presents historical and existing conditions in the planning area that are relevant to *Plan Morro Bay*, and how such conditions have changed over time. The CVRA assesses how the issues and assets identified in the CBA could reasonably be expected to function given likely demographic, economic, and climate changes through 2040. As shown in Figure 1.1, the CBA and CVRA will eventually be summarized in the Key Issues and Policies report, which summarizes the issues and community features of high importance to the community. This report will be used to develop and prioritize the goals, policies, and actions in *Plan Morro Bay*.

Figure 1.1
Plan Morro Bay's Technical Foundation

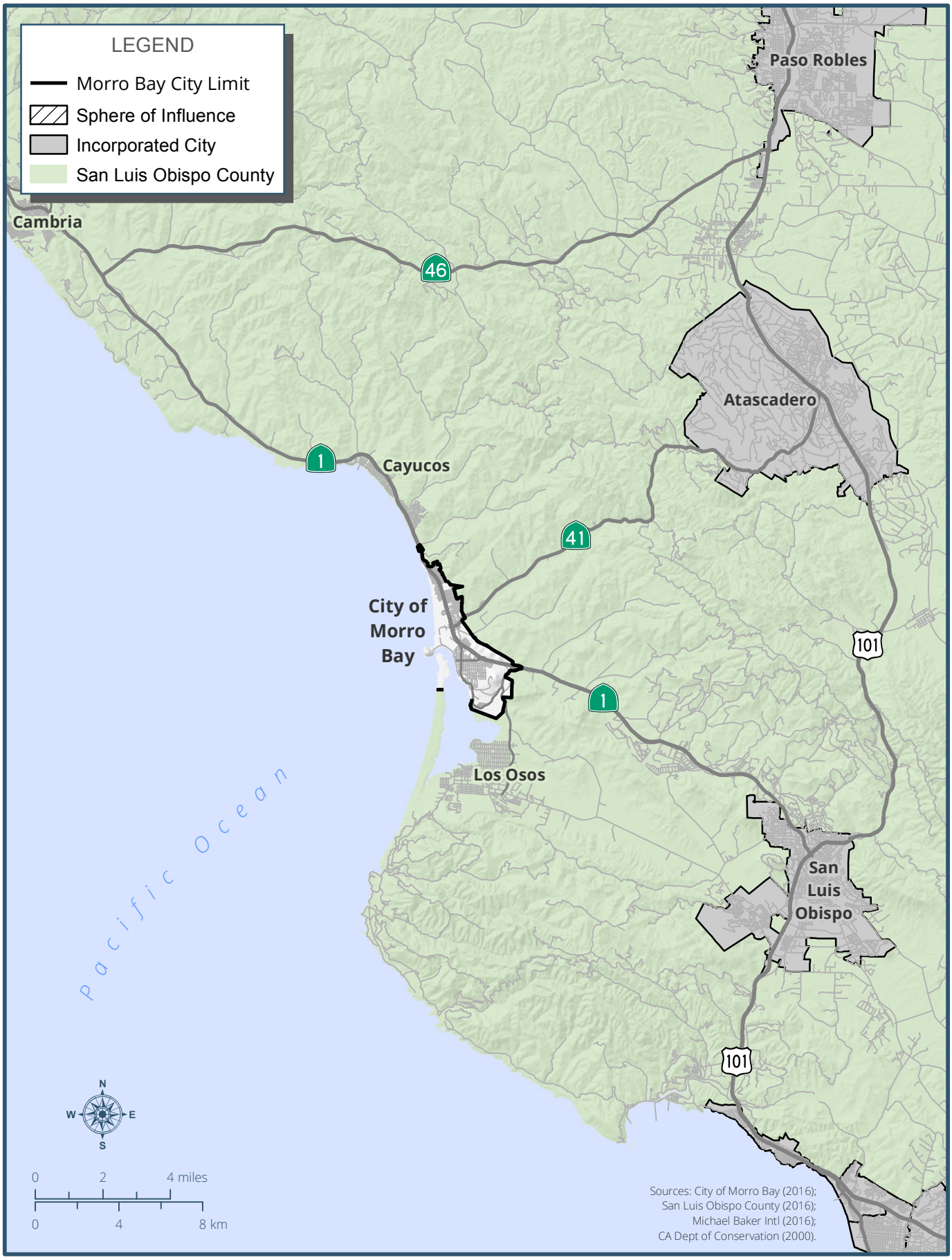


Specifically, the CBA presents a broad review of the available information about historical and existing conditions in and adjacent to the City of Morro Bay and summarizes the background information required to update the City's General Plan and Local Coastal Program. This information will also be used to support the Environmental Impact Report prepared for the General Plan and Local Coastal Program pursuant to the California Environmental Quality Act. The CBA does not, however, provide recommendations, goals, policies, or actions.

The data and information in the CBA reflect the best available understanding of existing and historical conditions as of June 2016.

1.3 PLANNING AREA

The City of Morro Bay is located on the central coast of California, approximately 13 miles northwest of the City of San Luis Obispo. The total area of the city is just over 10 square miles, with approximately 5.3 square miles of land, and 5 square miles of water. The community of Cayucos is located to the north, and the community of Los Osos is located to the south, with a buffer of undeveloped land directly bordering Morro Bay on the north, east, and south, and the Pacific Ocean on the west. Figure 1.2 illustrates the city's location.



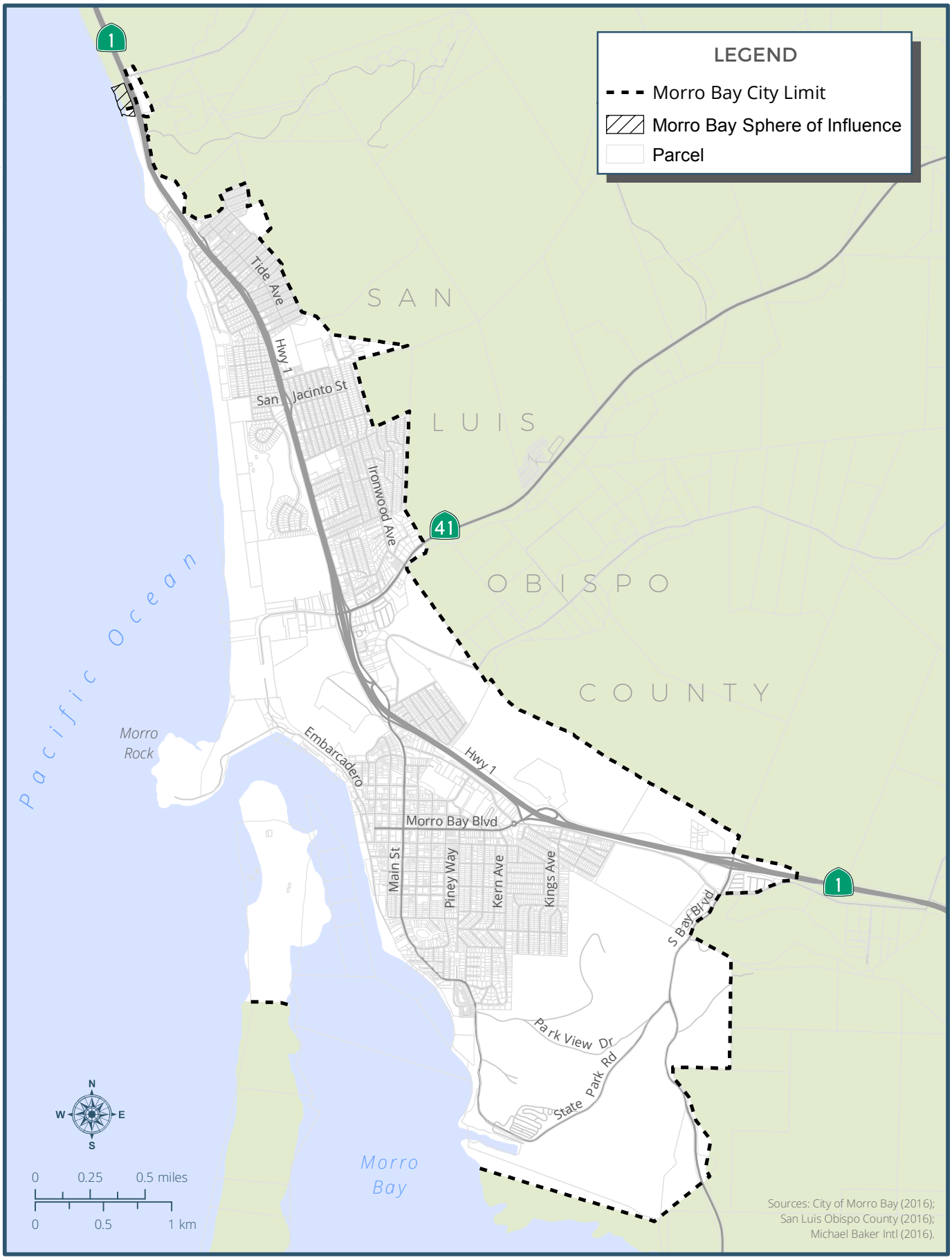
T:_GIS\San_Luis_Obispo_County\MXDs\Morro Bay\General_Plan_Update\CBA\Figure 1.2 Vicinity Map.mxd (7/25/2017)

Plan MORRO BAY

FIGURE 1.2

Vicinity Map

Page 2



Plan MORRO BAY

FIGURE 1.3

Planning Area

Page 2

The City of Morro Bay planning area includes lands within the city limits and surrounding areas, including the sphere of influence, that have a bearing on future planning decisions in Morro Bay. Figure 1-3 identifies the planning area.

1.4 ORGANIZATION OF THE COMMUNITY BASELINE ASSESSMENT

The CBA is organized into 15 chapters as described below. Generally, each chapter is organized to (1) provide a brief introduction, (2) discuss existing conditions, (3) identify federal, state, and local regulations related to the chapter topic, and (4) summarize priority findings. The CBA is complemented by the CVRA, which is provided under separate cover. The chapters are organized alphabetically; chapter topics respond to the topics identified in the California Environmental Quality Act (CEQA), as well as state law related to the General Plan and the California Coastal Act.

- Chapter 1.0, Introduction, describes the role of the CBA relative to the pertinent elements, details the organization of the report, and describes the range of the planning area.

- Chapter 2.0, Air Quality and Greenhouse Gas Emissions, provides information about air quality in and adjacent to the planning area, as well as a greenhouse gas emissions inventory that occurred as the result of activity in the City of Morro Bay in 2015.

- Chapter 3.0, Coastal Resilience, identifies coastal hazards for present day, as well as how they are expected to be influenced by sea level rise through 2030, 2050, and 2100. The chapter also identifies assets in the planning area that could be affected by coastal hazards in 2016, 2030, 2050, and 2100.

- Chapter 4.0, Cultural, Paleontological, and Mineral Resources, describes historical inhabitants, as well as cultural and paleontological artifacts that may exist in the planning area.

- Chapter 5.0, Economic Conditions and Market Trends, identifies the existing retail inventory, demarcates and describes the city's trade area, and describes market segments in the planning area.

- Chapter 6.0, Infrastructure and Public Services, provides an overview of the services, service providers, and physical infrastructure that exist in the planning area.

- Chapter 7.0, Land Use, Community Form, and Coastal Uses, explains how land use is currently regulated, existing land uses, and priority coastal uses in the planning area.

- Chapter 8.0, Natural and Environmental Hazards, describes the natural and human hazards that could occur in the planning area and the assets they could affect.

- Chapter 9.0, Natural Resources, discusses plant, animal, and habitat conditions in the planning area.

- Chapter 10.0, Noise, identifies existing noise conditions in the planning area.

- Chapter 11.0, Parks, Recreation, and Open Space, provides an overview of recreational assets and programs, open space areas, and coastal access points.

- Chapter 12.0, Shoreline Management and Protection, discusses existing shoreline protection devices and issues related to erosion.

- Chapter 13.0, Transportation and Mobility, describes automobile and active transportation conditions in the planning area.

- Chapter 14.0, Water and Water Quality, describes watershed conditions, as well as water quality issues related to stormwater runoff.

- Chapter 15.0, References, contains a list of references and citations from each chapter.

2.0 Air Quality & Greenhouse Gas Emissions

Plan MORRO BAY

2.0 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This chapter identifies existing air quality and greenhouse gas (GHG) emissions conditions in the planning area and provides a discussion of how those conditions would reasonably be expected to change given projected population, economic, and environmental conditions. This chapter also summarizes applicable regulations for air quality levels and GHG emissions reductions.

2.1 EXISTING CONDITIONS

AIR QUALITY

Climate and Atmospheric Conditions

The City of Morro Bay is located in San Luis Obispo County and is within the South Central Coast Air Basin (SCCAB), which includes all of San Luis Obispo, Santa Barbara, and Ventura Counties. The San Luis Obispo County Air Pollution Control District (SLOAPCD) is responsible for managing air quality within the San Luis Obispo County portion of the SCCAB. For geography, climate, and meteorology, the county can be divided into three general regions: Coastal Plateau, Upper Salinas River Valley, and East County Plain. Morro Bay is located in the Coastal Plateau which covers the areas of the county immediately inland from the Pacific Ocean. The Coastal Plateau includes about 75 percent of the county's population and development, and yields higher levels of air pollutants as a result. The City of Morro Bay ranges in elevation from sea level to about 600 feet, and is bounded to the northeast by the foothills of the Santa Lucia Mountains.

The climate of Morro Bay and all of the SCCAB is strongly influenced by proximity to the Pacific Ocean and the location of the semi-permanent high-pressure cell in the northeastern Pacific. The Mediterranean climate of the region produces moderate average temperatures with rainfall concentrated in the winter months.

The SCCAB is subject to seasonal Santa Ana winds. Santa Ana winds are strong northerly to northeasterly winds that originate from high-pressure areas centered over the desert of the Great Basin. These warm, dry winds usually blow offshore at 15 to 20 miles per hour (mph), but can reach speeds in excess of 60 mph. Santa Ana winds are particularly strong in the mountain passes and at the mouths of canyons. Airflow around the county plays an important role in the movement and dispersion of pollutants. The speed and direction of local onshore winds, which occur frequently throughout the year, are controlled by the location and strength of the Pacific high pressure system and other global weather patterns, topographical factors, and circulation patterns that result from temperature differences between the land and the sea.

Two types of temperature inversions (warmer air on top of cooler air) are created in the SCCAB: subsidence and radiation. The subsidence inversion is a regional effect created by the Pacific high-pressure area in which air is heated as it is compressed when it flows from the high-pressure area to the low-pressure areas inland. This type of inversion generally forms at about 1,000 to 2,000 feet and can occur throughout the year, but is most evident during the summer months. Radiational, or surface, inversions are formed by the more rapid cooling of air near the ground at night, especially during winter. This type of inversion is typically lower and is generally accompanied by stable air. Both types of inversions limit the dispersal of air pollutants in the regional airshed. The more stable the air (low wind speeds, uniform temperatures), the lower the amount of pollutant dispersion.

Characteristics of Air Pollution

In general, air pollution is the introduction of harmful particles or molecules into the atmosphere. Air pollutants can cause harm to humans, animals, and plants that breathe in or absorb these materials. The amount of harm depends on the type and concentration of the pollutant. The following describes common air pollutants found in the Morro Bay planning area.

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NOX) and reactive organic gases (ROG). NOX are formed during the

combustion of fuels, and ROG are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and those who exercise strenuously outdoors.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas. The major source of CO in California is automobile exhaust from internal combustion engines. Elevated concentrations are, therefore, usually only found near areas of high traffic volumes. The health effects associated with CO are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing impaired mental abilities and heart difficulties in people with chronic diseases.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of fossil fuel combustion, with the primary sources being motor vehicles and industrial boilers and furnaces. NO_2 forms when nitric oxide (NO), produced by the burning of fossil fuels, reacts with oxygen in the air. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of particulate matter and acid rain.

Particulate Matter

PM_{10} is particulate matter measuring no more than 10 microns in diameter, and $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates, and sulfates. PM_{10} and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those

between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and remain there. It poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. Particulate matter can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of absorbed toxic substances (CARB 2016a).

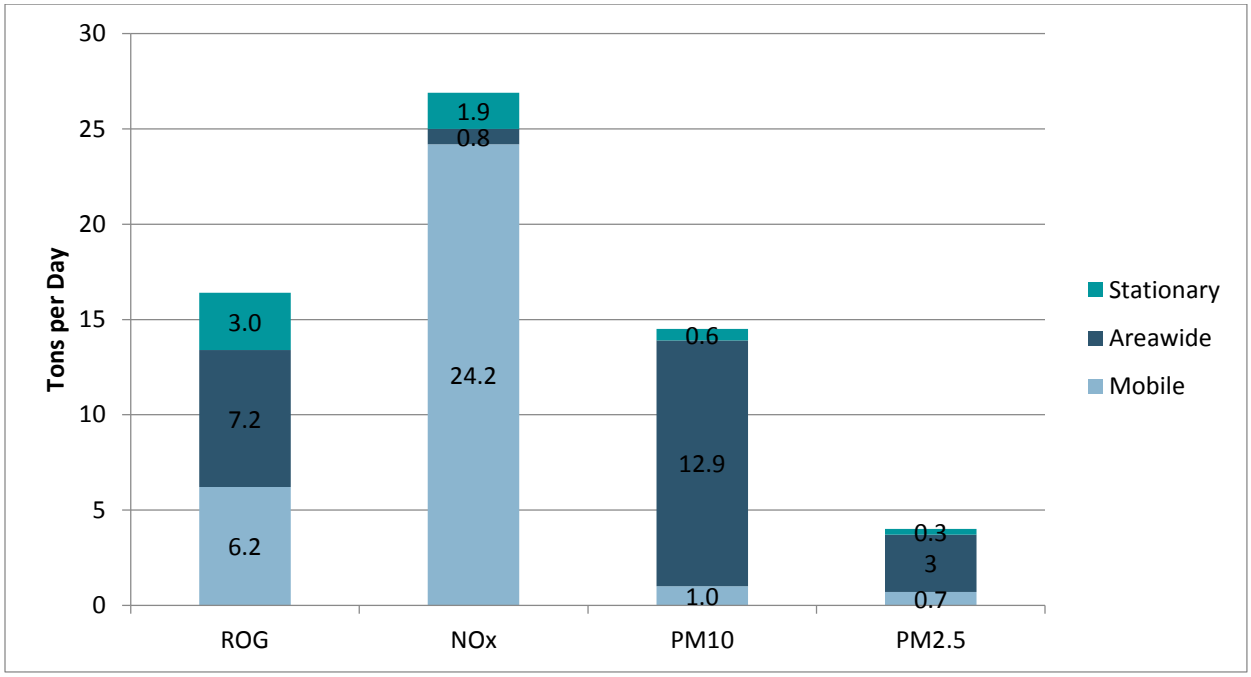
Existing Pollution Sources

Criteria Pollutants

Major sources of air polluting emissions include stationary, mobile, and area-wide sources. Stationary sources include fixed (nonmobile) sources such as dry cleaning equipment, petroleum processing and production facilities, commercial and industrial boilers, and surface coating facilities and operations. Existing operational, stationary sources in Morro Bay include a dry cleaning business, gasoline service stations, and auto body shops. Industrial developments, such as the long-time operating Dynegy power plant and Chevron oil tanker loading terminal, have been retired in recent years and are no longer sources of air pollutant emissions. Mobile sources include vehicles of transport including ships, airplanes, trains, and automobiles. Area-wide sources are point sources spread throughout a region, but considered to be significant when considered collectively. Area-wide sources include residential water heating, consumer products, unpaved roads, and crop tilling.

The California Air Resources Board (CARB) developed an emissions inventory for San Luis Obispo County for 2015 (CARB 2013). The emissions inventory is summarized in Figure 2.1.

Figure 2.1
San Luis Obispo County 2015 Emissions Inventory – Criteria Air Pollutants
(Tons Per Day)



Source: CARB 2013

According to the inventory of criteria pollutants presented in Figure 2.1, mobile sources such as cars and trucks are the largest contributor to the estimated annual average for air pollutant levels of NOX, accounting for approximately 90 percent of total NOX emissions in San Luis Obispo County. Large area-wide sources, such as farming operations, are present in the county and account for approximately 44 percent of ROG, 89 percent of PM_{10}, and 75 percent of $PM_{2.5}$.

Toxic Air Contaminants

Toxic air contaminants (TAC), or hazardous air pollutants (HAP), are regulated in California through the Tanner Air Toxics Act of 1983 (Assembly Bill [AB] 1807) and the Air Toxic Hot Spot Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and adopted the US Environmental Protection Agency's (EPA) list of HAPs as TACs.

The goals of AB 2588 are to collect air toxics emissions data, identify facilities having localized effects, and ascertain the health risks. TACs may include diesel, formaldehyde, benzene, acetaldehyde, and polycyclic aromatic hydrocarbons (PAH). The following eight TAC emitter facilities were identified by CARB in the City of Morro Bay (2016):

- Benedict-Rettey Crematory at 1401 Quintana Road
- Black Mountain Pet Crematorium at 1401 Quintana Road
- Dynegy Morro Bay LLC at 1290 Embarcadero
- Guerra Quarry at 1835 Atascadero Road
- Hanson Aggregates at 180 Atascadero Road
- Mission Linen and Uniform Service at 399 Errol Street
- Morro Bay/Cayucos Wastewater Treatment Facility at 160 Atascadero Road
- US Army Corps of Engineers at Morro Bay Harbor

Other sources of TACs in California include vehicles from freeways and urban roadways with more than 100,000 vehicles per day and from rural roadways with more than 50,000 vehicles per day. However, no such facilities with these traffic volumes are located in Morro Bay.

There is a health risk to sensitive populations from exposure to high levels of TACs. CARB recommends local jurisdictions adopt land use policies to separate sensitive land uses a minimum of 500 to 1,000 feet from air toxic sources. CARB's recommendations for siting new sensitive land uses[1] for both mobile and stationary sources of air toxics are presented in Table 2.1 and published in the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2005). The recommended setbacks are advisory and should not be interpreted as defined "buffer zones." CARB recognizes the opportunity for more detailed site-specific analyses, and acknowledges that land use regulatory agencies must balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

[1] Sensitive land uses are facilities with large numbers of children, pregnant women, elderly persons, and individuals with existing health problems. These individuals are particularly vulnerable to air pollution.

Table 2.1
Recommendations for Siting New Sensitive Land Uses in California

Source Category	Advisory Recommended Setback Distance
Freeways and High-Traffic Roads	500 feet from a freeway or urban road with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	1,000 feet. Avoid location of new sensitive land uses near entry and exit points.
Rail Yards	1,000 feet. Within 1 mile, consider siting limitation and mitigation approaches.
Ports	Immediately downwind. Consult local air district.
Refineries	1,000 feet.
Chrome Platers	1,000 feet.
Dry Cleaners Using Perchloroethylene	300 to 500 feet.
Gasoline Dispensing Facilities	300 feet for facilities with throughput of at least 3.6 million gallons annually, or 500 feet for facilities with a smaller annual throughput.

Source: CARB 2005

The City of Morro Bay contains one dry cleaning facility and multiple gasoline service stations. No other common sources of TACs listed in Table 2.1 are present in Morro Bay.

Odors

The SLOAPCD has identified common types of facilities known to produce odors in the region including, but not limited to, wastewater treatment plants, landfills, composting facilities, petroleum refineries, and chemical manufacturing. Significant odors are generally those that impact a considerable number of people, particularly in residential areas and at sensitive land uses. Since the intensity of an odor's source operations and its proximity to sensitive receptors influences the potential significance of odor emissions, the SLOAPCD has established minimum screening distances for potential odor sources. These are provided in Table 2.2.

Table 2.2
Screening Distances for Potential Odor Sources

Type of Operation	Screening Distance
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Coffee Roaster	1 mile
Composting Facility	1 mile
Fiberglass Manufacturing	1 mile
Food Processing Facility	1 mile
Oil Field	1 mile
Painting/Coating Operations (e.g., auto body shops)	1 mile
Petroleum Refinery	2 miles
Rendering Plant	1 mile
Sanitary Landfill	1 mile
Transfer Station	1 mile
Wastewater Treatment Plant	1 mile

Source: SLOAPCD 2012a

Existing odor sources in the City of Morro Bay include a coffee micro-roaster, multiple auto body shops, and the Morro Bay/Cayucos Wastewater Treatment Plant.

Existing Air Quality

Ambient Monitoring Data

CARB compiles air quality data from a regional air quality monitoring network that provides information on ambient air pollutant concentrations of criteria air pollutants (CARB 2015). Monitored ambient air pollutant concentrations reflect the number and strength of emission sources and the influence of topographical and meteorological factors. Table 2.3 presents a three-year summary of air pollutant data collected at the Morro Bay Station, centrally located in the city at 899 Morro Bay Boulevard. The Morro Bay Station does not record data for particulate matter. PM_{10} and $PM_{2.5}$ data was collected at the San Luis Obispo Station located approximately 13 miles southeast of Morro Bay, which is the next nearest station. As shown in Table 2.3, the state PM_{10} standard was exceeded one time in 2012 and three times in 2013. No other air pollutant exceedances were recorded from 2012 to 2014.

Table 2.3
Summary of Annual Air Quality Data at the Morro Bay and San Luis Obispo Air monitoring stations

Pollutant	2012	2013	2014
Ozone, ppm – Worst Hour	0.059	0.067	0.070
Number of days of state exceedances (>0.09 ppm)	0	0	0
Ozone, ppm – Worst 8 Hours	0.052	0.056	0.066
Number of days of state exceedances (>0.070 ppm)	0	0	0
Number of days of federal exceedances (>0.075 ppm)	0	0	0
Particulate Matter[1] <10 microns, μg/m^3 Worst 24 Hours	51.3	75.6	43.2
Number of samples of state exceedances (>50 μg/m^3)	1	3	0
Number of samples of federal exceedances (>150 μg/m^3)	N/A[2]	N/A[2]	0
Particulate Matter[1] <2.5 microns, μg/m^3 Worst 24 Hours	15.4	19.5	15.6
Number of samples of federal exceedances (>35 μg/m^3)	0	0	0

Source: CARB 2015

[1] Data from San Luis Obispo Station

[2] Data was insufficient to determine the value

Clean Air Act (CAA) Attainment Status

The SLOAPCD monitors air pollutant levels to ensure that air quality standards are met, and if they are not met, develops strategies to meet the standards. Depending on whether or not the standards are met or exceeded, the air basin is classified as being in "attainment" or in "nonattainment."

According to the SLOAPCD's 2014 Annual Air Quality Report, the eastern part of the county is in nonattainment for the federal 8-hour ozone standard while the western portion of the county, which includes the City of Morro Bay, retained its federal ozone attainment status. The county is currently designated attainment for all of the other national air quality standards. In 2014, Morro Bay experienced somewhat higher ozone levels than in the previous year. The available evidence suggests that exceedances of the national standards in the San Luis Obispo County portion of the SCCAB are primarily caused by the transport of ozone and ozone precursors from outside of the county, rather than by emissions originating within the county.

The San Luis Obispo County portion of the SCCAB is also designated as a nonattainment area for the state one-hour and 8-hour ozone standards, as well as the state 24-hour and annual PM_{10} standards. The San Luis Obispo County portion of the SCAAB is currently designated as attaining the state annual $PM_{2.5}$ standard.

Air Quality Trends

The 2001 Clean Air Plan (2001 CAP) is the third update to the 1991 CAP adopted by the SLOAPCD Board in January 1992. The City of Morro Bay did not participate directly in developing the 2001 CAP. However, local land use decisions in Morro Bay affect air quality and air quality trends in the air basin. The 2001 CAP contains several transportation control measures and land use management strategies designed to reduce the air quality impacts of urban development, and the success of many of these measures is dependent on their adoption and implementation by Morro Bay and the other municipal agencies in San Luis Obispo County.

Ongoing implementation of the control measures adopted through the 2001 CAP and previous plans is expected to bring the San Luis Obispo County portion of the SCCAB into attainment of the state ozone standard within a three-year time frame.

San Luis Obispo County is classified as a moderate nonattainment area for the state one-hour and eight-hour ozone standards. The CAA requires that moderate nonattainment areas implement the following control requirements for stationary sources:

- Application of best available control technology, and a district permitting program designed to allow no net increase in emissions of nonattainment pollutants or their precursors from new or modified stationary sources which emit or have the potential to emit 25 tons per year or more of nonattainment pollutants or their precursors. (Health & Safety Code 40918(a) (1)).

- Application of best available retrofit control technology to existing sources which emit 5 tons or more per day, or 250 tons or more per year; application of reasonably available control technology for all other existing emission sources (Health & Safety Code 40918(a)(2)).

- Development of control programs for area sources, such as coatings and solvents (Health & Safety Code 40918(a) (4)).

- Sufficient control strategies to achieve at least a 5 percent per year reduction in both ROG and NOx emissions countywide, averaged every consecutive three-year period (Health & Safety Code 40914). For moderate nonattainment areas where ozone modeling is not performed, CARB has determined that at least a 20 percent total reduction in both pollutants compared to 1991 emissions levels is required.

In addition, in San Luis Obispo County, motor vehicles (mobile sources) account for over 50 percent of the emissions of ROG and NOX. State controls on vehicles and the use of cleaner, alternative fuels will continue to provide significant reductions in vehicle emissions over time. Transportation control measures (TCMs) are controls implemented at the local or regional level to reduce emissions resulting from the use of motor vehicles. TCMs are primarily intended to reduce vehicle use by promoting and facilitating the use of alternative transportation options. In contrast, the vehicle emissions control program implemented by the state reduces emissions through manufacturer's improvements for new motor vehicles. The TCMs described in the 2001 CAP focus on reducing the number of short trips and limiting the growth of vehicle miles traveled to the rate of population increase. Additional long-term reductions are available through implementation of recommended land use planning strategies designed to help reduce dependence on automobiles. Planning documents published by CARB, the Local Government Commission, and others estimate motor vehicle usage can be reduced by 15 percent to 30 percent with implementation of appropriate land use and circulation management programs.

According to the SLOAPCD's Air Quality Trends 1991-2011 (2013), significant improvements in air quality have been observed in most areas of the county over the past 20 years, despite significant increases in population and vehicle miles traveled during that period. Ozone levels have fallen throughout San Luis Obispo County, particularly in the areas with the highest historical concentrations. This has resulted from emissions reductions of ozone precursors, achieved through implementation of control measures adopted under the 2001 CAP. Coastal areas, including the City of Morro Bay, have generally experienced low ozone levels, with state or federal standards only rarely exceeded. While there is no evidence of substantial improvement in these areas during this period, there is no evidence of deterioration, either.

GREENHOUSE GAS EMISSIONS

This section provides an overview of the science, regulations, and existing conditions of GHG emissions in Morro Bay. It explains the contribution of emissions to climate change, potential impacts as a result of these changes, and provides an inventory of Morro Bay community GHG emissions for 2005 and 2015.

Scientific Basis

In the past several decades, a well-scrutinized body of scientific evidence and understanding has led to a general consensus in the scientific community that human activity is changing the earth's climate by increasing the concentration of GHGs in the atmosphere. The term climate change refers to any significant change in climate measurements, such as temperature, precipitation, or wind lasting for an extended period (i.e., a decade or longer).

Our planet's climate system is complex, and some uncertainty is common when trying to understand the nature of the relationship between human activity and climate change. Yet the growing body of scientific evidence surrounding climate change has withstood years of questioning and evaluation. This has led to a recognition and determination that climate change creates a serious risk to human civilization and natural systems (EPA 2016b). The impacts of climate change can disrupt and endanger many aspects of the built and natural world, including coastal infrastructure, human health, energy systems, and natural habitats.

Greenhouse Gases

GHGs are gases that trap heat in the atmosphere, and are of particular interest when it comes to studying climate change. There are seven primary GHGs subject to regulation under California state law, listed below (CARB 2014).

- Carbon Dioxide (CO_2). Carbon dioxide is produced through the burning of fossil fuels, solid waste, and wood products and is generated through certain chemical reactions, such as the manufacture of cement.

- Methane (CH_4). Methane is produced during the production and transportation of fossil fuels, such as coal, natural gas, and oil. It also results from organic decay in landfills, livestock, and other agricultural processes.

- Nitrous Oxide (N_2O). Nitrous oxide is generated during agricultural and industrial activities, combustion of fossil fuels, and solid waste.

- Hydrofluorocarbons (HFCs). HFCs are used as refrigerants in both stationary refrigeration and mobile air conditioning.

- Perfluorocarbons (PFCs). Perfluorocarbons are created as a byproduct of aluminum production and semiconductor manufacturing.

- Sulfur Hexafluoride (SF_6). Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity.

- Nitrogen Trifluoride (NF_3). Although not originally listed in the state's GHG reduction strategy, NF_3 was later added to the list via legislation. Like SF_6, it is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an etchant in microelectronics.

Sources of Greenhouse Gas Emissions

Emissions from human activities have driven the progression of climate change in the last century, with the combustion of fossil fuels being the primary source of human-caused GHGs. ICLEI – Local Governments for Sustainability developed the *U.S. Community Protocol for Accounting and Reporting of GHG Emissions* to establish a national standard for accounting for GHG emissions. By better understanding the sources of emissions, governments and communities can begin to work to reduce them. This protocol focuses on sources of the primary GHG emissions listed above. The primary sources of human-caused GHG emissions are detailed below (ICLEI 2012).

- Built Environment. Homes, businesses, and offices all require energy to operate, especially for heating, cooling, and lighting. When energy generated to power the built environment comes from fossil fuel sources, the GHGs generated can have a significant impact on climate change.

- Transportation and Other Mobile Sources. One of the largest sectors of human-caused emissions nationwide, the fossil fuel combustion required to transport people and goods on a daily basis can have a significant contribution to GHG emissions. On-road passenger vehicles, freight and service vehicles, and transit vehicles like buses and trains all contribute to a community's transportation and mobile source emissions.

- Solid Waste. The operation of landfills, as well as the continued emissions after waste is buried, can create a decades-long source of GHG emissions.

- Wastewater and Water. The generation, transmission, and treatment of water and wastewater can generate emissions. Process emissions from wastewater treatment plants and the operation of septic systems can directly emit GHGs, while the energy used to deliver and treat potable water can be generated by natural gas, oil, or coal.

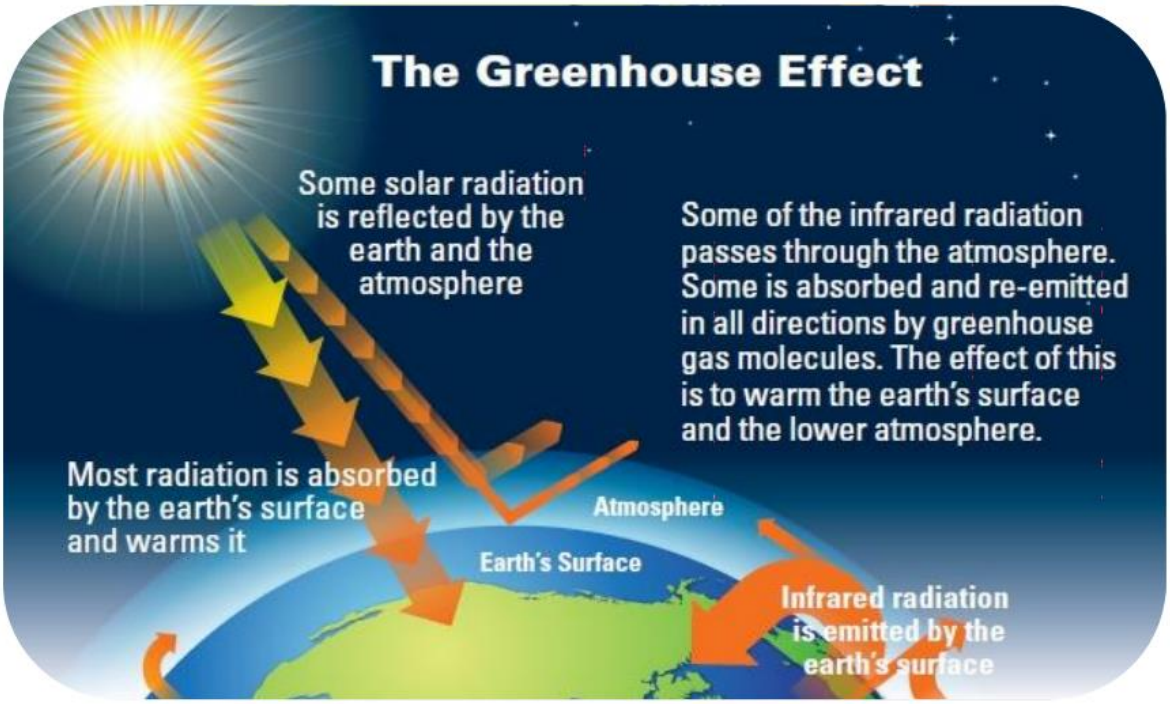
- Agricultural Livestock. These include emissions generated by domesticated animal production, such as the decomposition and treatment of manure.

The Greenhouse Effect

The GHGs described above have always been present in the earth's atmosphere, and are an essential element of supporting life on earth. When solar radiation travels from the sun to the earth, GHGs allow a portion of this heat to remain in the atmosphere by absorbing the solar radiation that has reflected off the surface of the earth. This is called the greenhouse effect, part of an important balancing act of energy entering and leaving the earth's system (Figure 2.2).

Human actions can alter this balance, through changes to land use, increased combustion of fossil fuels, and industrial processes. Anthropogenic activities that increase the amount of GHGs in the earth's atmosphere beyond historic variation can intensify the greenhouse effect, causing serious, lasting changes to our planet's climate. Since pre-industrial times, concentrations of GHGs in the atmosphere have increased substantially, causing earth's temperature to rise. It has been concluded that there is a more than a 90 percent probability that human activities in the last 50 years have caused much of the observed increase in the earth's temperature (NASA 2016).

Figure 2.2
The Greenhouse Effect



Source: NASA 2009

Impacts of Climate Change

As identified in the Morro Bay CAP, increases in the globally averaged atmospheric concentration of GHGs will cause the lower atmosphere to warm, in turn inducing many changes to the global climate system. These changes will have unique and potentially severe impacts in the western United States, California, and in Morro Bay (Morro Bay 2014). Potential impacts in Morro Bay as a result of climate change may include:

- Increased temperatures
- Sea level rise
- Storm surges
- Erosion
- Changed precipitation

These impacts would have serious implications for future development and land use changes, especially along the city's coastline. Considering the worsening impacts of existing hazards in *Plan Morro Bay* will help the City prepare for potentially catastrophic changes to historical climate patterns.

City of Morro Bay Greenhouse Gas Emissions Inventory

An inventory of GHG emissions allows a jurisdiction to estimate the quantity of GHG emissions associated with community activities during a chosen analysis year, providing a snapshot of that city's contribution to climate change. The first year for which a GHG inventory is conducted is typically called the baseline year, and is used to set emissions reduction targets from that year. In California, many local governments have adopted a baseline year between 2005 and 2008.

In 2014, Morro Bay adopted a CAP, which included an inventory analyzing community-wide emissions for a baseline year of 2005. This inventory established a starting point for emissions reductions goals as well as a clearer understanding of community and government activities. Because this was the city's first GHG inventory, the baseline (2005) was the only year analyzed for the CAP. The results of the inventory are summarized below, as is an overview of updates and recommendations for completing a consistent 2015 inventory. The information captured in the 2005 inventory provides a clear overview of historical community activities and future targets, but decisions relating to future land use and development policies should be based on the pending completion of the City's 2015 GHG analysis.

2005 Community-Wide GHG Emissions Sources in Morro Bay

In support of the CAP, the City conducted an inventory of community-wide GHG emissions for calendar year 2005. This inventory analyzed six emissions-generating sectors in the community. Activity data, which measures a key factor that can be used to calculate emissions, is collected for each sector, as summarized in Table 2.4. The 2005 emissions calculated for the City of Morro Bay are shown in Table 2.5. When residential and commercial electricity and natural gas use are combined, energy was the largest source of emissions in Morro Bay, generating 49.5 percent of all GHGs in the community. Transportation was the second largest source, with 40.4 percent of all emissions. All other sectors measured were much smaller sources. Off-road vehicles and equipment, which measures construction and landscaping emissions, was 4.9 percent of all community emissions, while the disposal of solid waste in the community was 4.8 percent. Wastewater, which measures the processing emissions from the City's wastewater treatment plant, was the smallest source of emissions in Morro Bay, with only 0.4 percent of total GHGs.

Table 2.4
Community-Wide Activity Description by Sector, 2005

Sector	Activity Description
Transportation	Vehicle miles traveled, excluding pass-through trips
Residential Energy Use	Residential electricity consumption
	Residential natural gas consumption
Commercial & Industrial Energy Use	Commercial & industrial electricity consumption
	Commercial & industrial natural gas consumption
Off-road Vehicles and Equipment	Emissions from off-road equipment
Solid Waste	Solid waste tonnage sent to landfill from activities in Morro Bay
Wastewater	Methane and nitrous oxide released in the wastewater treatment process

Table 2.5
Community-Wide GHG Emissions by Sector, 2005

Sector	2005	Total GHG Emissions
Transportation	22,506	40.4%
Residential Energy Use	16,094	28.9%
Commercial & Industrial Energy Use	11,442	20.6%
Off-road Vehicles and Equipment	2,740	4.9%
Solid Waste	2,695	4.8%
Wastewater	200	0.4%
Total	55,677	100%

City Government Operations GHG Emissions Sources in Morro Bay

The City's CAP includes a separate inventory examining emissions from municipal actions in 2005. This city government operations inventory allows Morro Bay to better understand its own actions and pursue programs that will allow the City to reduce emissions. This information helps guide effective internal policymaking, but does not have a target that is separate from the overall CAP GHG reduction goal. For the purposes of *Plan Morro Bay*, only the community-wide inventory will be reviewed, updated, and incorporated into the planning process. Table 2.6 shows the distribution of 2005 emissions across different sectors in Morro Bay's government operations.

Table 2.6
City Government Operations GHG Emissions by Sector, 2005 ($MTCO_2e$)

Sector	2005	Percentage of Total GHG Emissions
Wastewater Facilities	451	23.1%
Solid Waste	106	5.4%
Buildings & Facilities	322	16.5%
Vehicle Fleet	355	18.2%
Transit Fleet	113	5.8%
Employee Commute	414	21.2%
Streetlights & Traffic Signals	87	4.5%
Water Delivery	107	5.5%
Total	1,955	100%

Updates to 2005 Community-Wide GHG Emissions Inventory

Climate science is a rapidly developing field, and as a result, best practices in analyzing emissions have improved since 2012 when the baseline inventory update was completed for the year 2005. The 2005 baseline community inventory has been reviewed and updated as follows to ensure consistency with current best practices and allow for comparison to emissions calculations for 2015:

- Waste – The existing inventory uses an older method to determine emissions from solid waste. CARB has developed detailed waste factors that provide the most accurate understanding of waste emissions. The baseline inventory was updated using this source to allow for the most precise understanding of solid waste-related emissions. Additionally, a portion of the 2005 waste has been split out to show details about the tons of alternative daily cover (ADC) disposed. This allows more granularity in analyzing waste emissions.

- Off-Road Vehicles – The original 2005 inventory included industrial and light commercial equipment, as well as agricultural equipment, in the analysis of off-road vehicles. Standard protocol suggests that cities are accountable for construction equipment and lawn and garden equipment in the off-road sector, as these are the emissions most readily impacted by the City's municipal code. As a result, this sector now includes emissions from construction and lawn and garden off-road vehicles only. Additionally, the indicator to determine

construction emissions has been changed from construction and mining jobs to building permits, which provides more precise year-by-year understanding of construction activity.

- Water and Wastewater – Only direct emissions from wastewater treatment processes were included in the 2005 inventory. Because of the energy intensity of transporting and treating water, indirect emissions from the electricity used to power these processes were included in this baseline update. The process with which the 2005 wastewater direct emissions were calculated has also been updated to include more granular assessment of methane and nitrogen dioxide.

- Households – The California Department of Finance (DOF) maintains decades of records on population and households in cities and counties across the state. While this data source has been used across all inventories for Morro Bay, it was found that the original 2005 baseline used a DOF figure for households that has since been updated by the department. To ensure a consistent, reliable baseline for this and other future updates, the number was updated to use the best available data. This change will be reflected in the lawn and garden equipment emissions analysis, which uses percentage of countywide households in the jurisdiction to allocate GHGs. Additionally, this will ensure forecasting efforts will use the best available information from 2005 to estimate emissions for future years.

- Global Warming Potentials (GWP) – The Intergovernmental Panel on Climate Change (IPCC) compiles the findings from the best climate scientists to refine understanding of how different pollutants impact climate change. The 2005 inventory uses 2nd Assessment Report GWPs, which were originally published in 1995. The inventory has been updated to use 5th Assessment Report GWPs, released in 2014. This will ensure that the emissions found in the 2015 inventory will be directly comparable to the baseline year. This update is described in further detail below.

Carbon dioxide is the most prolific GHG, and is used as a reference point for measuring the GWP of other GHGs. To measure the collective impacts of GHGs, these GWPs are used to convert emissions into metric tons of carbon dioxide equivalent (CO_2e) units. As shown in Table 2.7, other gases such as methane and nitrous oxide are more potent than carbon dioxide, meaning they are more effective at trapping heat in the atmosphere and thus have a higher GWP.

Table 2.7
Greenhouse Gases Global Warming Potentials

Gas	Source Activity	IPCC 2nd Assessment Report GWPs	IPCC 5th Assessment Report GWPs
Carbon Dioxide (CO_2)	Combustion	1	1
Methane (CH_4)	Combustion, anaerobic decomposition of organic waste, livestock, agriculture	21	28
Nitrous Oxide (N_2O)	Combustion, wastewater treatment	310	265

Note: GWPs are determined using a 100-year GWP time horizon.

The updates to the 2005 inventory led to a 1,000 $MTCO_2e$ increase in calculated total emissions released in the baseline year. This increase represents the addition of certain sectors, such as indirect emissions from electricity used in water and wastewater processes, as well as changes in emissions from enhanced understanding of GWPs. These changes in activity data and emissions from the 2005 baseline inventory to the updated 2005 inventory are detailed in Table 2.8 and Table 2.9. Aside from new sectors added, the largest increase in emissions between the two baseline years was in the solid waste sector, which due to the increased global warming potential factor used for methane and a more detailed method for calculating emissions over the time of decomposition, increased 57 percent. A summary of sector level changes can be found in Figure 2.3.

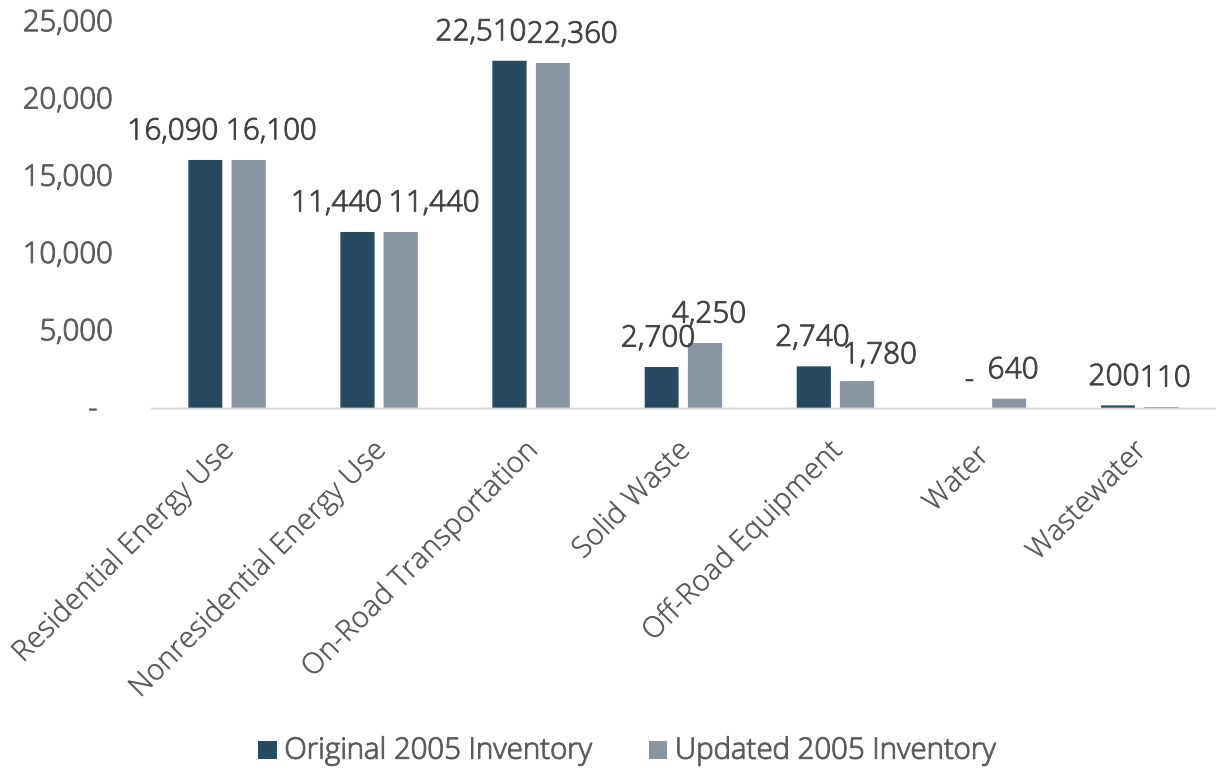
Table 2.8
2005 Baseline Inventory Updates – Changes to Activity Data

Sector	Subsector	Original 2005 Inventory	Updated 2005 Inventory	Unit of Measure	Percent Change
Residential Energy Use	Residential electricity use	24,057,120	24,057,120	kWh	0%
	Residential natural gas	2,013,280	2,013,280	Therms	0%
Nonresidential Energy Use	Nonresidential electricity use	29,121,090	29,121,090	kWh	0%
	Nonresidential natural gas	925,510	925,510	Therms	0%
On-Road Transportation	On-road passenger vehicles	48,897,510	48,897,510	VMT	0%
Solid Waste Disposal	Solid waste disposal	9,240	9,170	Tons of waste	-1%
	Alternative daily cover used for MSW	-	60	Tons of waste	100%
	Solid waste incineration	-	-	Tons of waste	0%
Off-Road Equipment	Lawn & garden	370	400	$MTCO_2e$	8%
	Construction	1,760	1,380	$MTCO_2e$	-22%
	Industrial equipment	40	-		-100%
	Light commercial equipment	360	-		-100%
	Agricultural equipment	210	-		-100%
Water	Indirect water emissions	-	2,862,950	Electricity (kWh)	100%
Wastewater	Direct emissions	200	40	$MTCO_2e$	-80%
	Indirect electricity	-	319,340	Electricity (kWh)	100%

Table 2.9
2005 Baseline Inventory Updates – Changes to Emissions ($MTCO_2e$)

Sector	Subsector	Original 2005 Inventory	Updated 2005 Inventory	Percent Change
Residential Energy Use	Residential electricity use	5,380	5,380	0%
	Residential natural gas	10,710	10,720	0%
Nonresidential Energy Use	Nonresidential electricity use	6,510	6,510	0%
	Nonresidential natural gas	4,930	4,930	0%
On-Road Transportation	On-road passenger vehicles	22,510	22,360	-1%
Solid Waste Disposal	Solid waste disposal	2,700	4,230	57%
	Alternative daily cover used for MSW	-	20	100%
	Solid waste incineration	-	-	0%
Off-Road Equipment	Lawn & garden	370	400	8%
	Construction	1,760	1,380	-22%
	Industrial equipment	40	-	-100%
	Light commercial equipment	360	-	-100%
	Agricultural equipment	210	-	-100%
Water	Indirect water emissions	-	640	100%
Wastewater	Direct emissions	200	40	-80%
	Indirect electricity	-	70	100%
Total		55,680	56,680	2%

Figure 2.3
Summary of 2005 Baseline Inventory Updates ($MTCO_2e$)



2015 Community-Wide GHG Emissions Inventory

A comprehensive community-wide inventory for 2015 was be completed using the same protocol applied to the 2005 inventory. This provides an understanding of GHG emissions-producing community activity in the 10 years since the 2005 baseline inventory, and provides an assessment of Morro Bay's progress toward the GHG reduction goals established by its CAP.

As identified in Tables 2.10 and 2.11, between 2005 and 2015, reductions occurred across the entire energy sector. The decrease observed in the nonresidential electricity use sector exceeds those anticipated in a normal growth scenario. A breakdown of nonresidential electricity use by commercial sector has been requested from PG&E, which will allow additional clarity around this decrease and allow for more granular assumptions about energy use trends to be made in future forecasts.

Solid waste and transportation are the only sectors that saw increases in emissions. Solid waste increases likely occurred as the result of an increase in green and compostable waste being diverted to San Luis Obispo Integrated Waste Authority landfills.

The transportation sector saw a roughly 7 percent increase in vehicle miles traveled (VMT) between 2005 and 2015. VMT is calculated using all trips that occur entirely within Morro Bay and 50 percent of trips that start in Morro Bay and end somewhere in San Luis Obispo County, or vice versa. It should be noted that additional VMT (those that occur from trips that start in Morro Bay and end outside of San Luis Obispo County, or vice versa) have been estimated in support of *Plan Morro Bay*. This modeling ability was not available when the 2005 inventory was completed, and is therefore not included in the 2015 inventory update. Additional changes to the SLOCOG transportation model may account for some of the variation between 2005 and 2015 VMT estimates. A complete description of the VMT modeling method is included in Chapter 13, Transportation and Mobility.

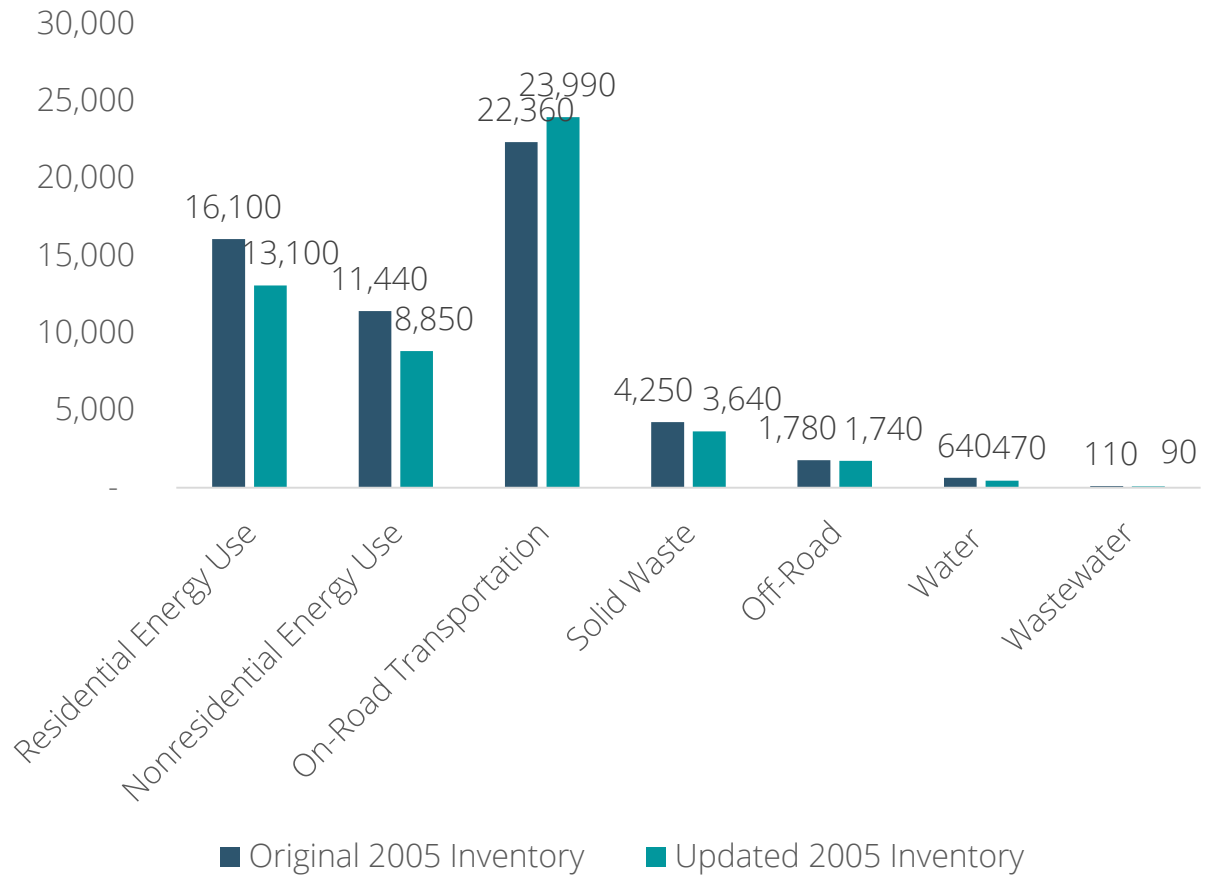
Table 2.10
2005 to 2015 – Changes to Activity Data

Sector	Subsector	2005	2015	Unit of Measure	Percent Change
Residential Energy Use	Residential electricity use	24,057,120	23,084,560	kWh	-4%
	Residential natural gas	2,013,280	1,609,320	Therms	-20%
Nonresidential Energy Use	Nonresidential electricity use	29,121,090	22,486,020	kWh	-23%
	Nonresidential natural gas	925,510	833,840	Therms	-10%
On-Road Transportation	On-road passenger vehicles	48,897,510	52,467,790	VMT	7%
Solid Waste Disposal	Solid waste disposal	9,170	7,720	Tons of waste	-16%
	Alternative daily cover used for MSW	60	210	Tons of waste	250%
	Solid waste incineration	-	-	Tons of waste	0%
Off-Road Equipment	Lawn & garden	400	390	$MTCO_2e$	-3%
	Construction	1,380	1,350	$MTCO_2e$	-2%
Water	Indirect water emissions	2,862,950	2,416,170	Electricity (kWh)	-16%
Wastewater	Direct emissions	40	40	$MTCO_2e$	0%
	Indirect electricity	319,340	269,500	Electricity (kWh)	-16%

Table 2.11
2005 to 2015 – Changes in Emissions ($MTCO_2e$)

Sector	Subsector	2005	2015	Percent Change
Residential Energy Use	Residential electricity use	5,380	4,530	-16%
	Residential natural gas	10,720	8,570	-20%
Nonresidential Energy Use	Nonresidential electricity use	6,510	4,410	-32%
	Nonresidential natural gas	4,930	4,440	-10%
On-Road Transportation	On-road passenger vehicles	22,360	23,990	7%
Solid Waste Disposal	Solid waste disposal	4,230	3,560	-16%
	Alternative daily cover used for MSW	20	80	300%
	Solid waste incineration	-	-	0%
Off-Road Equipment	Lawn & garden	400	390	-3%
	Construction	1,380	1,350	-2%
Water	Indirect water emissions	640	470	-27%
Wastewater	Direct emissions	40	40	0%
	Indirect electricity	70	50	-29%
Total		56,680	51,880	-8%

Figure 2.4
Summary of Emissions, 2005 to 2015 ($MTCO_2e$)



Progress to GHG Reduction Targets

The City of Morro Bay CAP, adopted in 2014, established a GHG reduction target of 15 percent below the baseline year's (2005) emissions. Using the updated 2005 inventory of 56,680 $MTCO_2e$, this equates to a reduction of 8,500 $MTCO_2e$ to reach a 2020 emissions level of 48,180 (Figure 2.5). The 2015 inventory revealed a decrease of 4,800 $MTCO_2e$ since 2005, a reduction of 8 percent from baseline (Figure 2.6). To reach the City's GHG reduction targets as established by the CAP, Morro Bay will need to reduce an additional 3,700 $MTCO_2e$ by 2020.

Figure 2.5
Progress to CAP GHG Emission Reduction Targets ($MTCO_2e$)

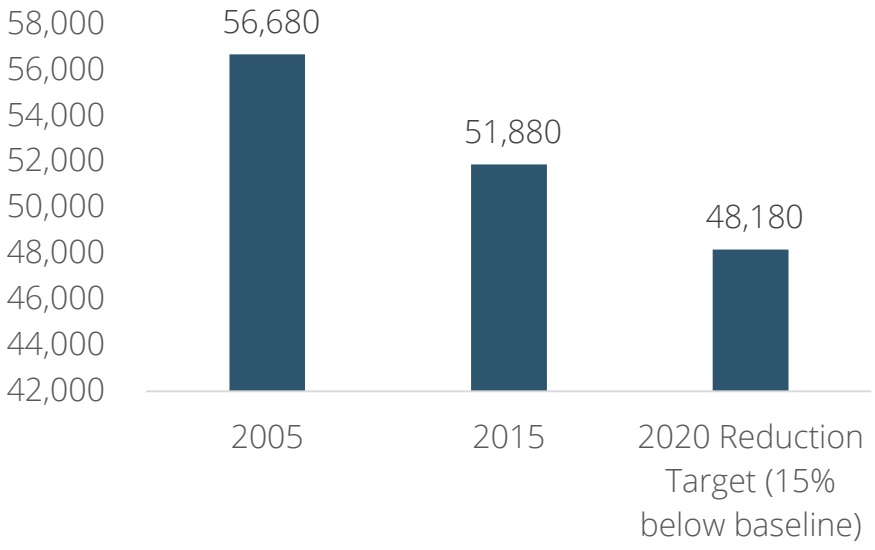
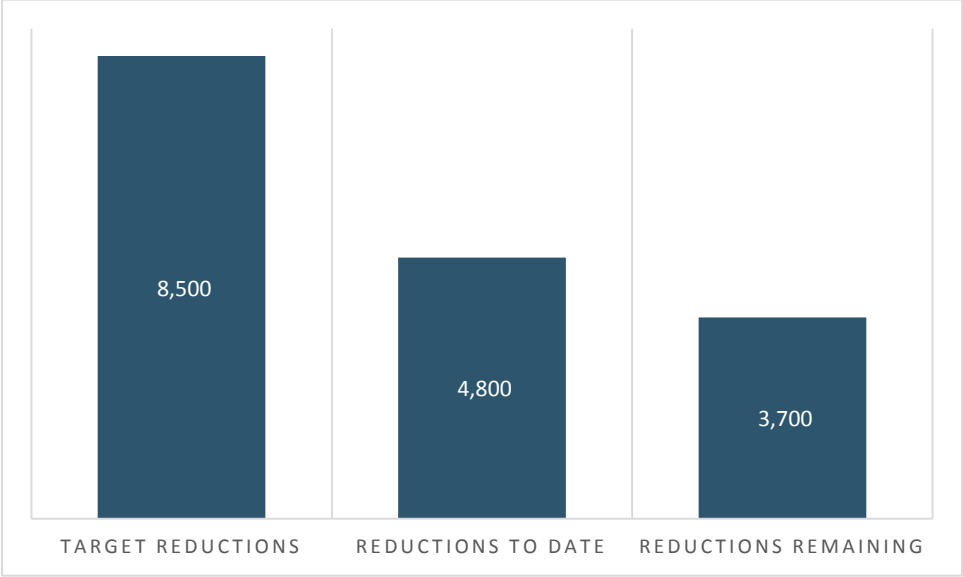


Figure 2.6
GHG Emission Reductions Remaining ($MTCO_2e$)



2.2 REGULATORY SETTING

AIR QUALITY

Federal

Clean Air Act

The CAA is the comprehensive federal law that regulates air emissions from stationary and mobile sources in order to control air pollution in the United States. Under the CAA, the EPA establishes limits on six criteria pollutants through the National Ambient Air Quality Standards (NAAQS). Table 2.12 lists the current federal and state standards for these criteria pollutants. Standards are set to protect public health and public welfare. The CAA also gives the EPA the authority to limit emissions of air pollutants coming from sources like chemical plants, utilities, and steel mills. Individual states or tribes are allowed to have stronger air pollution laws, but they may not have weaker pollution limits than those set by EPA. Under the law, states have to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the CAA.

Table 2.12
Current Federal and State Ambient Air Quality Attainment Standards

Pollutant	Federal Standard	California Standard
Ozone	0.07 ppm (8-hr avg)	0.09 ppm (1-hr avg) 0.07 ppm (8-hr avg)
Carbon Monoxide	9.0 ppm (8-hr avg) 35.0 ppm (1-hr avg)	9.0 ppm (8-hr avg) 20.0 ppm (1-hr avg)
Nitrogen Dioxide	0.100 ppm (1-hr avg) 0.053 ppm (annual avg)	0.18 ppm (1-hr avg) 0.03 ppm (annual avg)
Sulfur Dioxide	0.075 ppm (1-hr avg)	0.25 ppm (1-hr avg) 0.04 ppm (24-hr avg)
Lead	0.15 µg/m3 (3-mo avg)	1.5 µg/m3 (30-day avg)
Particulate Matter (PM10)	150 µg/m3 (24-hr avg)	50 µg/m3 (24-hr avg) 20 µg/m3 (annual avg)
Particulate Matter (PM2.5)	12 µg/m3 (annual avg) 35 µg/m3 (24-hr avg)	12 µg/m3 (annual avg)

ppm= parts per million µg/m3 = micrograms per cubic meter
Source: CARB 2015

State

California Air Resources Board

In California, CARB is responsible for preparing and enforcing the federally required SIP in an effort to achieve and maintain NAAQS and State Ambient Air Quality Standards (SAAQS), which were developed as part of the California CAA adopted in 1988. California air quality standards are identical to or stricter than federal standards for all criteria pollutants. California has also set ambient standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The SAAQS are listed in Table 2.12.

CARB is responsible for assigning air basin attainment and nonattainment designations in California. Air basins are designated as being in attainment if the concentrations of a criteria air pollutant meet or are less than the SAAQS for the pollutant. Air basins are designated as being in nonattainment if the level of a criteria air pollutant is higher than the SAAQS. CARB is the oversight agency responsible for regulating statewide air quality, but implementation and administration of SAAQS is delegated to the regional air pollution control districts. These districts have been created for specific air basins and have principal responsibility for developing plans to meet SAAQS and NAAQS; developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain SAAQS and NAAQS; implementing permit programs established for the construction, modification, and operation of air pollution sources; enforcing air pollution statutes and regulations governing non-vehicular sources; and developing employer-based trip reduction programs.

Local

San Luis Obispo County Air Pollution Control District (SLOAPCD)

The SLOAPCD regulates air quality in the San Luis Obispo County portion of the SCCAB, and is responsible for attainment planning related to criteria air pollutants, and for district rule development and enforcement. Under state law, the SLOAPCD is required to prepare an overall plan for air quality improvement for the SCCAB (the 2001 CAP described above). As a means to help implement the 2001 CAP, SLOAPCD has created

and maintains an Air Quality CEQA Handbook (last updated in 2012) which establishes significance thresholds for various air pollutants.

GREENHOUSE GAS EMISSIONS

Federal

Clean Air Act

In 2007, the US Supreme Court held that the EPA has the statutory authority to regulate GHG emissions from the transportation sector. After the court decision, President Obama signed Executive Order 13432 directing the EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responded to the Supreme Court's decision.

In December 2007, the president signed the Energy Independence and Security Act of 2007, which sets a mandatory renewable fuel standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022 and sets a national fuel economy standard of 35 miles per gallon by 2020. The act also contains provisions for energy efficiency in lighting and appliances and for the implementation of green building technologies in federal buildings.

On July 11, 2008, the EPA issued an Advance Notice of Proposed Rulemaking on regulating GHGs under the CAA. The Advance Notice of Proposed Rulemaking reviews the various CAA provisions that may be applicable to the regulation of GHGs, presents potential regulatory approaches and technologies for reducing GHG emissions, and seeks further public comment on the regulation of GHG emissions under the CAA.

Mandatory Reporting Rule

In 2009, the EPA adopted a mandatory GHG reporting rule for suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions. These businesses and facilities began submitting annual reports to the EPA in 2011 (covering the 2010 calendar year emission). Vehicle and engine manufacturers began reporting GHG emissions for model year 2011.

Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act

In 2009, the EPA administrator issued a final endangerment finding and final cause finding for light duty vehicles under section 202(a) of the CAA. The findings include:

- Endangerment finding: The EPA found that current and projected concentrations of GHG emissions in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or contribute finding: The EPA found that the combined emissions of GHGs from new motor vehicles contribute to the GHG pollution which threatens public health and welfare.

These findings do not impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing the EPA's proposed GHG emission standards for light-duty vehicles, which were jointly proposed by the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA).

On April 1, 2012, the EPA and NHTSA issued final rules requiring that by the 2016 model year, manufacturers must achieve a combined average vehicle emission level of 250 grams of CO_2 per mile, which is equivalent to 35.5 miles per gallon as measured by EPA standards.

State

California has served as a national and global leader in developing a regulatory framework to address the causes and impacts of climate change. The state has adopted a number of policies, programs, and regulations that set targets for GHG emission reductions, which have guided actions across all levels of government. The following section describes the central state-level initiatives that influence the reduction of GHGs in Morro Bay.

Executive Order S-3-05

In 2005, the governor established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010, 1990 levels by 2020, and 80

percent below 1990 levels by 2050. The secretary of the California EPA is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the secretary of the Business, Transportation and Housing Agency, the secretary of the Department of Food and Agriculture, the secretary of the Resources Agency, the chairperson of CARB, the chairperson of the California Energy Commission, and the president of the Public Utilities Commission.

Global Warming Solutions Act – Assembly Bill 32

After the governor signed Executive Order S-3-05, the California legislature followed by passing AB 32 in 2006, the Global Warming Solutions Act. AB 32 directed CARB to develop the rules and regulations necessary to achieve the GHG emissions reduction targets. AB 32 was the first statewide program to limit GHG emissions. Key steps included:

- 2007 – Identifying initial GHG emission-reduction measures.
- 2008 – Calculating the 1990 baseline GHG emissions levels and receiving approval of a statewide limit equivalent to that level. Adopting reporting and verification standards and requirements concerning GHG emissions.
- 2009 – Adopting a scoping plan to reduce GHG emissions.
- 2010 – Adopting and enforcing regulations to implement the actions.
- 2011 – Adopting GHG emission limits and reduction measures.
- 2012 – Enforcing GHG emission limits and reduction measures (CARB 2014).

California Climate Change Scoping Plan

In 2008, CARB approved the California Climate Change Scoping Plan (Scoping Plan), which contains the primary strategies California will use to reduce the GHG emissions that cause climate change. The Scoping Plan outlines a combination of policies, programs, and practices needed to reduce statewide emissions by 15 percent below current levels (the equivalent of 1990 levels) by 2020. Given projected trends, this would be approximately 30 percent below business-as-usual levels anticipated for

2020. Effectively, the Scoping Plan establishes a statewide carbon budget that will allow the state to grow while still meeting its emissions reduction targets. The Scoping Plan strategies include energy efficiency measures, regional transportation-related GHG emissions targets, a renewable portfolio standard, a cap-and-trade program, a light duty vehicle GHG standard, and a low carbon fuel standard.

The Scoping Plan recognizes the essential partnership between state, regional, and local governments to reduce GHG emissions. Local governments have authority over activities that produce both direct and indirect GHG emissions through land use planning and zoning, general permitting, local ordinances, and municipal operations. Therefore, many of the strategies outlined in the Scoping Plan need local governments to take action. The Scoping Plan also encourages local governments to inventory GHG emissions, adopt GHG emissions reduction targets, and develop local action plans to lower emissions. The continued re-inventory of Morro Bay's GHG emissions will continue to serve these purposes.

The first update to the Scoping Plan was approved on May 22, 2014. This update builds upon the initial scoping plan with new strategies and recommendations and identifies funding opportunities to drive GHG emissions reductions. It provides a status update of scoping plan measures and establishes climate change priorities through 2019, setting the groundwork to achieve the state's 2020 GHG emissions reduction target. CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target established by Executive Order B-30-15 (see below).

CEQA and Greenhouse Gas Emissions – Senate Bill 97

In 2007, the state legislature enacted Senate Bill (SB) 97, which directed the California Office of Planning and Research (OPR) to develop guidelines that help local governments reduce GHG emissions under CEQA. OPR created guidance related to analysis of GHG emissions in CEQA documents and recommended that the lead agency determine the significance of those impacts and enact measures to reduce emissions to a less than significant level. The California Natural Resources Agency (2014) adopted formal CEQA guideline amendments in 2009.

Low Carbon Fuel Standard

Executive Order S-1-07 establishes a Low Carbon Fuel Standard (LCFS) for transportation fuels in California, which CARB included in the Scoping Plan (CARB 2016e). The executive order requires that the carbon intensity of California's transportation fuels be reduced by at least 10 percent by 2020. Implementation of the LCFS is expected to achieve the minimum 10 percent reduction goal. In May 2014, supplemental information for the 2013 reports for residential and public electric vehicle charging was posted to the CARB website. In June 2014, CARB extended the deadline for the submission of alternatives relating to economic impacts in the LCFS Standardized Regulatory Impact Analysis and CEQA.

California Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS), established in 2002 by SB 1078 (Sher, Chapter 516, Statutes of 2002) establishes statewide regulations for retail sellers of electricity to purchase a portion of that power from renewable sources (CPUC 2016). SB 1078 originally required retail electricity providers to procure at least 1 percent of their electricity supplies from renewable resources to achieve a 20 percent renewable mix by no later than 2017. SB 107 (Simitian and Perata, Chapter 464, Statutes of 2006) accelerated the RPS goal of 20 percent renewables by 2010. In 2011, Governor Jerry Brown signed SB X1-2 (Simitian, Chapter 1, Statutes of 2011, First Extraordinary Session), extending the 20 percent RPS target in 2010 to a 33 percent RPS by December 31, 2020, and broadening the scope of the RPS to include local publicly owned electric utilities (CEC 2016b). In 2015, Governor Brown signed SB 350, which established an additional target of 50 percent renewable energy by 2030 for all electricity providers.

California Building Standards Code

Title 24 of the California Code of Regulations is a statewide standard applied by local agencies through building permits. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. Part 6 (the California Energy Code) and Part 11 (the California Green Building Standards Code) include prescriptive and performance-based standards to reduce electricity and

natural gas use in every new building constructed in California. These standards are updated every three to four years to incorporate new market-ready technologies and design techniques to further reduce energy use from the built environment. The most recent complete update to these standards went into effect July 1, 2014, while an interim update addressing a limited set of issues went into effect July 1, 2015. The 2016 Building Energy Efficiency Standards are currently under development, and will go into effect on January 1, 2017.

Cap-and-Trade

The AB 32 Scoping Plan identifies a cap-and-trade program as a means to reduce GHG emissions from the largest emitters in the state. The cap-and-trade program (Title 17, CCR, Sections 95801-96022) places a cap on GHG emissions from specific sectors. Facilities subject to the rules are allowed to trade permits or allowances to emit GHG emissions. Program rules were adopted into Subchapter 10 Climate Change, Article 5 of Title 17 of the California Code of Regulations. The cap-and-trade program started on January 1, 2012, imposes a 'compliance obligation' on 'covered entities' beginning with their 2013 GHG emissions (California Office of Administrative Law 2016).

A covered entity with a compliance obligation is defined as an entity in California with one or more processes or operations that has emitted, produced, imported, manufactured, or delivered in 2009 or any subsequent year more than the applicable threshold level. In 2012, major GHG sources, such as electricity generation and large stationary sources that emitted more than 25,000 $MTCO_2e$ per year, began to be required to separate the effects of cap-and-trade from the influencing factors on gasoline prices to comply with the cap-and-trade program (California Office of Administrative Law 2016). Starting in 2015, the program expanded to include fuel distributors to address emissions from transportation fuels, and from combustion of other fossil fuels. By expanding the program to fuel distributors, the Legislative Analyst's Office estimates that fuel prices could rise between 13 and 20 cents per gallon by 2020. However, it has been noted that gasoline prices fluctuate over time for a variety of reasons, making it difficult to estimate these impacts (CARB 2016c).

Executive Order B-30-15

Announced by Governor Brown in April 2015, Executive Order B-30-15 establishes a new interim statewide GHG emissions reduction target of 40 percent below 1990

levels by 2030. At the time of writing, Executive Order B-30-15 applied only to state agencies, over which the governor has direct control. This target helps guide California state agencies toward reducing GHG emissions to 80 percent below 1990 levels by 2050, as established by Executive Order S-3-05. The second update to the state's Scoping Plan will incorporate Executive Order B-30-15's guidance to help shape the groundwork for meeting a 2030 emissions reduction target.

General Plan Guidelines

OPR provides guidance to cities in the preparation of their local general plans. The 2003 General Plan Guidelines do not include guidance for climate change mitigation or adaptation; however, OPR is in the process of updating the General Plan Guidelines, and the revised guidelines will include a framework for addressing climate change in general plans. OPR released public review draft guidelines in October 2015. While still in draft form at the time of writing, the 2015 guidelines include multiple objectives and recommended policies addressing air quality and GHG emissions.

Regional

San Luis Obispo Council of Government (SLOCOG) Sustainable Communities Strategy – SB 375 (2008)

In California, the transportation sector produces between 35 percent and 40 percent of the state's GHG emissions, and the Scoping Plan includes a number of measures for the sector. In 2008, California adopted SB 375, the Sustainable Communities and Climate Protection Act. SB 375 attempts to integrate regional land use, transportation, and housing planning in order to reduce GHG emissions from cars and trucks. SB 375 directs CARB to set regional GHG reduction targets for cars and trucks, to assign each metropolitan planning organization a target, and to require each metropolitan planning organization to create a sustainable communities strategy to achieve that target. The law provides relief from specific CEQA requirements for infill development projects that are consistent with the sustainable communities strategy. SB 375 provides one method for local governments to achieve regional transportation-related GHG emissions targets described in the Scoping Plan. Morro Bay is located in the SLOCOG region. SLOCOG's current plan was adopted in April 2015.

San Luis Obispo County Air Pollution Control District (SLOAPCD)

As a result of SB 97, local air districts, including the SLOAPCD, began a process to provide guidance to determine the significance of GHG emissions identified in CEQA documents to local lead agencies. The district's current GHG thresholds, adopted in March 2012, determine the levels beyond which a project in the county would have significant impacts. Although no single land use project could generate enough GHG emissions to noticeably change the global average temperature, cumulative GHG emissions contribute to global climate change and its resulting adverse impacts. Thus, the primary goal in adopting GHG significance thresholds, analytical methodologies, and mitigation measures is to ensure that new land use development provides its fair share of the GHG reductions needed to address cumulative environmental impacts from those emissions. Table 2.13 summarizes the district's GHG emission thresholds.

Table 2.13
SLOAPCD GHG Emissions Thresholds

GHG Emissions Threshold Summary	
Residential and commercial projects	Compliance with Qualified GHG Reduction Strategy OR Bright-Line Threshold of 1,150 $MTCO_2e$ per year OR Efficiency Threshold of 4.9 $MTCO_2e$ per Service Population (residents + employees) year
Industrial (Stationary Sources)	10,000 $MTCO_2e$ per year

Source: SLOAPCD 2012b

Local

City of Morro Bay Climate Action Plan (2014)

In 2014, the City of Morro Bay adopted a CAP. The CAP describes community and municipal GHG emissions, compares future emissions to state-designated AB 32 targets, and defines actions and strategies the City will take to meet both state and local GHG reduction goals. Both community-wide and government operations emissions were inventoried for the CAP, studying emissions from energy use, transportation, waste, water, and off-road emissions, allowing for specific and

attainable goals for GHG reductions. The CAP's target mirrors that of AB 32, setting a goal of 15 percent below baseline (2005) levels by 2020 (City of Morro Bay 2014).

2.3 PRIORITY FINDINGS

LOCAL AIR QUALITY

The eastern portion of San Luis Obispo County is currently in nonattainment for the federal 8-hour ozone standard while the western portion of the county, including Morro Bay, is in attainment for the federal ozone standard. The county is currently designated attainment for all of the other national air quality standards. The county, including Morro Bay, is designated as a nonattainment area for the state one-hour and 8-hour ozone standards, as well as the state 24-hour and annual PM_{10} standards, and is in attainment for the state annual $PM_{2.5}$ standard.

POLLUTANTS AND GHG EMISSIONS FROM ON-ROAD VEHICLES

San Luis Obispo County's criteria air pollutant inventory and Morro Bay's GHG inventory indicate that the largest sources of emissions in and around the community are on-road vehicles. Reducing criteria air pollutant and GHG emissions from vehicles may have a substantial effect on improving air quality concerns in Morro Bay.

STATIONARY SOURCES AND TOXIC HOT SPOTS

Upon the retirement of the Dynegy power plant and the Chevron marine terminal in recent years, stationary sources of criteria pollutants in the city are limited to a dry cleaning facility, gasoline service stations, and auto-body repair shops. CARB has identified eight facilities in Morro Bay that are subject to the Air Toxics Hot Spots reporting requirement under AB 2588 (CARB 2016b).

NONRESIDENTIAL ELECTRICITY REDUCTIONS

The 2015 GHG inventory revealed a larger than anticipated decrease in nonresidential electricity use from 2005 levels. In order to appropriately plan for sustained reductions, and to better understand trends in Morro Bay's nonresidential energy sector, it is necessary to place additional effort into researching the causes of this decrease.

GREENHOUSE GAS TARGET ATTAINMENT

Based on findings in the 2015 community-wide inventory, Morro Bay is just over halfway to its 2020 GHG reduction target. The City will need to prioritize GHG strategies and hasten the pace of reductions in order meet CAP goals and maintain consistency with state targets.

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3.0 Coastal Resilience

Plan MORRO BAY

3.0 COASTAL RESOURCES AND RESILIENCY

The City of Morro Bay is exposed to numerous coastal hazards including flooding, inundation, bluff retreat, and dune erosion. This chapter identifies existing coastal resources in the city, provides a (baseline) assessment of how coastal hazards impact these resources, and provides an assessment of how the hazards and corresponding impacts increase with sea level rise.

> Coastal resilience refers to the ability of a community to "bounce back" after hazardous events such as flooding associated with extreme waves, water levels, or runoff. oceanservice.noaa.gov/facts/resilience.html

Non-coastal hazards are addressed in Chapter 8 (Natural and Environmental Hazards).

3.1 EXISTING CONDITIONS

COASTAL SETTING

The city's coastal setting is described in this section in terms of waves, water levels, and littoral processes. Current and future coastal hazards in Morro Bay are a function of how these processes interact with the natural and built features along the coastline.

Wave Climate

Waves act to carry sand in both the cross-shore and longshore directions and can also cause short-duration flooding events by causing dynamic increases in water levels. Thus, the wave climate (or long-term exposure of a coastline to incoming waves) and extreme wave events are important in understanding future sea level rise vulnerabilities.

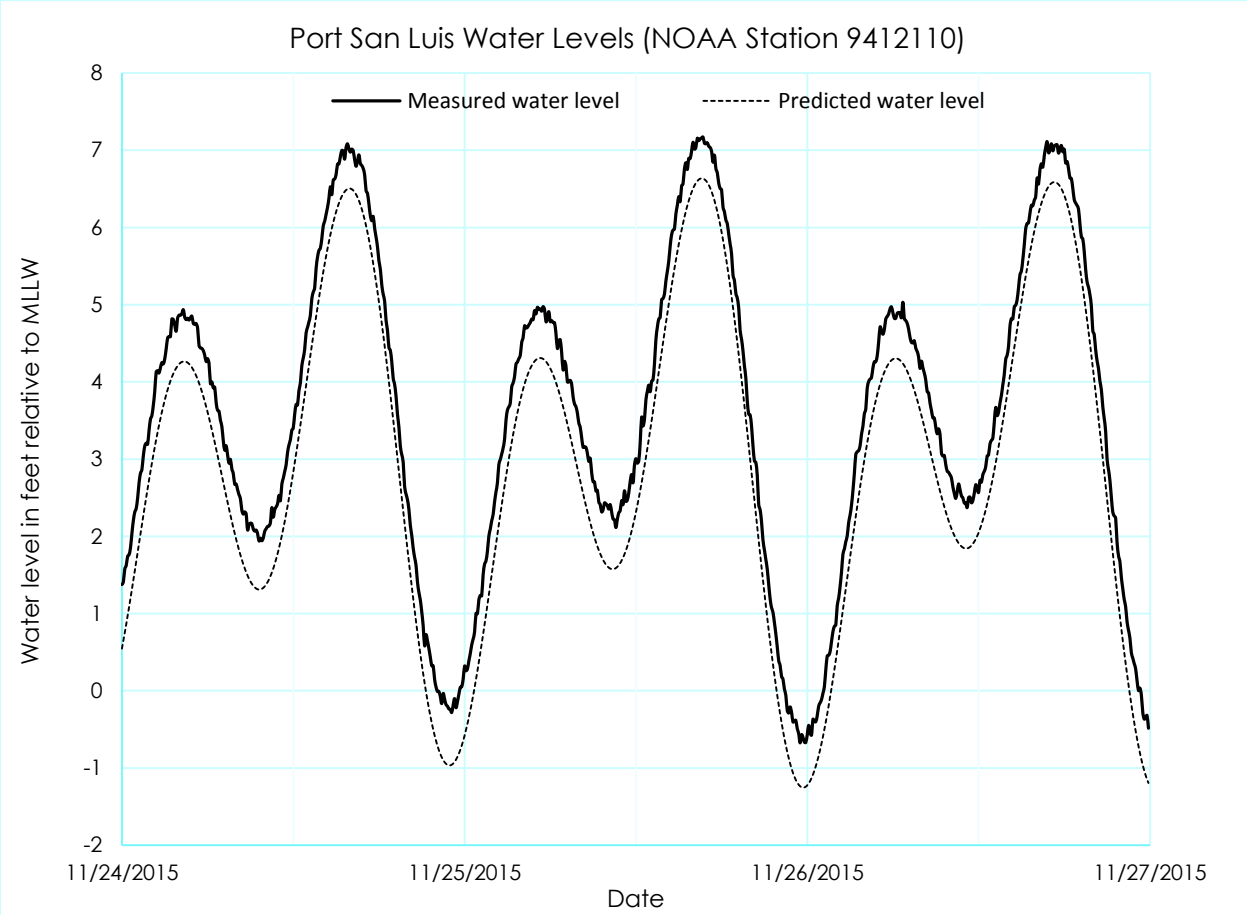
More than 45 percent of the waves approaching Morro Bay are from the west-northwest direction. Historically, the most frequent significant wave height is 8 to 10 feet and the most frequent wave periods are between 12 and 15 seconds. The largest waves occur in the winter when northern hemisphere cyclonic storms generate powerful, long period waves.

Water Levels

The tides in Morro Bay are mixed semidiurnal, with two high tides and two low tides of differing magnitude occurring each day. Astronomical tides make up the most significant amount of the total water level. Typical daily tides range from mean lower low water (MLLW) to mean higher high water (MHHW), a tidal range of about 5.3 feet based on the tidal station at Port San Luis (NOAA station 9412110). During spring tides, which occur twice per lunar month, the tide range increases to about 7 feet due to the additive gravitational forces of the sun and moon. During neap tides, which also occur twice per lunar month, the forces of the sun and moon partially cancel out, resulting in a smaller tide range of about 4 feet. The largest spring tides of the year are sometimes referred to as "king tides" and result in high tides of 6.5 feet or more above MLLW and tidal ranges of more than 8 feet.

In addition to astronomical tide, factors such as sea level anomalies (El Niño events) and storm surge also contribute to the water levels along Morro Bay. An example of this occurred on November 25, 2015, when a king tide of about 6.64 feet above MLLW was predicted but a water level of 7.18 feet was measured at the Port San Luis station. The tide series from this event is shown in Figure 3.1. The predicted astronomical tide was elevated by 0.54 feet due to a sea level anomaly related to the strong El Niño and high ocean temperatures during the 2015–2016 winter season (Doherty 2015).

Figure 3.1
November 2015 Water Levels at Port San Luis



Littoral Processes and Shoreline Change

A littoral cell is a coastal compartment or physiographic unit that contains sediment sources, transport paths, and sediment sinks (Patsch and Griggs 2007). The City of Morro Bay is within the Morro Bay littoral cell, which extends from about Piedras Blancas to Point Buchon in Los Osos. Sinks include aoelian (wind-blown) losses to dunes and cross-shore transport to offshore. Some sinks, such as dunes, can later become sand sources as dunes erode during extreme wave events or as sea levels rise. Other sources of sand to the Morro Bay littoral cell include fluvial delivery of sand and bluff erosion.

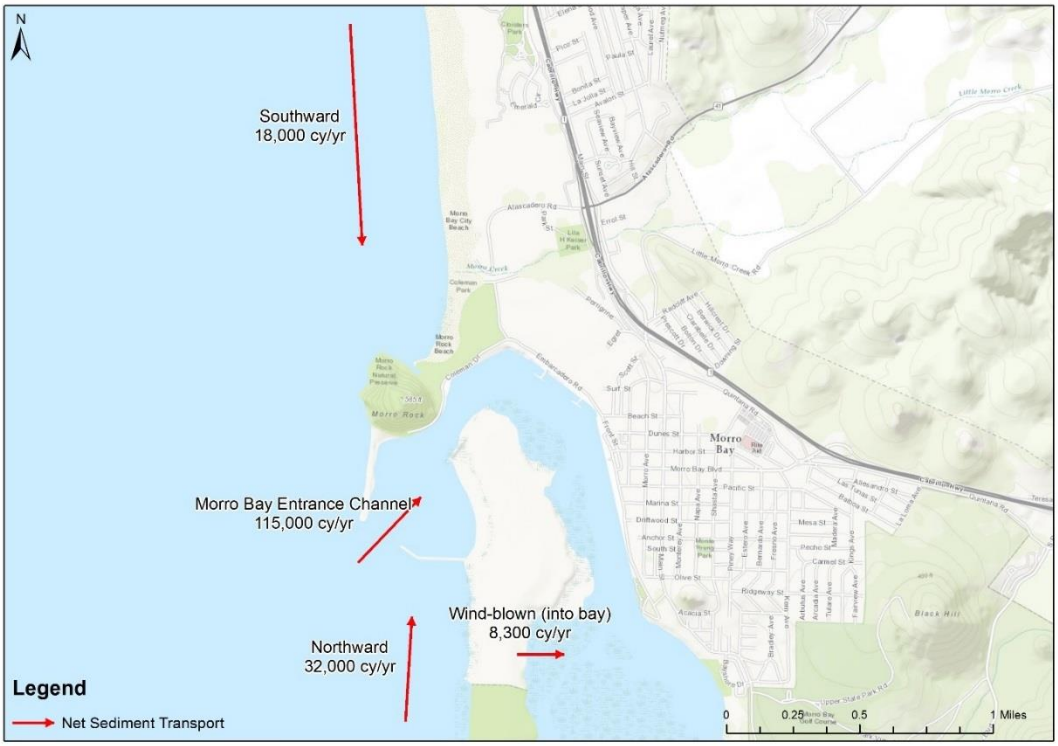
Sediment transport in the city is shown in Figure 3.2, and described in this section. Beaches north of Morro Rock experience a net southward drift of 18,000 cubic yards per year (cy/yr) while beaches south of Morro Rock experience a net northward drift of

32,000 cy/yr (Griggs, Patsch, and Savoy 2005). The Morro Bay entrance channel intercepts approximately 115,000 cy of sediment per year. Sediment is dredged annually by the US Army Corps of Engineers (USACE) and placed in the nearshore and surfzone along Morro Strand State Beach. Placement at this site has resulted in wider beaches than might naturally occur (Griggs, Patsch, and Savoy 2005).

Wind-blown (aeolian) transport of sediment from the dunes into Morro Bay is estimated at 8,300 cy/yr (USACE 2003). The barrier beach is estimated to be migrating landward at a rate of 1.1 to 1.7 feet per year (ft/yr) into the bay (USACE 2003).

Analysis of shoreline position data from 1800 to 2002 found that beaches have accreted 4 inches per year, on average, during this period (Hapke et al. 2006). An analysis of shoreline change from 1970 to 2002 found that the beaches narrowed by 2.3 feet per year on average (Hapke et al. 2006). Thus, the findings of this study suggest that the beaches in the city have been accretional over the long term and erosional in the short term. Short-term erosion rates may be a result of decreased sediment supply or changes in the wave climate.

Figure 3.2
Sediment Budget in Morro Bay



COASTAL HAZARDS AND ASSETS

Coastal resources in the city are diverse and include natural resources such as Morro Rock, Morro Bay Estuary, and sandy beaches backed by dunes and bluffs. Resources of the built environment include the harbor infrastructure, commercial fishing industry, visitor-serving commercial waterfront, and numerous recreational opportunities along the coastline and bay.

Historically, and currently, these resources are vulnerable to coastal hazards. The primary coastal hazards that occur in Morro Bay are flooding (as a result of extreme coastal wave runup and river discharge events), inundation (as a result of daily tides), and bluff and dune erosion resulting from a composite 100-year wave event. The hazard zones are further described below:

- Flood Hazard Zone – Flood events are typically short in duration (i.e., hours) and occur episodically in association with extreme waves and precipitation events (e.g., 100-year return period events). The flood hazard zone shows the limits of extreme water levels associated with a 100-year return event.

- Inundation Hazard Zone – Areas within the inundation hazard zone will be subject to daily wetting and drying associated with tides. A mean high water tide elevation was used as a proxy to represent future inundation hazard zones.

- Bluff Hazard Zone – Rising sea levels may result in the increased erosion of coastal bluffs due to more frequent exposure to wave attack. The bluff hazard zone is the area between the existing and future bluff edge.

- Dune Hazard Zone – Coastal dunes will respond to sea level rise by migrating landward. The dune hazard zone represents the area between the current and future dune toe.

Baseline coastal hazards for 2016 are identified in Figures 3.3 through 3.7. The following narrative provides description of coastal resources and how they are vulnerable to coastal hazards.

Beaches

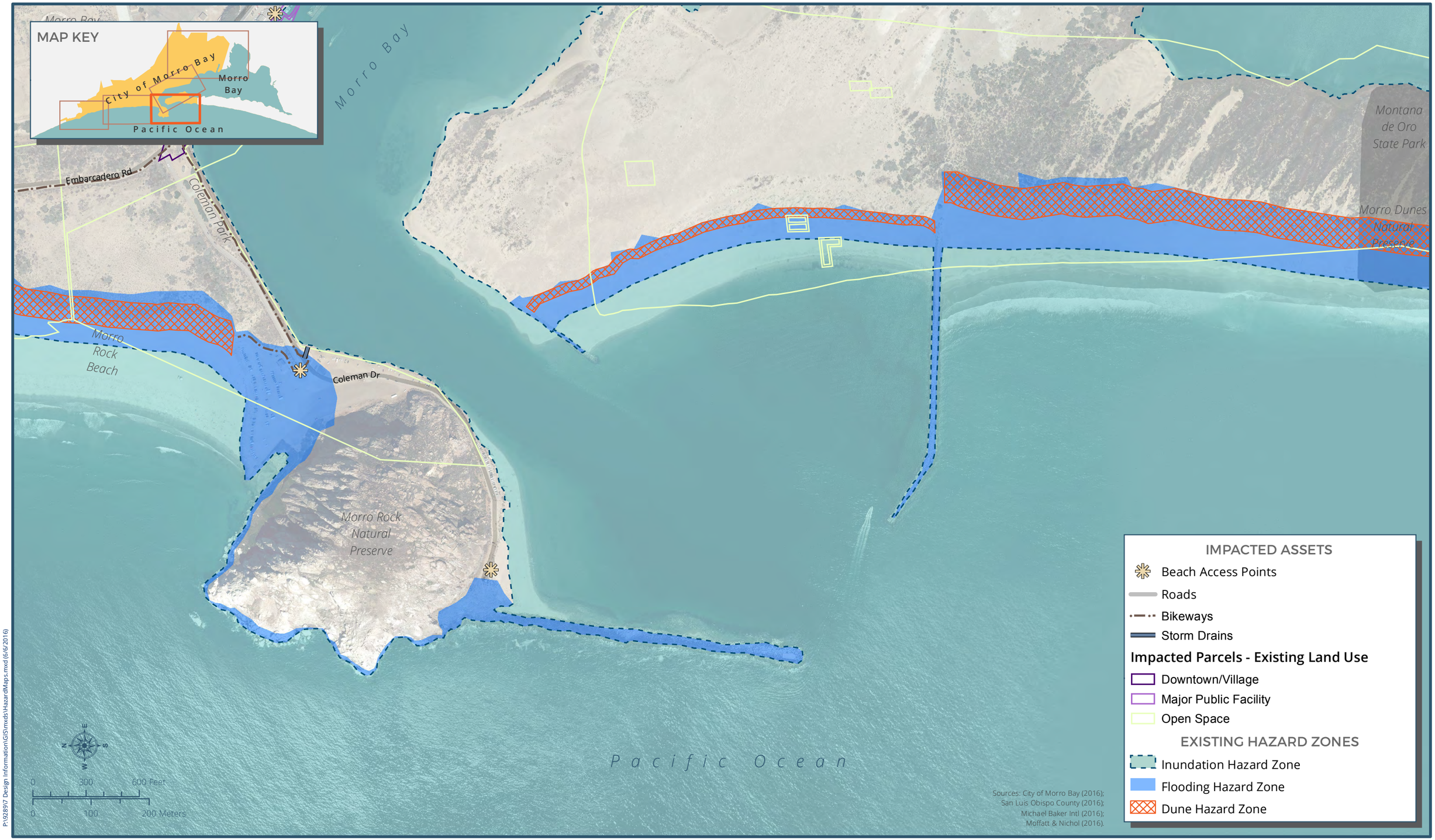
Beaches in the city are mostly managed by the state; however, the City manages Morro Rock Beach and the sandspit. Morro Rock beach is generally a wide, sandy beach backed by dunes just north of the rock. Amenities at this beach include restrooms, picnic tables, and parking. Morro Rock beach is the most popular beach in the city. The sandspit consists of sandy beach and large dunes that make up a landform extending from Los Osos across Morro Bay. Chapter 11 (Parks, Recreation, and Open Space) provides additional detail about beaches in Morro Bay.

In 2016, 54 acres of beaches are vulnerable to and could be impacted by coastal hazards such as flooding and dune erosion. Beaches provide both recreational and storm protection benefits. Beach flooding is generally short in duration, occurring during large surf events; therefore, flooding impacts would be temporary and recreation opportunities largely unaffected following flooding. Dune and beach erosion can result in significant impacts as some areas are lost and changed by erosion; while recreation opportunities would remain largely unaffected, beaches will narrow and storm protection benefits will begin to diminish as dunes erode.

Public Coastal Access

Vertical (access to) and lateral (access along) beach access is abundant in the city. A total of 22 vertical access ways exist along the city's coastline, consisting of sandy trails that lead to the beaches from street ends, City parking lots, and state campgrounds. There are 40 lateral access ways along the city's bayfront, consisting of the beach, bikeways, and other pedestrian improvements in the city. Chapter 11 (Parks, Recreation, and Open Space) provides additional detail about public coastal access in Morro Bay

In 2016, three access points and 24,777 linear feet of access trails are vulnerable to flooding and dune erosion hazards. Access ways may only experience temporary interruptions during flooding events; clearing may be needed following flooding. Access ways that experience erosion may develop drop-offs that will likely adapt from foot traffic and natural processes as beach areas adjust following surf events. Local grading may be used if immediate action is desired to address conditions resulting from erosion along access ways.



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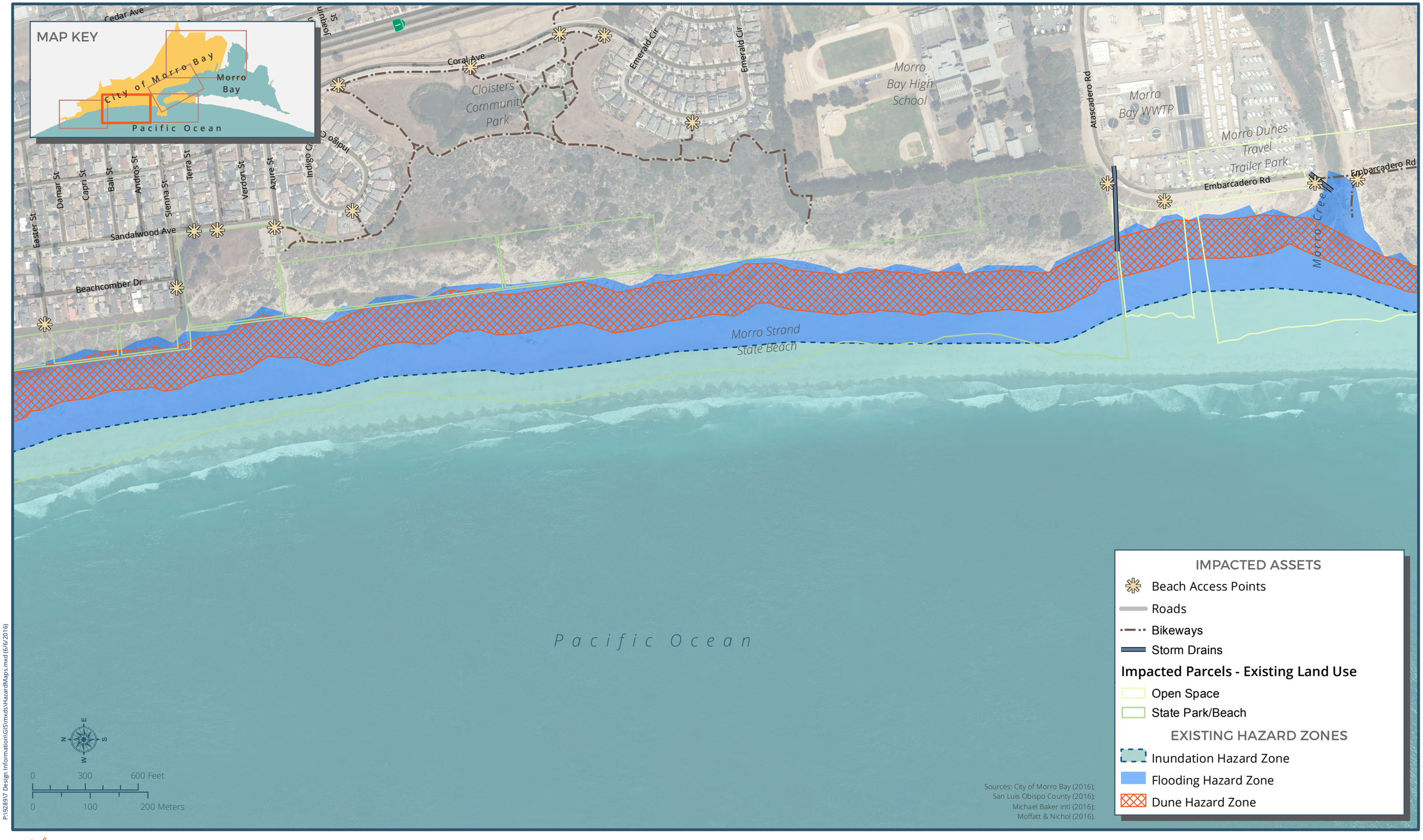
Plan MORRO BAY

EXISTING COASTAL HAZARDS

Plate 1 of 5



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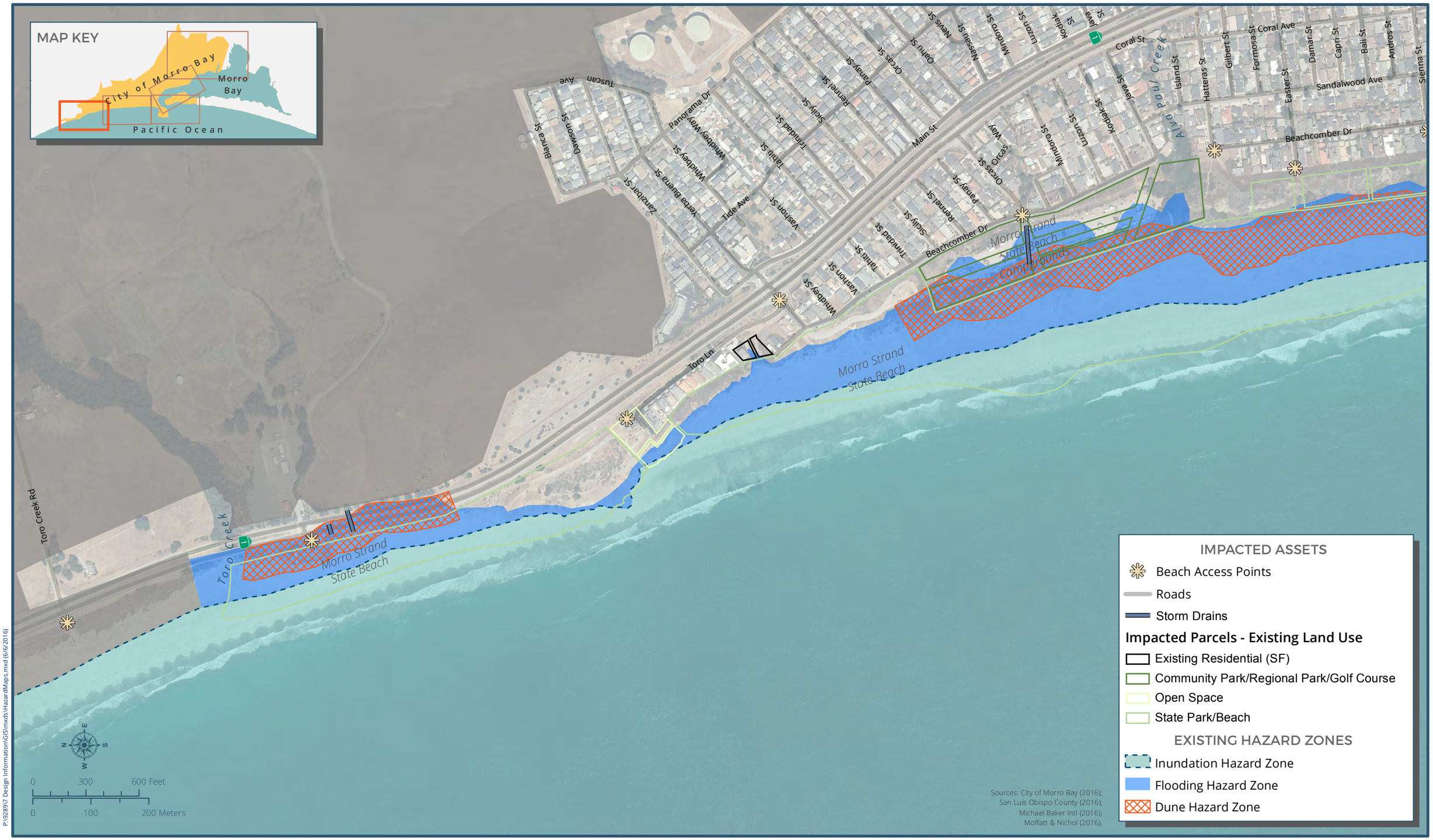
Plan MORRO BAY

EXISTING COASTAL HAZARDS



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EXISTING COASTAL HAZARDS

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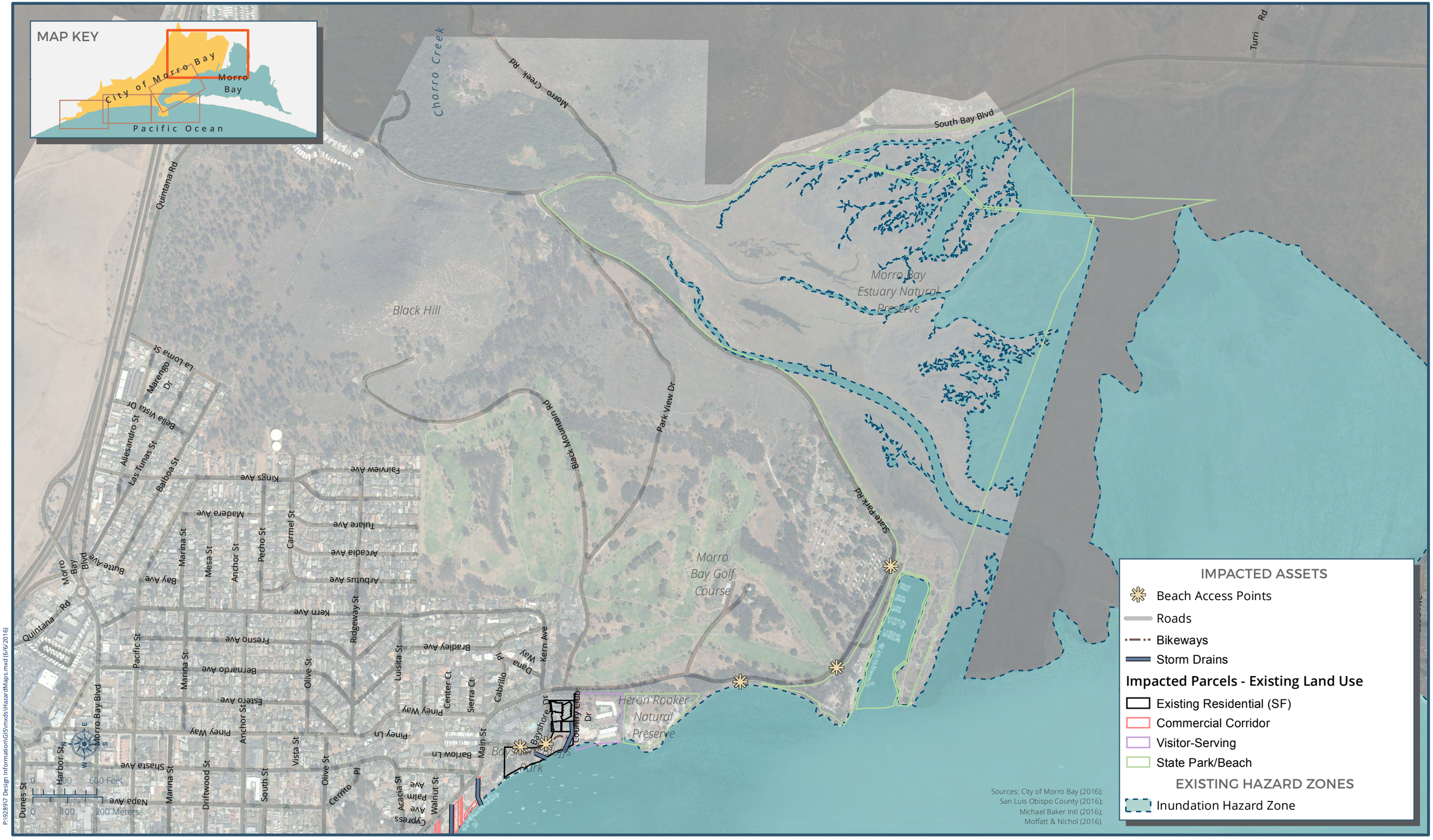
Plan MORRO BAY

EXISTING COASTAL HAZARDS

Plate 4 of 5



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Plan MORRO BAY

EXISTING COASTAL HAZARDS

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State Parks

The Morro Strand State Beach is generally a wide sandy beach backed by dunes and bluffs on the northern end of the city, and extends from Morro Rock beach to the south to beyond city limits to the north. This state beach includes campgrounds, restrooms, picnic tables, and trails. Dunes are vegetated and some are being restored with native habitat.

Along the coastline, the beach and dunes provide habitat for endemic and endangered plant and animal species. This habitat has been historically impacted statewide by coastal development and introduction of nonnative plant species. Local restoration efforts, led by the State Parks Department, have been under way for the last 15 years to restore dune habitats along Morro Strand State Beach. The dunes also provide environmental value in buffering coastal development from wave runup and erosion during extreme storm events. Chapter 11 (Parks, Recreation, and Open Space) provides additional detail about State Parks in Morro Bay.

There are 23 state park parcels currently exposed to flooding and dune erosion hazards. Flooding impacts would be temporary, although clearing may be required with short-term impacts to parking and access. Recreation opportunities in state parks are not inhibited by current coastal hazards; however, natural resources in the state parks are sensitive. Dunes and dune habitats represent a significant natural resource in the state parks as they are actively restored and preserved. Dunes are not expected to naturally reestablish following loss from erosion; because dunes and habitat areas can be lost or diminished, dune and beach erosion may result in significant impacts.

Coastal Development

Coastal development includes city properties and buildings in the coastal zone. These assets provide for homes, goods and services providers, public facilities, worship, and education. City parcel data was used to assess the impacts to these resources. A majority of these parcels feature buildings, while some are open space and City parks with their own unique vulnerabilities. Development in the city is generally set back from the shoreline and behind a natural dune system. Minimal coastal armoring exists to protect existing coastal development. Chapter 7 (Land Use, Community Form, and Coastal Uses)

provides additional coastal development detail; Chapter 12 (Shoreline Management and Protection) provides additional coastal armoring information.

Bayfront coastal development includes City/community parks, the former Morro Bay Power Plant site, commercial uses in the Embarcadero, nature preserves, a state parks marina, and residential homes in the southeastern bay. Development in this area is located adjacent to or overtopping intertidal waters of the bay. The commercial development along the Embarcadero is elevated on pile-supported foundations. The majority of residential development in the south bay is protected with seawalls and bulkhead walls.

In 2016, 53 parcels are vulnerable to inundation, flooding, and dune erosion. Although parcels are vulnerable to these hazards, the impacts are expected to be low. Parcels subject to erosion in the current time horizon do not contain structures and their value and use is not expected to change. Parcels exposed to inundation along the bayfront have structures that are elevated on pile-supported foundations or protected with seawalls and bulkhead walls. These features will continue to provide protection.

Utilities: Water, Wastewater, Gas, Electricity and Telecommunications

Utilities are the facilities necessary to run the City effectively and efficiently since loss of water, sewer, or power would significantly disrupt quality of life for residents. Critical infrastructure facilities in the city include the PG&E substation, City desalination facility and the Morro Bay Wastewater Treatment Plant. Components of these facilities, such as sewer pump stations and electrical transformers, are also vulnerable in that flood damages could result in utility service disruptions. Chapter 6 (Infrastructure and Public Services) provides additional information about utilities in Morro Bay.

Currently, there are no major utility systems or components identified as vulnerable to coastal hazards. However, important facilities such as the PG&E substation and wastewater treatment plant are located within the FEMA 100-year floodplain of Morro Creek.

Transportation: Roads, Bike, and Pedestrian Assets

The city's transportation network is vital for public circulation, access, emergency services, and evacuation. Highway 1, Morro Bay Boulevard, Main Street, and South Bay Boulevard are examples of major elements of the city's transportation network. Most of the city's transportation infrastructure is outside of the reach of existing coastal hazards. However, Highway 1 in the northern portion of the city is located in close proximity to the ocean on a coastal bluff. Coastal protection has been placed to protect the roadway in this location. State Park Road, located in the south bay, is also subject to coastal flooding due to its low elevation and proximity to the bay. Chapter 13 (Transportation and Mobility) provides additional information about transportation in Morro Bay.

There are 2,025 linear feet of roadway currently vulnerable to coastal hazards. Flooding and dune erosion hazards exist along Highway 1 south of Toro Creek. Highway 1 is a major north–south transportation corridor and evacuation route. Roadways are highly sensitive to flooding as this can result in temporary traffic delays and road closures. Erosion along Highway 1 could result in extended road closures while repairs are made. Flooding hazards exist along Coleman Drive, but would be short in duration, although require clearing.

Environmentally Sensitive Lands

This category includes habitats in the coastal environment of Morro Bay such as the estuary, dunes, and tidally influenced streams. The Morro Bay Estuary is home to a variety of wetlands, salt and freshwater marshes, intertidal mudflats, and subtidal habitats and serves as a vital stopover and wintering ground for many migratory birds in the Pacific Flyway (MBNEP 2016).

The importance of this habitat led to the creation of the Morro Bay National Estuary Program (MBNEP) in 1995. The MBNEP is one of 27 national estuarine programs focused on water quality and the integrity of these valuable and sensitive estuarine systems. Despite being one of the least disturbed estuaries in Southern and Central California, the estuarine habitats face many stressors including saltwater intrusion, accelerated sedimentation, water quality concerns due to pollutant loading, increasing demand for freshwater resources, and threats to existing biodiversity (MBNEP 2016). Eelgrass has declined rapidly in Morro Bay since 2007 and is cause for great concern since the estuary

sustains the only major eelgrass habitat between San Francisco and Los Angeles (MBNEP 2014). Dynamic conditions in the estuary make it difficult to discern variables driving changes in eelgrass habitats. A combination of factors is likely driving the decline of eelgrass. These include sedimentation, water quality, dredging activities, and coastal storm impacts (MBNEP 2013). These lands provide the backdrop for visual and cultural resources of intrinsic value to the City of Morro Bay. Additional natural resources information is provided in Chapter 9 (Natural Resources).

These lands are currently vulnerable to flooding and dune erosion. Flooding can result in short-term impacts as habitats recover from temporary saltwater inundation. Dune erosion represents a greater impact to sensitive habitats as these areas can be permanently lost if the shoreline continues to retreat. Once eroded, the dune systems are not expected to naturally reestablish and can then be less resilient to impacts from extreme storms.

3.2 PROJECTED CONDITIONS

Sea level rise has the potential to result in significant changes within the coastal zone. Current sea level rise projections and methods used to map how these increased water levels may impact the city are described in this section.

SEA LEVEL RISE PROJECTIONS

There is broad agreement in the scientific community that the earth is predicted to warm and that sea levels will rise as a result of the thermal expansion of water and increased contributions from melting glaciers (CO-CAT 2013; CCC 2015). Though there is consensus among the scientific community on these concepts, the timing and severity of sea level rise is relatively uncertain and is dependent on region-specific conditions. The uncertainty in the sea level rise projections is a result of future global emissions of carbon dioxide (a function of future social behavior) and the nonlinear response of the ocean to warmer temperatures and contributions from land-based ice sources. Planning for potential future sea levels provides the City with the tools to make current and future planning decisions that will allow its resources to adapt to changing conditions.

As a supporting study to a Local Coastal Program update, the most relevant guidance to this analysis is the California Coastal Commission (CCC) Sea Level Rise Policy Guidance

(CCC 2015). This guidance provides detail on how to conduct these vulnerability analyses and states to utilize best available science for the analysis. The 2012 National Research Council report, "Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future," is considered the best available science for California (CCC 2015; CO-CAT 2013). Sea level rise projections for the various planning horizons being considered (i.e., 2030, 2050, and 2100) were derived from this study. The 2012 study's high-range sea level rise projections for the area south of Cape Mendocino were used as the basis of the vulnerability assessment (Table 3.1).

Table 3.1
Sea Level Rise Projections for Morro Bay

Year	Projected Sea Level Rise (ft)	Projection Uncertainty (ft, +/-)	Low Range (ft)	High Range (ft)
2030	0.5	0.2	0.2	1.0
2050	0.9	0.3	0.4	2.0
2100	3.1	0.8	1.5	5.5

(Source: National Research Council 2012)

COASTAL HAZARD ANALYSIS AND MAPPING

Morro Bay's exposure to future rates of sea level rise was determined through modeling and analyses performed by Moffatt & Nichol (M&N) for this assessment. The sea level rise projections shown in Table 3.1 were used as the basis for analysis. The modeling efforts depict coastal flooding, shoreline change, and bluff response to a composite, 100-year wave event in combination with various rates of sea level rise and baseline water levels (i.e., high tide, storm surge, sea level anomaly, and river discharge). See Appendix A for more detailed information on model data inputs, assumptions, and limitations.

VULNERABILITY AND RISK ASSESSMENT METHODS

A vulnerability assessment was performed to identify impacts that sea level rise and coastal hazards may have on existing resources and assets in the city. Vulnerability was assessed as a function of an asset's exposure, sensitivity, and adaptive capacity. A numerical rating system was used to develop an overall vulnerability rating for each asset category at the 2016, 2030, 2050 and 2100 time horizons. The definition of these terms

and the rating system used are described in the Table 3.2. A vulnerability rating of low (3-4), moderate (5-7), or high (8-9) was assigned for each asset category based on the sum of ratings for exposure, sensitivity, and adaptive capacity.

While the vulnerability assessment was performed to identify impacts from sea level rise, a risk assessment was performed to evaluate the magnitude of these impacts and likelihood of occurrence. The risk assessment was performed qualitatively to help the City manage risk related to sea level rise in its planning and decision-making process.

Table 3.2
Vulnerability Rating System

Exposure is the degree to which an asset or resource is susceptible to coastal hazards such as flooding, inundation, and bluff erosion for a given sea level rise scenario. The mapped hazard zones were used to rate the level of exposure to a given asset or category.		
Category	Rating	Explanation
Exposure	Low (1)	Asset or resource partially exposed to flooding, inundation, or bluff/dune erosion.
	Moderate (2)	Asset or resource moderately exposed to flooding, inundation, or bluff/dune erosion.
	High (3)	The majority of the asset or resource is exposed to flooding, inundation, or bluff/dune erosion.
Sensitivity is the degree to which the function of an asset or resource would be impaired (i.e., weakened, compromised, or damaged) by the impacts of sea level rise. *Example: State Park Road/Main Street in the vicinity of the campground has a high sensitivity to sea level rise because even minor flooding can cause significant disruption in service.*		
Category	Rating	Explanation
Sensitivity	Low (1)	Asset or resource is not affected or is minimally affected by coastal hazards at a given sea level rise scenario.
	Moderate (2)	Asset or resource may experience minor damage or temporary service interruption due to coastal hazard impacts, but can recover relatively easily.
	High (3)	Asset or resource would experience major damage or long-term service interruptions due to coastal hazard impacts, requiring significant effort to restore/rebuild to original condition.
Adaptive capacity is the inherent ability of an asset or resource to adjust to sea level rise impacts without the need for significant intervention or modification. *Example: Some wetland habitats have a high adaptive capacity due to their ability to naturally migrate landward and upward with rising water levels, provided adequate space exists.*		
Category	Rating	Explanation
Adaptive Capacity	High (1)	Asset or resource can easily be adapted or has the ability and conditions to adapt naturally.
	Moderate (2)	Asset or resource can be adapted with minor additional effort.
	Low (3)	Asset or resource has limited ability to adapt without significant changes.
Vulnerability Scoring (Exposure + Sensitivity + Adaptive Capacity): Low (3-4) Moderate (5-7) High (8-9)		

This vulnerability assessment quantitatively evaluates and rates sea level rise impacts to various city assets. Evaluated asset categories include beaches, public access ways, state parks, parcels, critical infrastructure, and transportation.

VULNERABILITY AND RISK ASSESSMENT FINDINGS

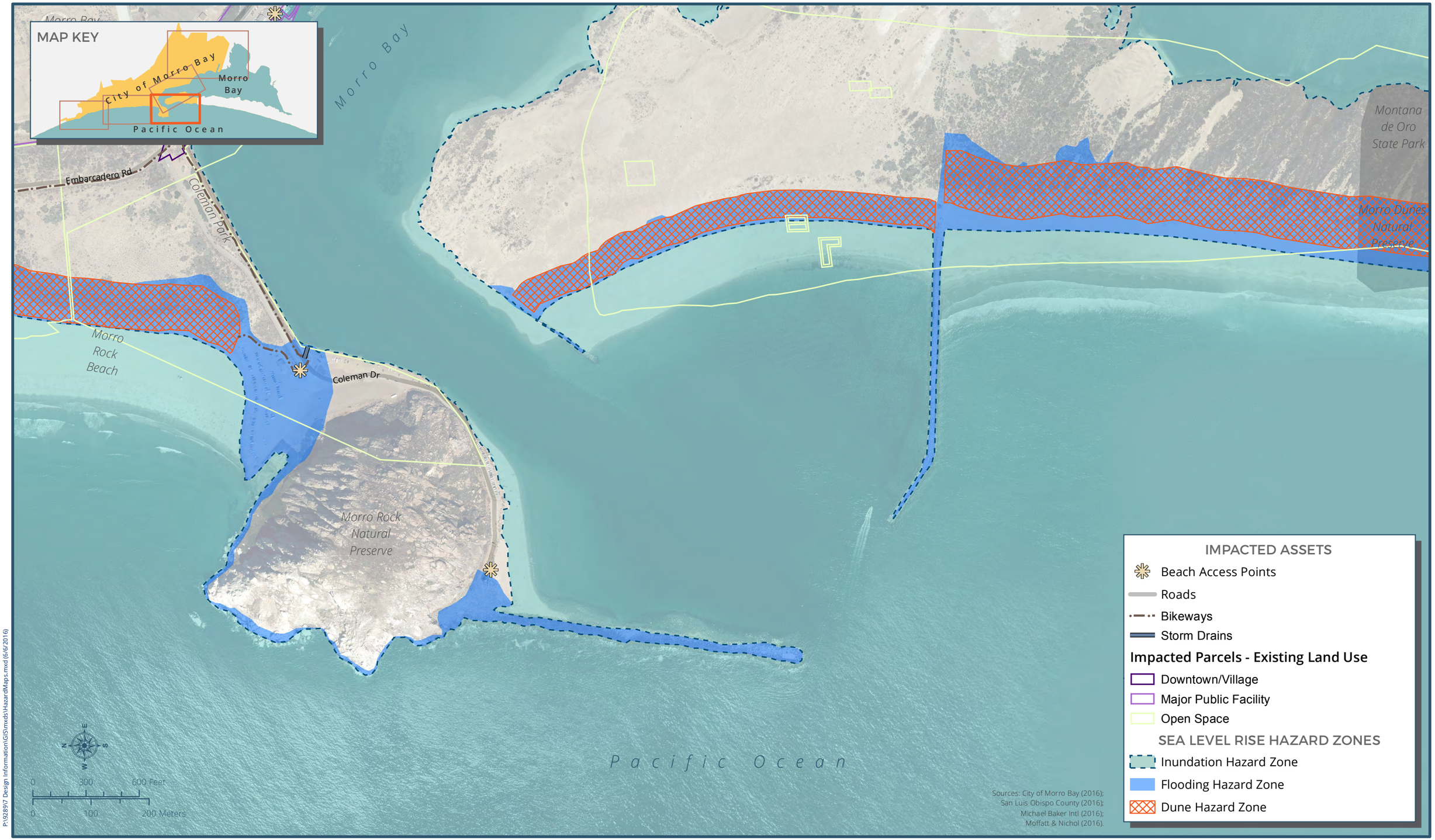
Results of the vulnerability assessment are discussed in this section for years 2030, 2050 and 2100. For simplicity and to align with the Local Coastal Program/General Plan update planning horizon, vulnerability graphics are provided in this section for year 2050 only (Figures 3.8 through 3.12). Vulnerability graphics for year2030 and 2100 are included in Appendix B.

A tabular summary of the results of vulnerability assessment is provided in Table 3.3. A particular asset's exposure to sea level rise was characterized in terms of hazard type and quantity of assets impacted for each planning horizon. A discussion of the vulnerability and risk assessment is also provided for each asset category.

Table 3.3
Vulnerability Assessment Summary

Asset Category	Horizon	Hazard Type	Impacted Assets	Exposure Rating	Sensitivity Rating	Adaptive Capacity Rating	Vulnerability Rating (Score)
Beaches	2016	Bluff Erosion, Flooding	54 acres	2	1	1	Low (4)
	2030	Inundation, Dune and Bluff Erosion, Flooding	60 acres	2	1	1	Low (4)
	2050		68 acres	3	2	2	Moderate (7)
	2100		96 acres	3	3	3	High (9)
Public Access Ways	2016	Flooding, Dune Erosion	3 access points 24,777 LF trails	1	1	1	Low (3)
	2030		3 access points 26,936 LF trails	1	1	1	Low (3)
	2050		7 access points 28,329 LF trails	1	1	1	Low (3)

Asset Category	Horizon	Hazard Type	Impacted Assets	Exposure Rating	Sensitivity Rating	Adaptive Capacity Rating	Vulnerability Rating (Score)
	2100	Inundation, Flooding, Dune Erosion, Bluff Erosion	13 access points 37,052 LF trails	2	2	2	Moderate (6)
State Parks	2016	Flooding, Dune Erosion	23 parcels	2	2	3	Moderate (7)
	2030		27 parcels	2	2	3	Moderate (7)
	2050		28 parcels	2	3	3	High (8)
	2100	Inundation, Flooding, Dune Erosion	33 parcels	3	3	3	High (9)
Coastal Development (Parcels)	2016	Inundation, Flooding, Dune Erosion	53 parcels	1	1	1	Low (3)
	2030	Inundation, Flooding, Dune Erosion, Bluff Erosion	66 parcels	1	1	1	Low (3)
	2050		74 parcels	1	2	2	Moderate (5)
	2100		133 parcels	2	2	3	Moderate (7)
Utilities	2016	None	0	N/A	N/A	N/A	N/A
	2030		0	N/A	N/A	N/A	N/A
	2050		0	N/A	N/A	N/A	N/A
	2100	Flooding, Dune Erosion	1 parcel	2	2	3	Moderate (7)
Transportation (Road, Bike, Pedestrian)	2016	Flooding, Dune Erosion, Bluff Erosion	2,025 linear feet	1	3	3	Moderate (7)
	2030	Inundation, Flooding, Dune Erosion, Bluff Erosion	2,715 linear feet	1	3	3	Moderate (7)
	2050		4,102 linear feet	1	3	3	Moderate (7)
	2100		13,162 linear feet	3	3	3	High (9)



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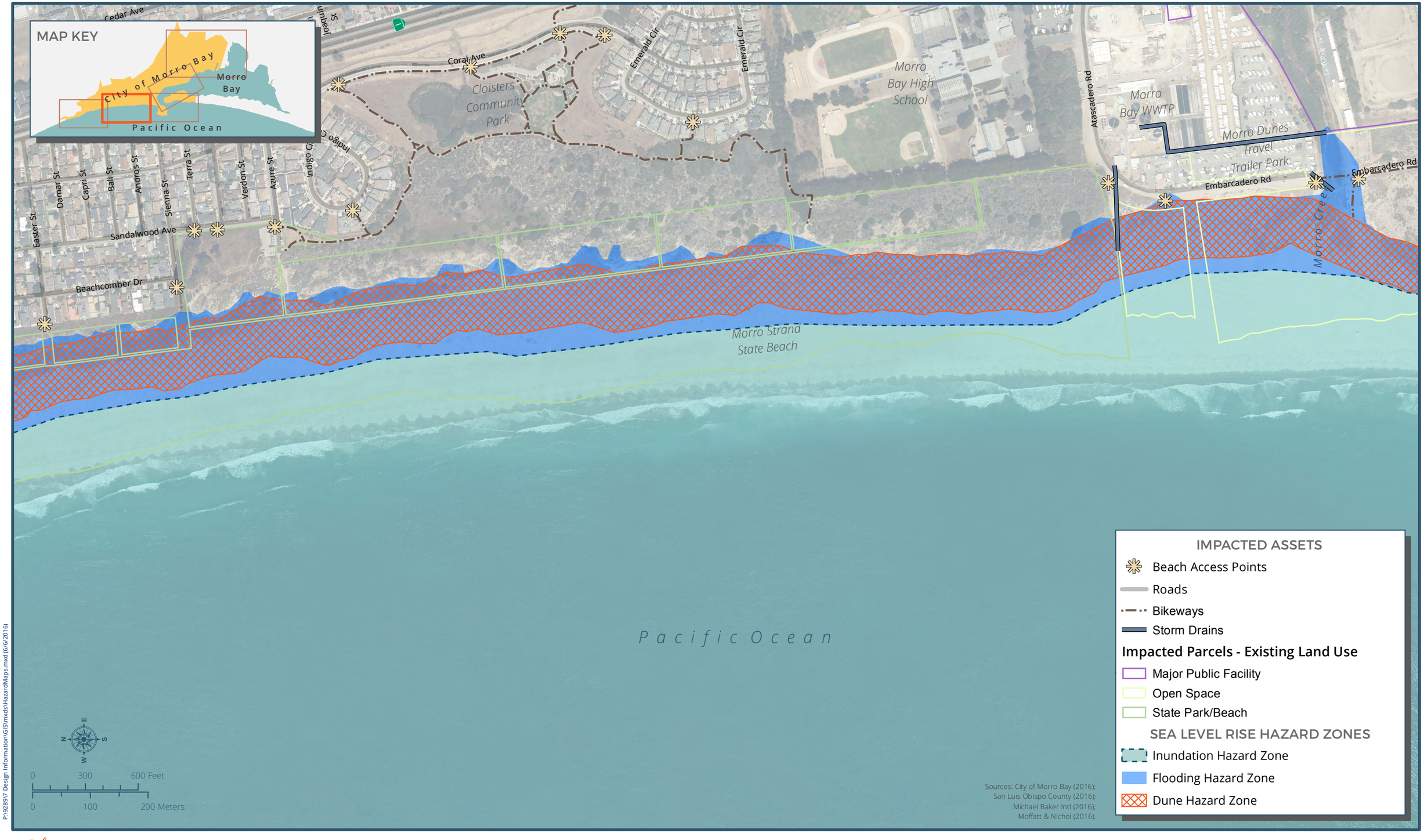
Plan MORRO BAY

YEAR 2050 SEA LEVEL RISE HAZARDS

Plate 1 of 5



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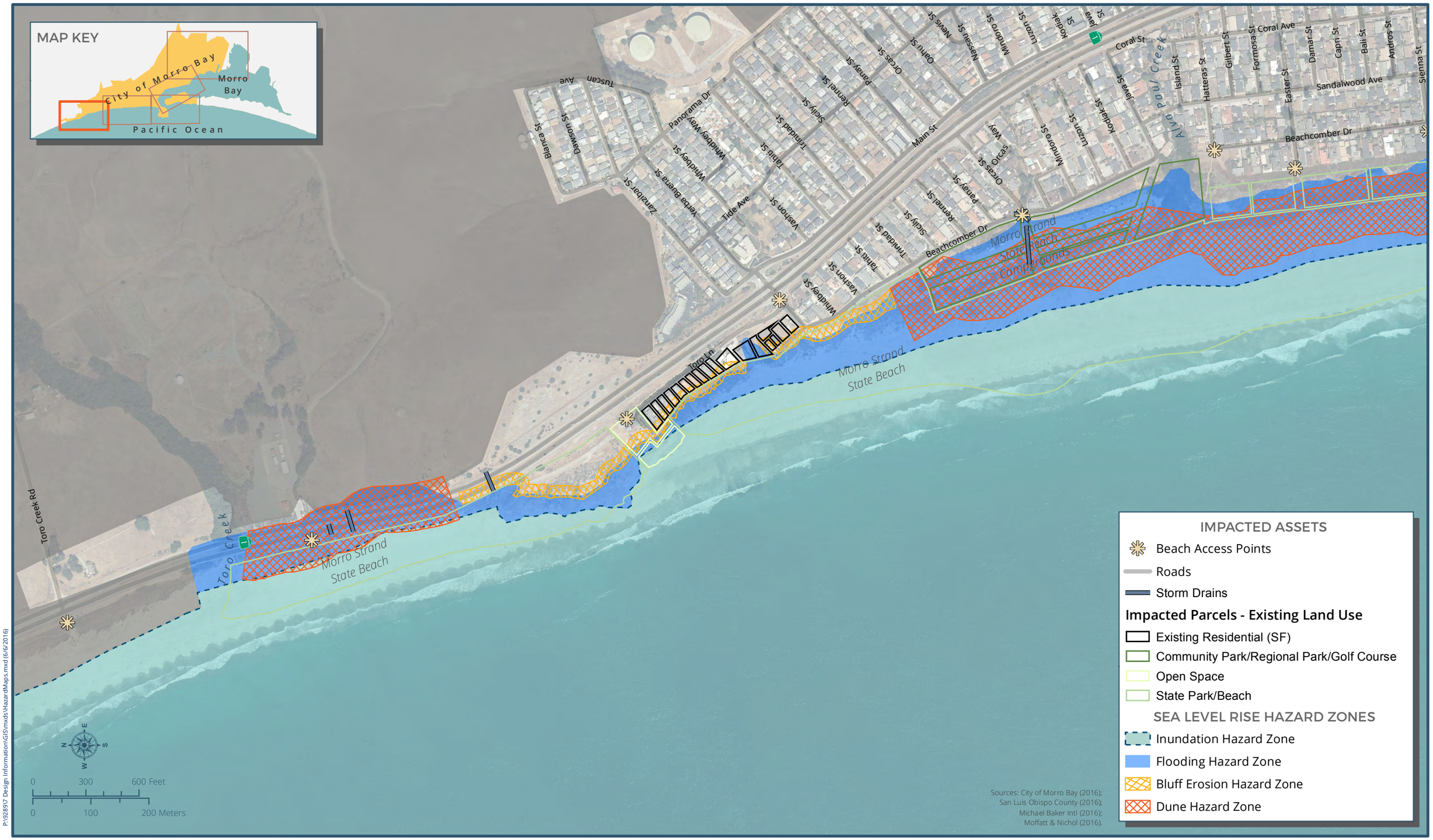
Plan MORRO BAY

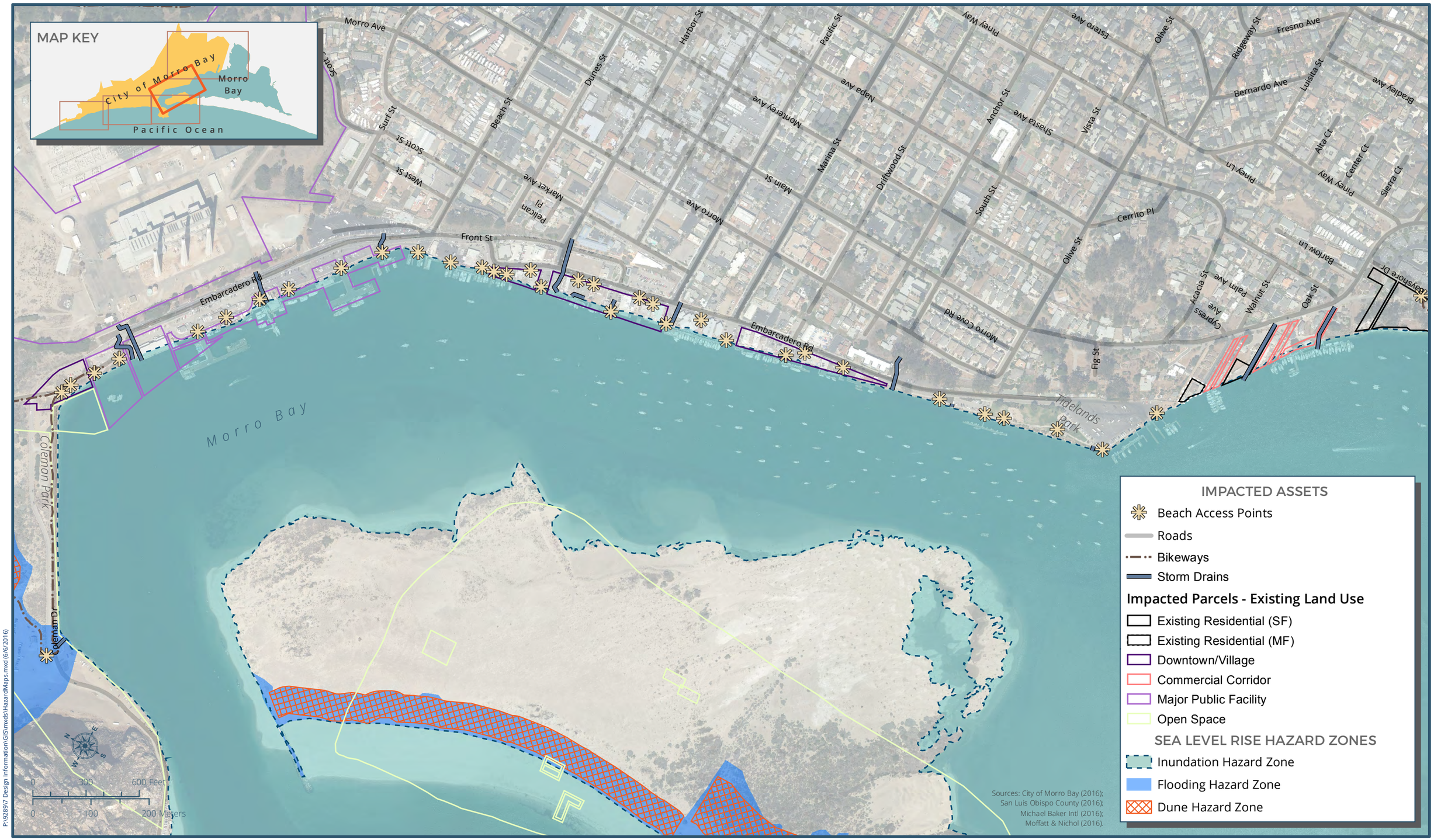
YEAR 2050 SEA LEVEL RISE HAZARDS



Plan MORRO BAY

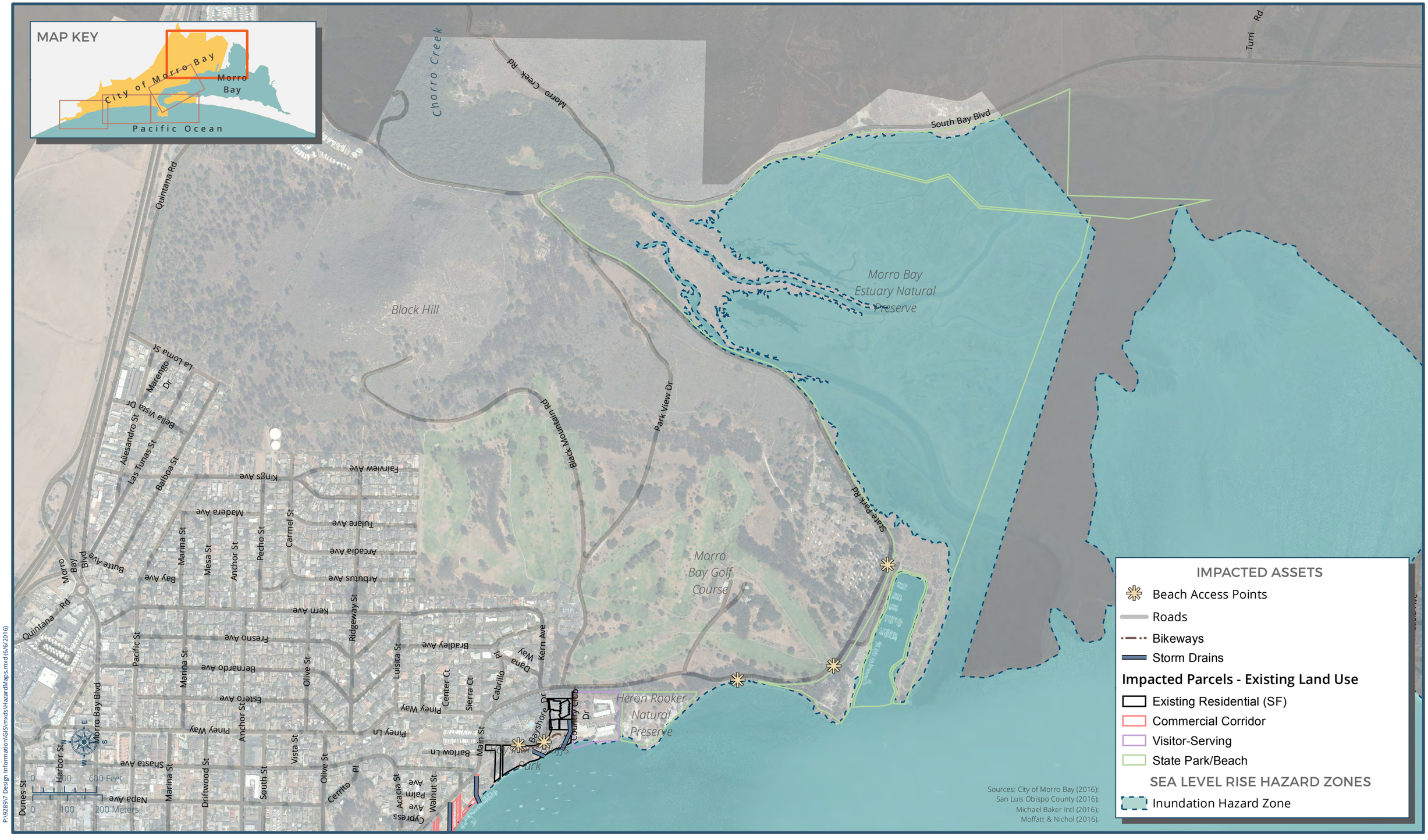
YEAR 2050 SEA LEVEL RISE HAZARDS

Plate 3 of 5



Plan MORRO BAY

YEAR 2050 SEA LEVEL RISE HAZARDS



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Plan MORRO BAY

YEAR 2050 SEA LEVEL RISE HAZARDS

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Beaches

Sandy beaches are highly vulnerable to sea level rise impacts, and erosion impacts are anticipated in any sea level rise scenario. In a natural setting, beaches can be thought to have a high adaptive capacity because they will naturally adjust to a rising sea level if adequate sand exists in the system. However, the adaptive capacity of beaches can be low in areas where beaches are backed by coastal structures or development or where insufficient sand exists in the system.

Year 2030 Vulnerabilities

The overall vulnerability rating for beaches is low for 2030. Approximately 60 acres of beach area are projected to be impacted by a combination of inundation, flooding, and erosion in 2030. Beaches will continue to provide recreation and storm protection benefits during this time horizon (low sensitivity). This impact poses a low risk to the city; although there is a high likelihood of beach loss occurring due to sea level rise, there are low consequences to overall beach function based on shoreline change from modeling results.

Year 2050 Vulnerabilities

Vulnerability is rated moderate for the 2050 horizon, as approximately 68 acres are projected to be impacted by coastal hazards compared to the current horizon. With an increase in inundated, flooded, and eroded areas, impacts will cover greater beach areas and be closer to oceanfront assets, prompting the need for minor to moderate adaptation in sensitive areas where adequate sand may not exist. Beaches will continue to provide recreation and storm protection with a reduced but sizeable beachfront under predicted inundation levels.

Year 2100 Vulnerabilities

A high vulnerability rating has been selected for the 2100 horizon due to the significant erosion expected as a total of approximately 96 acres become impacted by coastal hazards compared to the current horizon, and beaches become squeezed between rising sea levels, dunes, and bluffs. This vulnerability poses a high risk to the city as increased beach erosion will reduce the natural barrier to storm waves and reduce

opportunities for beach access and recreation. Because beach visitation from residents and out-of-town guests often produces economic benefits for City businesses (e.g., retail, restaurants, hotel), there may also be adverse economic costs associated with such impacts.

Public Access Ways

Public access ways consist of vertical beach access points and lateral access ways (trails) that run along the beach and bay. Coastal flooding and erosion have the potential to impact these beach access points and access trails. For example, erosion of the beach may create a large scarp (or drop-off) at the end of a beach access trail. Generally, public access ways have a relatively high exposure due to their location at sandy beaches and waterfronts. In beach areas where access ways are exposed to inundation, flooding, and erosion, there is a low to moderate sensitivity as they are already located in a dynamic environment. Access ways can often naturally adapt to increased water levels and erosion, although some minor repair and adaptation measures may be needed. Waterfront access ways on fixed or floating structures will continue to provide access as long as they are located at an elevation above predicted water levels or are able to accommodate increased water levels.

Year 2030 Vulnerabilities

Overall, the vulnerability of access ways is low for this time horizon due to the low number of impacted access ways and access points, their low sensitivity to coastal hazards, and minor or no adaptation needed. Wave forces during large surf may physically damage trails, making them temporarily impassable. Three access points to ocean-fronting beaches and 26,936 linear feet of trails may be temporarily impacted during storm events but will likely still be viable immediately after storm events; however, some may require minor adaptation like clearing and grading. Bay side beach access points are not expected to be impacted by coastal hazards in this time horizon.

Year 2050 Vulnerabilities

Vulnerability remains low for the 2050 horizon with seven access points on ocean-fronting beaches and 28,329 linear feet of trails impacted by coastal hazards. This represents a small increase in number of impacted access points and length of trail from

the 2030 horizon along with a small increase in temporary impacts due to flooding and erosion with minor or no adaptation needed. Bay side beach access points are not expected to be impacted by coastal hazards in this time horizon.

Year 2100 Vulnerabilities

Public beach access ways will be moderately vulnerable in the 2100 horizon with 13 access points and 37,052 linear feet of trails impacted by coastal hazards. In this time horizon, one of the impacted access points will be located on the bayfront; however, the remaining bayfront access points are not expected to be impacted. A majority of impacted access ways will likely become impassible during large surf but remain viable after. Some access ways may encounter damage due to erosion, thus requiring minor to moderate repairs and adaptations such as clearing, grading, and fill. Access points that become inundated in 2100 will naturally migrate inland, and some adaptation may be needed to maintain safety and ease of access at these locations.

State Parks

State park facilities along the shoreline consist of parking lots, campgrounds, and a marina. Dunes and dune habitats represent a significant natural resource in the state parks as they are actively restored and preserved. State park facilities are recognized as important assets to the city in terms of economic and recreation value. The state park facilities also provide an important low cost visitor-serving amenity with prime access to coastal resources. Though economic impacts to the physical structures (i.e., asphalt paving, restrooms, some utilities and marina facilities) in the affected state parks would be relatively low, loss of these amenities would be significant since these features may not be easily or realistically moved inland.

Year 2030 Vulnerabilities

Overall, vulnerability for the 2030 time horizon is moderate and many impacts are expected to be temporary, only occurring during large surf events. The state parks have a variety of assets providing coastal access and recreation opportunities that are vulnerable to coastal impacts. In this time horizon, 27 parcels are exposed. Temporary impacts due to flooding could affect parking and access corridors, particularly in the vicinity of Morro Rock. Following flooding, clearing may be necessary to restore full

accessibility in these areas. The Morro Strand campground is vulnerable to flooding and erosion, and clearing and minor erosion repairs may be needed following a high surf event. The state park marina will be largely unaffected as floating docks, gangways, and fixed access ways should be able to accommodate higher water levels. Natural features in the state parks have an elevated vulnerability, due to low adaptive capacity to migrate inland and moderate to high resource sensitivity. Dunes are not expected to naturally reestablish following loss from erosion; because dunes and habitat areas can be lost or diminished, dune and beach erosion may result in significant impacts.

Year 2050 Vulnerabilities

Vulnerability in the 2050 time horizon has been rated as high; one additional parcel is exposed under this condition and assets from the 2030 horizon are exposed to additional flooding and erosion. Coastal access and recreation opportunities will remain viable in this time horizon; however, temporary disruptions during high surf events are more likely and widespread. Additional parking and access corridor areas will be exposed to flooding in the vicinity of Morro Rock and will require clearing following a high surf event. The Morro Strand campground will be exposed to additional flooding and erosion; along with clearing, minor adaptation may be required to maintain functionality. Some adaptations to floating docks, gangways, and fixed access ways may be required in the state park marina to accommodate increased water levels. Some natural features may adapt in this horizon; however, many features may be lost and unable to naturally migrate inland. Where possible, restoration efforts may be needed to reestablish features like dunes and habitats. Dunes will continue to erode inland toward development and may no longer exist in some areas.

Year 2100 Vulnerabilities

State parks have a high vulnerability in the 2100 time horizon. Coastal access and recreation opportunities may be impeded by temporary disruptions due to flooding and dune erosion. The Morro Strand campground may require significant adaptation to remain functional prior to and following flooding and erosion events. Lands surrounding the state park marina will be inundated and floating docks, gangways, and fixed access ways may require significant adaptation to accommodate increased water levels. Access to the marina via State Park Road will be impacted as portions of the road become inundated. Dune losses and associated habitat losses will increase and in some areas

may be completely lost as erosion carries inland to the line of development. Dune habitats are of intrinsic value to the state parks, providing ecological, recreational, and storm protection values; therefore, their loss will be significant.

Coastal Development

Coastal development evaluated for sea level rise impacts include privately held parcels of various land uses g. Current City land use data was used to categorize the parcels. Parcels generally have a low adaptive capacity and high sensitivity. However, the adaptive capacity of buildings could potentially be moderate for some parcels with finished floors on an elevated building pad. Note that impacts to parcels may not necessarily represent impacts to the physical buildings located on the parcel.

Year 2030 Vulnerabilities

Coastal development has a low vulnerability during the 2030 time horizon, with 66 parcels exposed to coastal hazards. Portions of parcels, where buildings are located, along the bayfront may be exposed to flooding in year 2030. However, the majority of buildings themselves do not appear flooded in this scenario and are supported on structures above predicted water levels or fronted by shore protection in the form of a revetment or seawall (low exposure). Increased water levels may impact parcel usage but impacts to structures are not expected. Bayfront parcels with coastal access, including gangways, floating docks, and fixed docks/access ways, should be able to accommodate water levels predicted for 2030. Oceanfront parcels have a low exposure to coastal hazards during this time horizon.

Year 2050 Vulnerabilities

With a small increase in exposure (low exposure), totaling 74 parcels, a moderate vulnerability to coastal development exists in the 2050 time horizon. A moderate rating has been assigned as development is typically sensitive to episodic flooding and erosion with little adaptive capacity. Bayfront parcels will largely maintain conditions as seen in the 2030 horizon, with the height of structures and protection above predicted water levels. Some parcels with coastal access ways and docks may need modifications to accommodate increased water levels.

Oceanfront parcels in the vicinity of Toro Lane may experience bluff erosion. Adaptation may be needed to maintain parcel use. No other privately held oceanfront parcels are exposed to coastal hazards during this time horizon.

Year 2100 Vulnerabilities

Vulnerability of coastal development is moderate for the 2100 time horizon due to the increased exposure and sensitivity of parcels to flooding, erosion, and inundation during an extreme storm event. In 2100, 133 parcels are exposed to coastal hazards. This poses a high risk to parcel owners due to the higher consequence of damage under the storm scenario evaluated for this planning horizon. Bayfront parcels will continue to experience increased water levels, thus impacting uses, but structures are expected to only be moderately sensitive as most are above predicted water levels. However, a portion of the golf course will be particularly sensitive to inundation. Many parcels with coastal access ways and docks will need modification to accommodate the water levels predicted for this time horizon.

Oceanfront parcels along Beachcomber Drive and Toro Lane are exposed to flooding, dune, and bluff erosion hazards. The parcels are highly sensitive to flooding and erosion events. Furthermore, the adaptive capacity of these parcels is low, requiring significant changes to maintain current use.

Utilities: Water, Wastewater, Gas, Electricity, and Telecommunications

Utility assets include facilities necessary to run the city effectively and efficiently since loss of water, sewer, or power would significantly disrupt quality of life for residents. This infrastructure typically has a high sensitivity and low adaptive capacity. Wastewater was determined to be the only vulnerable utility to sea level rise. The wastewater treatment plant site was found to be vulnerable to coastal flooding by the 2100 time horizon. Impacts to the wastewater treatment plant are not expected in the 2030 and 2050 time horizons.

Vulnerability of the wastewater treatment plant is rated as high due to the high sensitivity and low adaptive capacity of this asset in its current state. The wastewater treatment plant is exposed to flooding and erosion hazards that could lead to a disruption of

service during a large surf event. Service disruption can result in overflow conditions where untreated and partially treated wastewater is released on-site and through outfall facilities.

Since the wastewater treatment plant is planned for relocation, the vulnerability of proposed future property uses to sea level rise and associated coastal hazards should be considered.

Transportation: Roads, Bike, and Pedestrian Assets

Transportation-related assets are generally highly sensitive to coastal hazards as even minor amounts of flooding can cause significant traffic delays and potentially disrupt emergency service vehicles and evacuation routes. Maintenance and repair requirements may also increase after significant flooding and erosion events. Roadways typically have a low adaptive capacity because significant costs are associated with relocating or raising these structures. Many roadways include bike and pedestrian facilities or have separate bike and pedestrian facilities running parallel to roads.

Year 2030 Vulnerabilities

A moderate vulnerability exists for transportation corridors in 2030 when a total of 2,715 linear feet are exposed to coastal hazards. Highway 1 provides a vital north–south connection and will be partially exposed to flooding and dune erosion during extreme storms in the 2030 planning horizon. The hazards to Highway 1 are localized to the area south of Toro Creek. Note that the dune hazard zone in this area assumes the revetment in this area fails or is overwhelmed, thus allowing erosion to continue landward of this feature.

Flooding hazards also exist along Coleman Drive and at Morro Rock Beach parking lot during this time horizon. Flooding of these areas would be of short duration and episodic in nature but could result in temporary access constraints and increased maintenance and cleanup costs. Although the exposure to hazards is considered low for the 2030 horizon, roads are sensitive to flooding and can create traffic delays and become impassible with any flooding. Depending on the city's tolerance for these events, vulnerabilities may be considered greater.

Year 2050 Vulnerabilities

The rating for transportation asset vulnerabilities in the 2050 time horizon remains moderate due to the localized and relatively small increase in flood and erosion hazard areas of Highway 1. There is a modest increase in flooding hazards along Coleman Drive in the vicinity of Morro Rock and some flooding and erosion hazards along local roads of ocean-fronting areas. A total of 4,102 linear feet of transportation assets will be exposed. Exposure remains low but the sensitivity of Highway 1 continues to increase as greater lengths of the road become impacted by coastal hazards.

Year 2100 Vulnerabilities

Vulnerability is considered high for the 2100 planning horizon as major transportation corridors in the city become exposed to inundation, flood, and erosion hazards. Exposure becomes high as 13,162 linear feet become exposed along with a greater portion of Highway 1 and portions of Main Street/State Park Road. Flood hazards continue to increase on Coleman Drive in the vicinity of Morro Rock. Inundation, flood, and erosion hazards increase along local roads in ocean-fronting areas such as Beachcomber Drive. Major corridors will be highly sensitive to flooding in this time horizon due to the low adaptive capacity. Improvements will likely be needed to maintain continuous access.

Qualitative Assessment of Resource Vulnerabilities

Certain assets are difficult to quantify; thus, a qualitative analysis was conducted to describe how these resources may be impacted by sea level rise. These assets include environmentally sensitive lands, harbor resources, visual resources, cultural resources, and saltwater intrusion, as discussed below.

Environmentally Sensitive Lands

Environmentally sensitive lands include wetlands, rivers, riparian areas, dunes, and other natural resources in the coastal zone. These lands generally have some adaptive capacity in areas where adequate space exists for them to naturally shift landward due to a rising sea level.

In the 2030 time horizon, environmentally sensitive lands begin to experience increased tidal inundation with rising in sea levels. Wetland hydrology may be altered by the rising freshwater-saltwater interface (CNRA 2014) and intertidal and subtidal ecosystems may be affected by changes in water depth and sunlight penetration. Some flora and fauna may be able to adapt by migrating vertically and/or horizontally. As sea levels continue to rise in 2050 and 2100, exposure will increase and may adversely impact density and diversity of these resources. Many flora and fauna may not be able to adapt due to lack of suitable upland areas or failure to keep pace with the rate of sea level rise.

Restoration efforts may be needed, where possible, to adapt certain species to predicted water levels. Many areas with steep slopes and urban development constrain the space available for landward migration. Risk of this vulnerability is high as the consequences to density and diversity of environmental resources are significant.

Eelgrass is a sensitive environmental resource in Morro Bay. It has been actively monitored by the MBNEP since 2007. Eelgrass has declined rapidly in Morro Bay since that time and the decline is cause for great concern since the estuary sustains the only major eelgrass habitat between San Francisco and Los Angeles (MBNEP 2014). Dynamic conditions in the estuary make it difficult to discern variables driving changes in eelgrass habitats. A combination of factors is likely driving the decline of eelgrass; these include sedimentation, water quality, dredging activities, and coastal storm impacts (MBNEP 2013). Increases in the quantity of sediment from sources that outlet into the estuary and decreased sediment quality due to pollutants may be the cause of these declines. Sedimentation of the bay can be accelerated by large precipitation events, coastal storms, wildfires, urban development, grazing, and cultivation practices. Intertidal channel erosion can also impact eelgrass habitats. (MBNEP 2013)

Fisheries are another environmental resource which face a similarly dynamic multitude of variables. A decline in density and diversity of coastal habitats can impact fisheries as these areas provide food sources, shelter, and hatching grounds for many organisms. In addition, warmer water temperatures can result in harmful algal blooms and increased prevalence of pathogens and disease which can impact both plant and animal species (MBNEP 2016).

Harbor Resources

The harbor in Morro Bay is a resource to mariners, providing a critical harbor of refuge and vessel mooring which supports the local marine industry, including commercial fishing. In turn, the harbor also contributes to the cultural and economic resources of the City of Morro Bay.

As discussed in the Coastal Development section, marinas, gangways, docks, and other areas where vessels are moored may accommodate some amount of sea level rise while others may require modifications. Mooring areas that are able to accommodate or have been modified for sea level rise will continue to function similarly. Mooring hardware and structures which mooring hardware is fastened to should be in good repair and appropriately sized. During a storm event, increased wind loads and bay currents on moored vessels can result in failure of undersized or deteriorated mooring hardware and associated structures.

The USACE owns and maintains key resources that facilitate safe passage for vessels in Morro Bay. Historically, the USACE has frequently dredged the federal channel in Morro Bay. The federal channel consists of the entrance channel, the transition channel, the sand trap, the main channel, the Navy channel, and the Morro Channel. The USACE also owns and maintains the Morro Bay Harbor jetty system, which consists of a northern breakwater and southern rock jetty structures used to stabilize the Morro Bay entrance channel. Continued maintenance dredging of the federal channel along with maintenance of the Morro Bay Harbor jetty system is needed to maintain safe passage for vessels regardless of rising sea levels. Dredging activities are not expected to increase in frequency or effort with rising sea levels. The Morro Bay Harbor jetty system may require upgrades as determined by the USACE to provide current levels protection with projected sea level rise.

Visual Resources

Visual resources in the City of Morro Bay include views of the beaches, bluffs, dunes, Morro Bay, Pacific Ocean, and Morro Rock. As sea levels rise, sandy beaches will become narrower due to erosion and inundation. Erosion may alter the size and appearance of bluffs and dunes fronting the beach. Views may also be impacted by coastal structures built to protect assets or to accommodate sea level rise. Waterfront views may be impacted if structures increase in height in order to accommodate increased water levels.

Cultural Resources

Historic sites existing within the coastal hazard zones will be vulnerable. In addition to physical impacts, exposure of historic sites can lead to irreplaceable loss of cultural heritage. Erosion, inundation, and flooding of these coastal areas could result in vulnerability and/or loss of any archaeological resources that exist in these areas.

Saltwater Intrusion

As sea levels rise, saltwater has the ability to migrate inland through man-made and natural channels, drainage structures, soils, and underground pathways. The migration of saltwater results in salinity changes that can lead to a variety of ecological and agricultural resource impacts. Additionally, saltwater intrusion can impact freshwater resources including surface waters and groundwater.

3.3 REGULATORY SETTING

The following sections summarize the agencies that may be involved in issues related to coastal hazards. Additional coastal regulations are outlined in Chapter 12 (Shoreline Management and Protection).

FEDERAL AGENCIES

National Oceanic and Atmospheric Administration (NOAA) Fisheries

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, NOAA Fisheries must be consulted on any potential impacts to Essential Fish Habitat. Essential Fish Habitat includes all tidal waters; therefore, future adaptation strategies that involve actions in tidal waters will require consultation with NOAA Fisheries.

US Army Corps of Engineers (USACE)

Any action that involves the placement of structures or sand below the high water line requires a permit from the USACE under Section 404 of the Clean Water Act. Any project that places structures or sand below the mean high tide line or that involves dredging requires a permit from the USACE under Section 10 of the Rivers and Harbors Act. For projects below the mean high tide line, the USACE processes the Section 10 and Section 404 permits together. Adaptation strategies such as beach nourishment or repair of shoreline protection structures will likely involve work with USACE jurisdiction.

US Fish and Wildlife Service

Under Section 7 of the Federal Endangered Species Act, a federal agency must consult with the US Fish and Wildlife Service for any project that has the potential to affect a federally listed threatened or endangered species. Species of concern for activities in Morro Bay include the snowy plover and least tern.

STATE AGENCIES

California Coastal Commission

The California Coastal Act requires cities and counties in coastal California to prepare Local Coastal Programs that provide ground rules for future development and protection of resources in the coastal zone. The CCC Sea Level Rise Policy Guidance (CCC 2015) lays out the following guiding principles for addressing the challenge of rising sea levels:

- Use Science to Guide Decisions
- Minimize Coastal Hazards Through Planning and Development Standards
- Maximize Protection of Public Access, Recreation, and Sensitive Coastal Resources
- Maximize Agency Coordination and Public Participation

A certified Local Coastal Program is intended to be the implementing mechanism for adaptation strategies to minimize hazards and protect coastal resources from impacts related to sea level rise. The CCC is responsible for certification of Morro Bay's updated Local Coastal Program and will provide feedback on adaptation policies and programs developed by the city.

Regional Water Quality Control Board

Any project that requires a Section 404 permit from the USACE must also obtain a Water Quality Certification under Section 401 of the Clean Water Act from its affiliated Regional Water Quality Control Board. Adaptation strategies such as beach nourishment or repair of shoreline protection structures will likely require a Water Quality Certification.

California State Lands Commission

The state of California owns state tidelands, which generally are all lands seaward of the mean high tide line. This includes the waterside infrastructure along the Morro Bay Embarcadero that supports commercial fishing and recreational boating activities. If a project extends into state lands, a letter of concurrence for the activity will need to be obtained from the California State Lands Commission.

3.4 PRIORITY FINDINGS

EXISTING COASTAL RESOURCE VULNERABILITIES

Under existing (baseline) conditions, beaches and dunes are among the most exposed resources along the open coastline. Erosion and flooding associated with extreme storm events can result in significant loss of beach area and dune habitat. The sandy beaches are more resilient than dunes and typically regain width during calm wave conditions. Once eroded, the dune system takes a longer time to reestablish and is less resilient to impacts from extreme storms.

Despite being one of the least disturbed estuaries in Southern and Central California, the environmentally sensitive habitats of the Morro Bay Estuary face many stressors including saltwater intrusion, accelerated sedimentation, water quality concerns due to

pollutant loading, increasing demand for freshwater resources, and threats to existing biodiversity (MBNEP 2016).

Much of the coastal development faces limited exposure to inundation, erosion, and flooding from coastal storm events under the baseline conditions. Coastal development north of Morro Rock is set back from the active shoreline and protected by the beach and dune system. Along the bayfront, most development is elevated above extreme high water levels and protected by a revetment or bulkhead structure.

PROJECTED COASTAL RESOURCE VULNERABILITIES

Projected vulnerabilities were evaluated for three sea level rise scenarios representing the upper range of projections for years 2030, 2050 and 2100. Coastal hazards were mapped for each scenario to estimate flooding, inundation, dune erosion, and bluff erosion hazard areas. A summary of coastal resources vulnerable to sea level rise in year 2100 is provided in Table 3.4. Year 2030 and year 2050 are provided for reference where notable differences exist.

Table 3.4
Priority Findings Summary table

Asset Category	Potential Impacts	Consequences
Transportation	Highway 1, south of Toro Creek, vulnerable to flooding and erosion in 2030. Coleman Drive and the Morro Rock parking lot are vulnerable to flooding in 2050. Main Street/State Park Road vulnerable to flooding in 2100.	Interruption of a major north–south transportation and evacuation route (Highway 1).
		Traffic delays, road closures, debris, and damage.
Environmentally Sensitive Lands	Wetlands, intertidal, and subtidal habitats impacted by increased tidal inundation in 2030. Impacts more significant in 2050 and beyond as steep topography and development limit the ability of habitats to adapt.	Loss of habitat area and species diversity.
State Parks	Dune system and Morro Strand campground vulnerable to flooding and erosion in 2030, more so in 2050 and 2100.	Loss of sensitive dune habitat and loss of recreational beach area.

Asset Category	Potential Impacts	Consequences
Beaches	Flooding, erosion, and inundation of sandy beaches, dunes, and bluffs. Significant loss of beach area expected for 2050 and 2100.	Loss of recreation opportunities and storm protection provided by beaches.
Coastal Development	Moderate vulnerability to coastal development in 2050 due to storm-related flooding. Increased vulnerability in 2100 as flooding, dune erosion, and bluff erosion impact oceanfront parcels.	Impacts to uses and value of residential and commercial parcels.
Utilities	The wastewater treatment plant site was found to be vulnerable to coastal flooding by the 2100 time horizon.	Disruption of water treatment service, damage to infrastructure, potential overflow.

Flooding is generally short in duration (hours); however, it can present significant disruptions to parcels, critical infrastructure, and transportation corridors. Parcels may be highly sensitive to flooding, especially if the finished floor elevation of a structure is below flood depths. Flooding of residential parcels may displace homeowners, result in property damage, and decrease value, while commercial parcels may experience operation interruptions, displacement, and property/equipment damage. Critical infrastructure, specifically the wastewater treatment plant, would be highly sensitive to flooding due to the consequences of service interruptions and potential for the release of untreated sewage. Transportation corridors may remain viable after flooding; however, any amount of flooding can temporarily disrupt traffic and choke vital transportation and evacuation routes.

Erosion may be gradual or episodic and consequential to many assets based on their exposure and sensitivity. Beaches, state parks, parcels, and transportation corridors are exposed to dune and bluff erosion hazards. Erosion at beaches and state parks may impact recreational opportunities as sand and dune areas become squeezed between rising seas and upland development. Storm protection provided by beaches, dunes, and bluffs will be degraded as erosion progresses inland, which can result in damage to roadways, residential parcels, and commercial parcels currently fronted by these features.

Inundated areas will be subject to daily wetting from tidal waters impacting beaches, state parks, parcels, and transportation corridors. Inundation will reduce recreation space and opportunities in state parks and beaches. Transportation corridors subject to

inundation will no longer be viable. Parcel inundation may result in damage and displacement with impacts to structures, use, and value. Environmentally sensitive lands may decrease in density and diversity as significant habitat areas are lost and species are unable to keep pace with rising seas or become constrained by development or geographic features.

4.0 Cultural Paleontological, and Mineral Resources

Plan MORRO BAY

4.0 CULTURAL, PALEONTOLOGICAL, AND MINERAL RESOURCES

This chapter identifies existing and historical cultural, paleontological, and mineral resources conditions in the planning area, as well the regulatory conditions relating to cultural, paleontological, and mineral resources.

4.1 EXISTING CONDITIONS

CULTURAL BACKGROUND

Prehistoric

Morro Bay lies in the Central Coast archaeological region (Moratto 1984; Jones et al. 2007). The Central Coast is defined as extending from south of San Francisco Bay to the northern edge of the Southern California Bight (Jones et al. 2007). Following Jones et al. (2007), the prehistoric cultural chronology for the Central Coast can be generally divided into six periods: Paleo-Indian (ca. 10,000–8,000 B.C.), Millingstone/Early Archaic (8,000-3,500 B.C.), Early (3,500-600 B.C.), Middle (600 B.C.-A.D. 1000), Middle-Late Transition (A.D. 1000-A.D. 1250), and Late (A.D. 1250-contact [ca. A.D. 1769]).

Recent data from Paleo-Indian sites in Southern California indicate that the economy was a diverse mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas (Jones et al. 2002) and on Pleistocene lake shores in eastern California (Moratto 1984). Although few Clovis-like or Folsom-like fluted point arrowheads have been found in Southern California (Erlandson, Cooley, and Carrico 1987), it is generally considered that the emphasis on hunting may have been greater during the Paleo-Indian period than in later periods.

The Millingstone period, as defined by Wallace (1955, 1978) and recognized on the Central Coast by Greenwood (1972), is characterized by an ecological adaptation to collecting suggested by the appearance and abundance of well-made milling implements. Millingstones occur in large numbers for the first time in the region's archaeological record, and are even more numerous near the end of this period. Aside

from millingstones, typical artifacts during this period include crude core and cobble-core tools, flake tools, large side-notched projectile points, and pitted stones (Jones et al. 2007).

An extensive series of shoreline midden deposits are within the Central Coast region dating to the Early period, signifying an increase in occupation of the open coast (Jones 1995; Jones and Waugh 1995, 1997). Sites dating to this period are marked by large lithic artifact assemblages, which include Central Coast Stemmed Series and side-notched projectile points. The material culture recovered from Early period sites within the Central Coast region provides evidence for continued exploitation of inland plant and coastal marine resources. Artifacts include milling slabs and handstones, as well as mortars and pestles, which were used for processing a variety of plant resources. Bipointed bone gorge hooks were used for fishing. Shell beads and obsidian are hallmarks of the trade and exchange networks of the Central and Southern California coasts. The archaeological record indicates a substantial increase in the abundance of obsidian at Early period sites in the Monterey Bay and San Luis Obispo areas (Jones and Waugh 1997).

A pronounced trend toward greater adaptation to regional or local resources occurred during the Middle period. For example, the remains of fish, land mammals, and sea mammals are increasingly abundant and diverse in archaeological deposits along the coast. Related chipped stone tools suitable for hunting were more abundant and diversified, and shell fishhooks became part of the toolkit during this period. Larger knives, a variety of flake scrapers, and drill-like implements are common during this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Bone tools, including awls, are more numerous than in the preceding period, and the use of asphaltum adhesive became common. Sites from this period show a retention of stemmed points and the disappearance of the larger side-notched points (Jones et al. 2007).

The Middle-Late Transition period is marked by relative instability and change, with major changes in diet, settlement patterns, and interregional exchange. The relatively ubiquitous Middle period shell midden sites found along the Central Coast were abandoned by the end of the Middle-Late Transition period, so most Transition period and Late period sites were first occupied during those periods (Jones and Ferneau 2002). One site (Site SLO-239) has been tentatively dated to the Middle-Late Transition period

and contains the only residential feature, a circular house floor, dating to this time period (Jones et al. 2007; Mikkelsen, Hildebrandt, and Jones 2000).

Late period sites are marked by small, finely worked projectile points, such as desert side-notched and cottonwood points, as well as temporally diagnostic shell beads. The small projectile points are associated with bow and arrow technology and indicate influence from the Takic migration from the deserts into Southern California. Common artifacts identified at Late period sites include bifacial bead drills, bedrock mortars, hopper mortars, lipped and cupped *Olivella* shell beads, and steatite disk beads. The presence of beads and bead drills suggest that low-level bead production was widespread throughout the Central Coast region (Jones et al. 2007).

Ethnographic

Morro Bay was historically occupied by the Obispeño Chumash, so-called after their historic period association with Mission San Luis Obispo de Tolosa (Gibson 1983; Kroeber 1925).

Groups neighboring the Chumash included the Salinan to the north, the Southern Valley Yokuts and Tataviam to the east, and the Gabrielino (Tongva) to the south. Chumash place names in the project vicinity include Pismu (Pismo Beach), Tematatimi (along Los Berros Creek), and Tilhini (near San Luis Obispo) (Greenwood 1978).

Only a general outline of the lifeways of the Obispeño Chumash is known based on the little ethnographic information available (Greenwood 1978). Although their language was closer to Southern Chumash groups, the material culture and lifeways of the Northern Chumash appear to have been more similar to their northern neighbors, the Salinan. Accordingly, their populations in this area are thought to have been substantially lower than in the Santa Barbara Channel area, their villages smaller, and their livelihood less based on intensive use of marine fisheries (Glassow, Wilcoxen, and Erlandson 1988; Greenwood 1978).

Permanent Chumash villages included hemispherical dwellings arranged in close groups, with the chief having the largest for social obligations (Brown 2001). Each Chumash village had a formal cemetery marked by tall painted poles and often with a defined entrance area (Gamble, Walker, and Russell 2001). Archaeological studies have

identified separate sections for elite versus commoner families within the cemetery grounds (King 1969).

The acorn was a dietary staple for the mainland Chumash, though its dominance varied by coastal or inland location. Chumash diet also included cattail roots, fruits and pads from cactus, and bulbs and tubers of plants such as amole (Miller 1988). On the coast, the wooden plank canoe (tomol) was employed in the pursuit of marine mammals and fish. The tomol not only facilitated marine resource procurement but also facilitated an active trade network maintained by frequent crossings between the mainland and the Channel Islands.

Chumash populations were decimated by the effects of European colonization and missionization (Johnson 1987). Traditional lifeways largely gave way to laborer jobs on ranches and farms in the Mexican and early American periods. Today, the Santa Ynez Band of Chumash Indians is the only federally recognized Chumash tribe, though many people of Chumash descent continue to live throughout their traditional territory.

Historical

Post-European contact history for the state of California is generally divided into three periods: the Spanish period (1769–1822), the Mexican period (1822–1848), and the American period (1848–present).

The Juan Rodrigues Cabrillo expedition reached the San Luis Obispo region in 1542, possibly landed in Morro Bay, and sailed as far north as San Francisco Bay (Chesnut 1993). For more than 200 years, other Spanish, Portuguese, British, and Russian explorers sailed the Alta (upper) California coast and made limited inland expeditions, but they did not establish permanent settlements (Bean 1968; Rolle 2003). The earliest detailed descriptions of the area come from members of Gaspar de Portolá's land expedition, which passed through the region in 1769 (Squibb 1984). Early travelers in the Central Coast region reported seeing no large Native American villages like those noted in the Santa Barbara Channel area.

Gaspar de Portolá and Franciscan Father Junípero Serra established the first Spanish settlement in Alta California at Mission San Diego de Alcalá in 1769. This was the first of 21 missions erected by the Spanish between 1769 and 1823. Portolá continued north, passing through the project vicinity and reaching San Francisco Bay in 1769. Mission San

Luis Obispo de Tolosa was founded in 1772, the fifth of 21 missions established by the Spanish in Alta California. (Rolle 2003)

The Mexican period commenced when news of the success of the Mexican Revolution (1810-1821) against the Spanish crown reached California in 1822. This period was an era of extensive interior land grant development and exploration by American fur trappers west of the Sierra Nevada mountains. The California missions declined in power and were ultimately secularized in 1834. Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Gumprecht 1999).

The secularization of the missions during the Mexican period resulted in approximately 500,000 acres of former mission lands being granted to Mexican citizens in San Luis Obispo County (San Luis Obispo 2006). The City of Morro Bay contains portions of what were once the San Bernardo and the Moro y Cayucos land grants. Rancho San Bernardo was granted in 1840 to Vincent Cane, and Rancho Moro y Cayucos was granted in 1842 to Martin Olivera and Vicente Feliz (Shumway 2007).

The American period began with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico $15 million for the conquered territory, including California, Nevada, Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. Settlement of Southern California continued to increase during the early American period. Many ranchos in the county were sold or otherwise acquired by Americans, and most were subdivided into agricultural parcels or towns. Rancho San Bernardo was patented to Vincent Cane in 1865, and a patent was issued for Rancho Moro y Cayucos to James McKinley in 1878.

The County of San Luis Obispo was founded in 1850 (San Luis Obispo 2006). Roads were constructed throughout the county in the 1870s, primarily by Chinese laborers, leading to increased mobility throughout the county. In 1872, Captain John Harford began construction on the Pacific Coast Railway.

In 1864, Franklin Riley visited Morro Bay while traveling the coast. Riley knew that there was a pocket of public land between Don Canet's Rancho San Bernardo and the coast, so he decided to homestead this land, and in 1870 founded it as the City of Morro Bay. Few roads led to Morro Bay, so transportation relied on steamers. Riley built the Embarcadero and planned the town next to the bay to accommodate sea trade and

travel. Throughout the 1870s, the town grew rapidly because of trade along the Embarcadero (Hammond 2010).

Land development became very important in Morro Bay in the early 1900s, with several real estate developers promoting the city. During the 1920s, numerous housing developments were carved out of ranches and farms (Hammond 2010). The Morro Bay Power Plant was constructed in the 1950s, providing jobs and tax revenue. Morro Bay was incorporated as a general law city in 1964 and elected its first City Council.

In the early twentieth century Port Harford was renamed Port San Luis and oil from the Santa Maria and Taft-Coalinga fields was shipped beginning in 1907 and 1913, respectively. The California Polytechnic School was established in 1901 as a high school and eventually became California Polytechnic State University (Cal Poly). The county's agriculture and ranching production supplied US troops during World War I and helped its residents weather the Great Depression of the 1930s. At the start of World War II, the US War Department transferred nearly 100,000 military personnel to bases at Morro Bay, Camp San Luis, Camp Roberts, and Cambria.

PALEONTOLOGICAL RESOURCES BACKGROUND

Paleontological resources, also known as fossils, are the remains, traces, or imprints of once living organisms preserved in rocks or sediment. Paleontological resources are most commonly found in sedimentary rock units and are normally discovered in cliffs, ledges, steep gullies, or along wave-cut terraces where vertical rock sections are exposed. Fossils may be exposed by a trench, ditch, or channel during subsurface construction.

Paleontologists examine invertebrate fossil sites differently than vertebrate fossil sites. Invertebrate fossils in microscopic form such as diatoms, foraminifera, and radiolarians can be so prolific as to constitute major rock material in some areas. Invertebrate fossils normally are marine in origin, widespread, abundant, fairly well preserved, and predictable as to fossil locale. Therefore, the same or similar fossils can be located at numerous sites throughout Central California. Vertebrate fossil sites are usually found in nonmarine or continental deposits. Vertebrate fossils of continental material are usually rare, sporadic, and localized (SVP 2010).

Known Cultural and Paleontological Resources

Cultural Resources

According to the Office of Historic Preservation, there are no resources listed as California Points of Interest, and no resources in the City of Morro Bay were listed on the National Register of Historic Places or the California Register of Historical Resources. Policy 4.02 of the Local Coastal Plan calls for the City to develop and establish a cultural resources inventory, including both built-environment and archaeological resources. However, such an inventory has not yet been created. One resource, Morro Rock, is listed as a State Historical Landmark. Morro Rock, sometimes called the Gibraltar of the Pacific, has served as an important mariner's landfall, was noted by Cabrillo, and is mentioned in the diaries of Portolá (Arbuckle 1981). Morro Rock is considered sacred by the Chumash and Salinan peoples.

According to the City's existing General Plan, the Morro Bay area is sensitive for Native American cultural resources due to its proximity to the ocean, various streams, and abundance of food resources and raw materials. Most archaeological resources are not readily seen nor identified until grading or construction occurs.

Additionally, the development of the City of Morro Bay goes back to the 1800s, and the city likely contains built-environment resources over 45 years of age that may be considered significant or require further evaluation.

Paleontological Resources

Morro Bay lies at the tectonically active southern end of the Coast Ranges geomorphic province and so contains geologic units ranging in age from Jurassic to recent (CGS 2002) (Table 4.1). A list of the geologic units mapped at the surface within Morro Bay is presented in Table 4.2 and mapped in Figure 4.1. Most of the geologic units mapped within the limits of Morro Bay have not produced any fossils; however, the Pismo Formation and Pleistocene-aged alluvial deposits are known to contain significant paleontological resources.

A review of the University of California Museum of Paleontology's online collections database reveals six known vertebrate fossil localities (N=27 specimens) near Morro Bay from the Pismo Formation, although this formation does not occur within Morro Bay

itself. Quaternary older alluvium (Pleistocene-age), which is located in the city limits of Morro Bay, is highly sensitive for paleontological resources in California wherever it occurs (see Agenbroad 2003; Bell et al. 2004; Jefferson 1985, 1991; Merriam 1911; Reynolds et al. 1991; Savage, Downs, and Poe 1954; Scott and Cox 2008; Springer et al. 2009; Wilkerson, Elam, and Turner 2011; Winters 1954), though no records of fossil localities in the vicinity of Morro Bay were found in online museum databases or the published literature.

Table 4.1
Geologic Time Scale, City of Morro Bay

Era	Period	Epoch	Age (millions of years ago)1
Cenozoic	Quaternary	Holocene	Recent – 0.0117
		Pleistocene	0.0117 – 2.58
	Neogene (Tertiary)	Pliocene	2.58 – 5.33
		Miocene	5.33 – 23.03
	Paleogene (Tertiary)	Oligocene	23.03 – 33.9
		Eocene	33.9 – 56.0
		Paleocene	56.0 – 66.0
Mesozoic	Cretaceous	Lower/Upper	66.0 – 145.0
	Jurassic	Lower/Middle/Upper	145.0 – 201.3

[1]Numerical ages based on Global Boundary Stratotype Section and Points (GSSP) for their lower boundaries, as ratified by the International Commission on Stratigraphy. Rocks older than the Paleozoic have less secure upper and lower boundary dates.

[2]Epochs have not been named for rocks older than the Paleozoic.

Source: Cohen et al. 2013

Table 4-2
Geologic Units, City of Morro Bay

Major Rock Type	Geologic unit[1]	Description	Age
Sedimentary	(af) artificial fill	Human construction-related deposits, including engineered and nonengineered fill	Latest Holocene
Sedimentary	(Qa) Quaternary alluvial flood-plain deposits	Active and recently active floodplain deposits of cobbles, gravel, sand, and silt	Late Holocene
Sedimentary	(Qpe) Quaternary paralic estuarine deposits	Unconsolidated estuarine deposits of fine-grained sand and clay	Late Holocene

Major Rock Type	Geologic unit[1]	Description	Age
Sedimentary	(Qe, Qs) Quaternary eolian deposits	Unconsolidated, well-sorted white to brown windblown sand. Forms active dunes along west side of Morro Bay	Holocene
Sedimentary	(Qls) Quaternary landslide deposits	Highly fragmented to largely coherent landslide deposits	Holocene and Pleistocene
Sedimentary	(Qya) Quaternary young alluvial floodplain deposits, undivided	Unconsolidated sand, silt, and clay-bearing alluvium deposited on floodplains and along valley floors	Holocene and late Pleistocene
Sedimentary	(Qoa) Quaternary old alluvial floodplain deposits	Moderately consolidated, slightly dissected gravel, sand, silt and clay-bearing alluvium, capped by moderate to well-developed soils	Late to middle Pleistocene
Sedimentary	(Qoe) Quaternary old eolian deposits	Old stabilized sand dune deposits of moderately consolidated, well-sorted brown windblown sand, capped by moderately well-developed soils	Late to middle Pleistocene
Sedimentary	(Tp) Pismo Formation	Buff to light-brown well-bedded, relatively soft siltstone, shale, porcelaneous shale, opaline shale, diatomaceous shale, friable sandstone	Pliocene to Miocene
Igneous	(Toi) Tertiary porphyritic dacite of Morro Rock-Islay Hill intrusive complex	Porphyritic dacite with altered plagioclase, biotite, glass, quartz, and hornblende groundmass	Oligocene
Igneous	(Toif) Tertiary fine-grained dacite of Morro Rock-Islay Hill intrusive complex	Fine-grained dacite flows, with rare phenocrysts	Oligocene
Sedimentary	(KJfm) Franciscan Complex melange	Chaotic mixture of fragmented rock and metasandstone	Cretaceous to Jurassic
Sedimentary	(KJfch) Franciscan Complex chert	Red and green radiolarian chert	Cretaceous to Jurassic
Igneous/Metamorphic	(KJfmv) Franciscan Complex metavolcanics	Greenstone, pillow basalts	Cretaceous to Jurassic
Metamorphic	(Jos) Serpentinized ultramafic rocks	Peridotite, dunite, serpentinite	Jurassic

[1]*Rock unit abbreviation depends on geologic map source.*

Sources: Dibblee 2006a, 2006b; Wiegers 2009

MINERAL RESOURCES

The landscape of San Luis Obispo County contains a variety of mineral resources. Mining of copper and coal has occurred in the county since the mid-1800s, and chromite, manganese, and mercury were mined in the early 1900s. Quarrying on Morro Rock provided the materials for construction of a jetty to close the north entrance of the harbor and a breakwater to protect the south entrance. In recent years, the principal developed mineral resources of San Luis Obispo County have been gypsum, clay, natural gas, petroleum, mercury, construction stone, sand, and gravel. Of these, sand and gravel remain principal mineral resources to this day.

Based on a review of San Luis Obispo County GIS data and the Mineral Land Classification Map prepared by the State of California Division of Mines and Geology, there are no existing mineral extraction operations in Morro Bay. The state geologist has not designated a mineral resource area of statewide or regional significance pursuant to Sections 2710 et seq. of the Public Resources Code (the Surface Mining and Reclamation Act) in the city. Similarly, the County of San Luis Obispo has not designated any Extractive Resource Areas in or adjacent to the City of Morro Bay. According to the Division of Oil, Gas & Geothermal Resources well data, there are no existing or historic petroleum wells in the city.

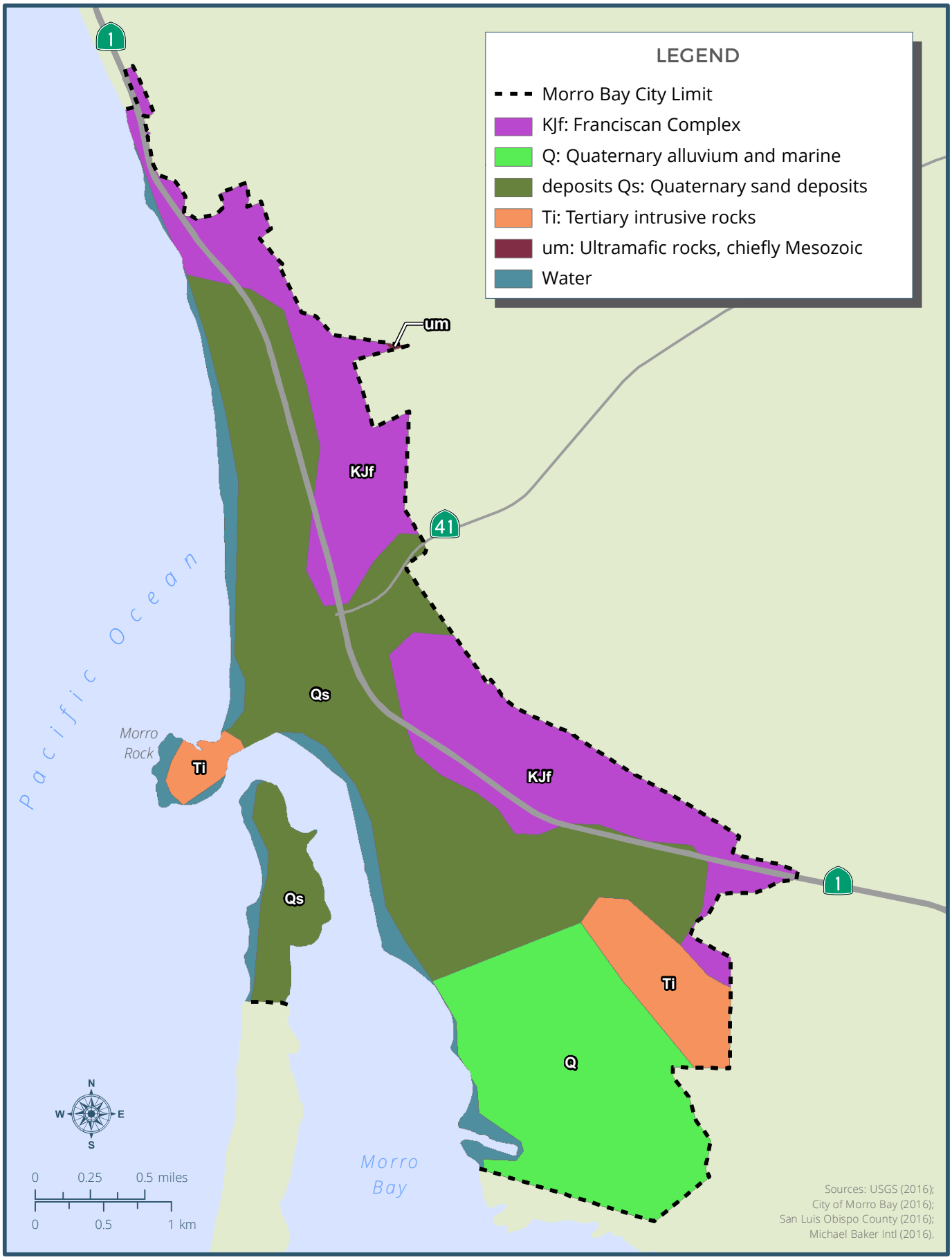


FIGURE 4.1

Geologic Units in the City of Morro Bay

Page 2

4.2 REGULATORY SETTING

FEDERAL

The definition of a federal undertaking in 36 Code of Federal Regulations (CFR) 800.16(y) includes projects requiring a federal permit, license, or approval. Cultural resources are considered during federal undertakings chiefly under Section 106 of the National Historic Preservation Act of 1966 (as amended) through one of its implementing regulations; 36 CFR 800 (Protection of Historic Properties); and the National Environmental Policy Act. Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the National Historic Preservation Act, and Section 106 of 36 CFR 800.3–800.10. Other federal laws include the Archeological Data Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of the National Historic Preservation Act (16 United States Code [USC] 470f) requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of any adversely affected historic property is assessed and mitigation measures are proposed to reduce any impacts to an acceptable level. Historic properties are those significant cultural resources that are listed in or are eligible for listing in the National Register of Historic Places per the criteria listed below (36 CFR 60.4):

> The quality of significance in American, state, and local history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> b) Are associated with the lives of persons significant in our past; or

c) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) Have yielded, or may be likely to yield, information important in prehistory or history.

STATE

The California Environmental Quality Act (CEQA) requires a lead agency to determine whether a project may have a significant effect on historical resources (Public Resources Code [PRC] Section 21084.1). If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a], [b], and [c]).

PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

A historical resource is a resource listed in, or determined to be eligible for listing, in the California Register of Historical Resources, a resource included in a local register of historical resources, or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (State CEQA Guidelines Section 15064.5[a][1-3]).

Section 15064.5(a)(3) also states that a resource shall be considered by the lead agency to be historically significant if the resource meets any of the following criteria for listing on the California Register of Historical Resources:

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

2) Is associated with the lives of persons important in our past.

3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

4) Has yielded, or may be likely to yield, information important in prehistory or history.

LOCAL

The existing City of Morro Bay Local Coastal Plan includes a number of policies related to archaeological resources within the city, but does not specifically address paleontological resources. Policies 4.01 through 4.08 include measures to protect the archaeological resources and guide actions which affect those resources within the city.

4.3 PRIORITY FINDINGS

CULTURAL RESOURCES

Significant or important cultural resources may exist within the limits of Morro Bay. Buildings, structures, or objects in Morro Bay that are over 45 years of age may be considered significant cultural resources. The City has not yet implemented Policy 4.02 of the Local Coastal Plan with regard to the establishment of an inventory of cultural resources.

ARCHAEOLOGICAL RESOURCES

Prehistoric or historic archaeological resources could be identified on the surface or subsurface of undeveloped areas or in the subsurface of developed areas. Efforts to identify these resources and measures to preserve them should be considered. The City has not yet implemented Policy 4.02 of the Local Coastal Plan with regard to the creation of an archaeological sensitivity map.

PALEONTOLOGICAL RESOURCES

Portions of the City of Morro Bay include geological formations that may contain fossils. Opportunities for protecting paleontological resources can generally be incorporated as specific measures on a project-by-project basis, when evaluated by a qualified paleontologist.

5.0 Economic Conditions and Market Trends

Plan MORRO BAY

5.0 ECONOMIC CONDITIONS AND MARKET TRENDS

This chapter identifies existing demographic and economic conditions, as well as market trends in the planning area.

5.1 EXISTING CONDITIONS[1]

ECONOMIC SCAN

This section provides an overview of the existing socioeconomic characteristics of Morro Bay residents. [2]

Demographics

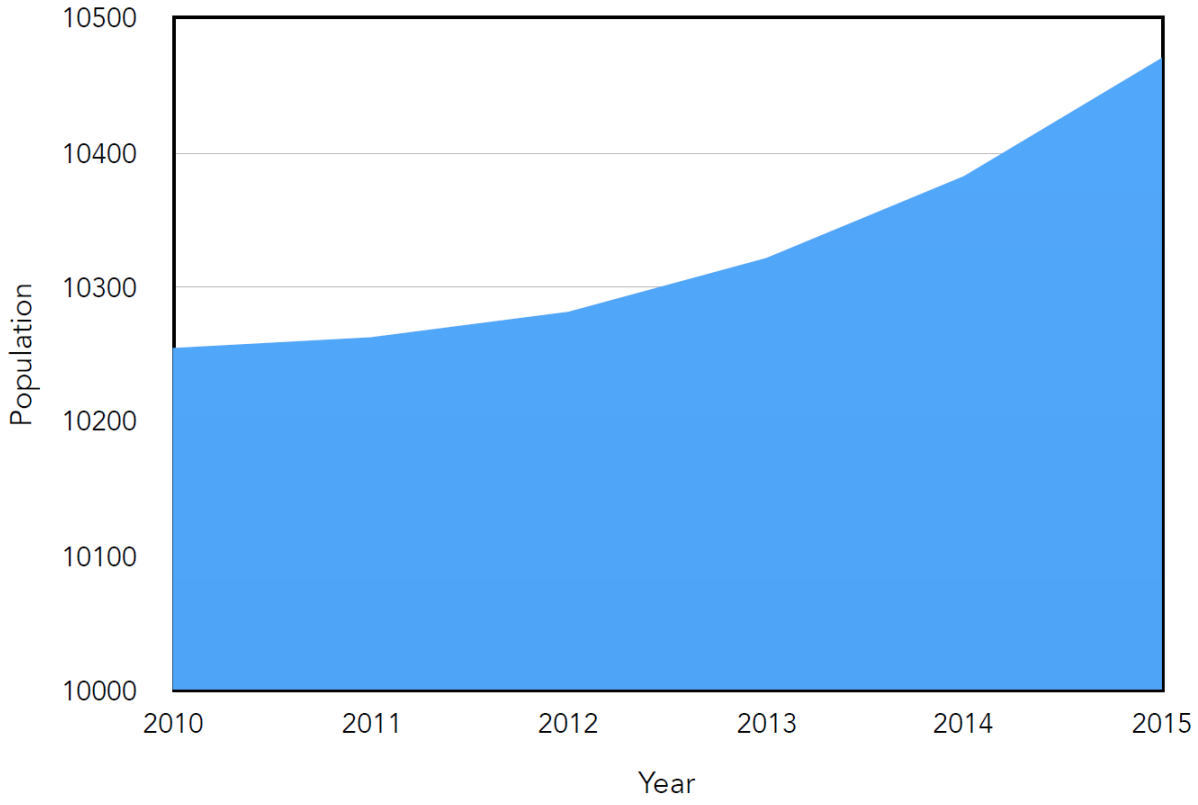
The population of Morro Bay has grown slowly since 2010, based on 2010 Census data and 2015 population estimates by the California Department of Finance (Figure 5.1).

[1] The content of this chapter originates from a background report generated in support of the Morro Bay Economic Development Strategic Plan by Chabin Concepts. The content has been lightly edited.

[2] For greater transparency around some of the data used in this report as provided by the US Census Bureau, the Census Bureau reports some data as having a margin of error with a 90 percent confidence interval. For example, the Census Bureau reports the median age of Morro Bay as 49.2 years with a margin of error of 3.2 years; this means there is a 90 percent chance that Morro Bay's median age falls between 46.0 and 52.4 years (49.2 years, plus or minus the margin of error of 3.2 years). There is a 10 percent chance that Morro Bay's median age falls outside this range. Some graphs and tables in this report may indicate the range of the 90 percent confidence interval rather than providing a single value.

Additionally, some data showing a comparison between two or more points may include a probability of significance. This measurement indicates whether the observed difference is meaningful, or whether it is an insignificant fluctuation due to random changes and estimates. In these cases, a statistic known as a "p-value" has been calculated. If the p-value of the data is below 0.1, the difference is considered statistically significant. If the p-value is equal to or greater than 0.1, the difference is not statistically significant.

Figure 5.1
Morro Bay Population (2010–2015)



Source: CA Department of Finance, Demographic Research Unit, May 2016 E-4 Population Estimates for 2010 and 2015

In terms of projected growth, the city is expected to add several hundred new residents by 2020, resulting in an annual growth rate of 0.7 percent between 2015 and 2020. Morro Bay's population is expected to increase from 10,640 in 2015 to 11,005 by 2020 (Table 5.1).

Table 5.1
Population Growth (2010–2020)

	Morro Bay	California
Historical Population		
2010	10,234	37,253,956
2015	10,640	38,907,642
Annual Average Percent Change (Historic)	0.8%	0.9%
Future Population		
2020	11,005	40,619,346
Annual Average Percent Change (Projected)	0.7%	0.9%

Source: CA Department of Finance, Demographic Research Unit, May 2016 E-4 Population Estimates for 2010 and 2015; P-1 State and County Population Projections 2010–2060

The distribution of population by age reveals that Morro Bay has a significantly older population than the state as a whole. About 23 percent of the population is over 65, compared to only 12 percent of the state population.

There is also a lower share of people under 18 in Morro Bay compared to the state. This is reflected in a significantly higher median age of 49.2, versus 35.8 for the state as a whole. Sustaining a vital and growing community will be a greater challenge given the community's aging demographics.

Despite differences in the youth and senior cohorts, the share of the population that is of working age (25 to 64) is similar to the state average, at 54 percent for Morro Bay and 53 percent for the state. This is important in terms of having a sufficiently sized workforce to support economic development. Because of the very tight housing market in the City of San Luis Obispo, university employees and other workers are forced to find housing in neighboring communities, such as Morro Bay, which may boost the working age population.

Figure 5.2 and Table 5.2 show the age distribution in Morro Bay compared to California.

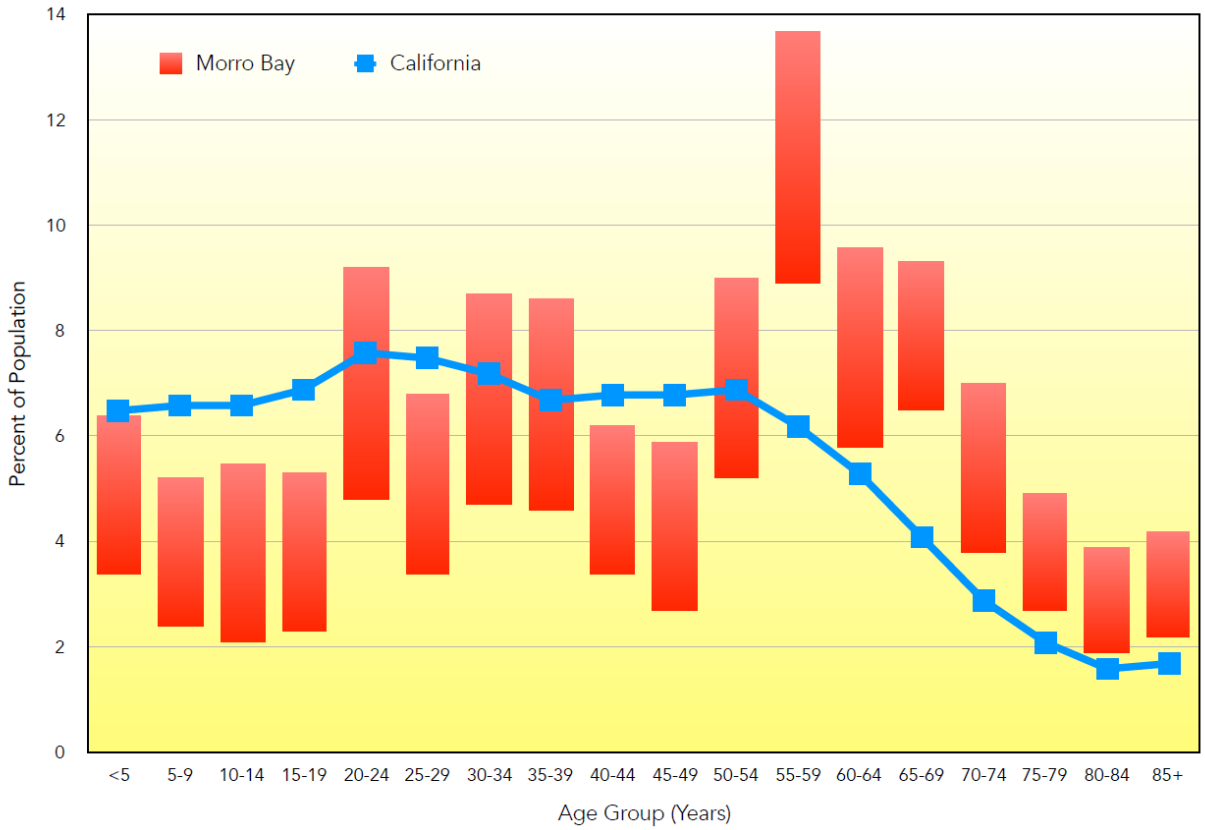
Table 5.2
Age Distribution (2010–2015)

	Morro Bay			California		
	2010	**2015[3]**	**Average Annual Change**	**2010**	**2015**	**Average Annual Change**
Total	10,234	10,640	0.8%	37,253,956	38,907,642	0.9%
Under 20	1,341	1,734	5.9%	10,617,377	10,349,433	-0.5%
20-34	1,627	2,000	4.6%	8,084,108	8,676,404	1.5%
35-54	2,303	2,426	1.1%	10,580,124	10,582,879	<0.1%
55-64	1,863	2,022	1.7%	3,837,157	4,474,379	3.3%
65 & Over	3,101	2,458	-4.1%	4,135,189	4,824,548	3.3%
Share of Population 25 to 64	51%	54%		53%	53%	
Population Under 18	12%	15%		25%	24%	
Population Over 65	31%	23%		11%	12%	
Median Age	54.1	49.2		34.9	35.8	

Source: US Census Bureau, American Community Survey 2010 and 2015 5-year estimates; CA Department of Finance, Demographic Research Unit (total population) May 2016 E-4 Population Estimates for 2010 and 2015

[3] The data used in this table is derived from the American Community Survey, which estimates population using samples with relatively large margins of error. Population totals vary from the 10,640 figure reported in Table 5.1. This information is best used to identify relative proportions of population sub-categories (in this case, age groups). American Community Survey data was used to determine the percent of persons in each age group, which was multiplied by the total population figures reported in Table 5.1 to calculate the number of persons in each age group.

Figure 5.2
Morro Bay and California Age Distribution (2015)



Source: US Census Bureau, American Community Survey 2010 and 2015 5-year estimates

Diversity is another important factor in terms of attracting both companies and workers. The population of Morro Bay is significantly less diverse than the state as a whole (Table 5.3). The lack of diversity may be a drawback for some companies that are looking for a diverse workforce.

Table 5.3
Race and Ethnicity (2010–2015)

	Morro Bay				California			
	2010		2015[4]		2010		2015	
Total	10,234	100.00%	10,640	100.0%	37,253,956	100.0%	38,907,642	100.0%
White	9,712	87.10%	9,778	91.9%	22,762,167	61.1%	24,044,923	61.8%
Black or African American	0	0.40%	181	1.7%	2,272,491	6.1%	2,295,551	5.9%
American Indian	72	0.90%	106	1.0%	298,032	0.8%	272,353	0.7%
Asian or Pacific Islander	246	2.60%	202	1.9%	4,954,776	13.3%	5,485,978	14.1%
Other Race	133	1.3%	202	1.9%	5,550,839	14.9%	5,019,086	12.9%
Two or more Races	72	0.7%	170	1.6%	1,415,650	3.8%	1,789,752	4.6%
Hispanic Origin	1,167	11.4%	1,766	16.6%	13,672,202	36.7%	14,855,448	38.2%

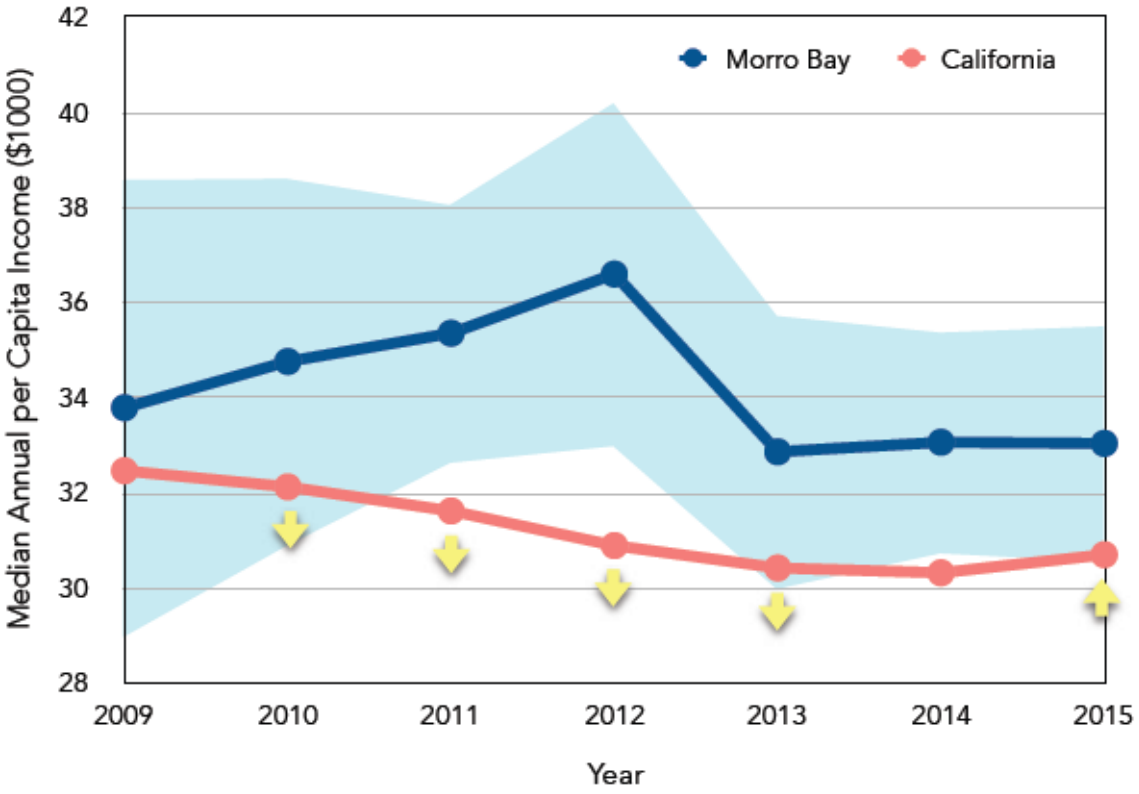
Source: US Census Bureau, American Community Survey 2010 and 2015 5-year estimates; CA Department of Finance, Demographic Research Unit (total population) May 2016 E-4 Population Estimates for 2010 and 2015.

Median household income is a general measure of standard of living as well as a measure of the typical wage and skill levels. Morro Bay has a lower household income than the state, and household income has declined from 2010 to 2015 (although per capita income has increased). It is important to point out that median incomes may be impacted by the age structure of the population, as retiree households often have significant savings and lower annual incomes than working age households.

Per capita income in Morro Bay is about 8 percent higher than the state average for 2015 (Figure 5.3).

[4] The data used in this table is derived from the American Community Survey, which estimates population using samples with relatively large margins of error. Population totals vary from the 10,640 figure reported in Table 5.1. This information is best used to identify relative proportions of population sub-categories (in this case, racial and ethnic groups).

Figure 5.3
Income Comparison Adjusted for Inflation (2009–2015)



Blue shaded area represents the 90% confidence interval for Morro Bay data.

90% confidence intervals for all California data is less than $200 and is too small to illustrate at this scale.

Yellow arrows indicate a significant ($p<0.10$) increase or decrease from previous year.

US Census Bureau, American Community Survey 2010 and 2015 5-year estimates

Housing

Morro Bay has a slightly larger share of renter-occupied housing than the state as a whole, which may be due in part to demand from students at California Polytechnic State University, San Luis Obispo (Cal Poly). In addition, because Morro Bay is a tourist destination, a large number of seasonal residents are reflected in the number of seasonal use housing units. About 20 percent of the total housing inventory consists of units held for seasonal use, compared to only 3 percent of the housing inventory statewide (Table 5.4). According to the 2000 Census, there were 5,006 housing units in Morro Bay. In 2000 there were a total of 1,280 vacant units and 1,069 (about 21 percent of total inventory) of those were for seasonal use. This segment of the Morro Bay housing stock has remained at about the same percentage of total units between 2000 and 2014 (City of Morro Bay 2009).

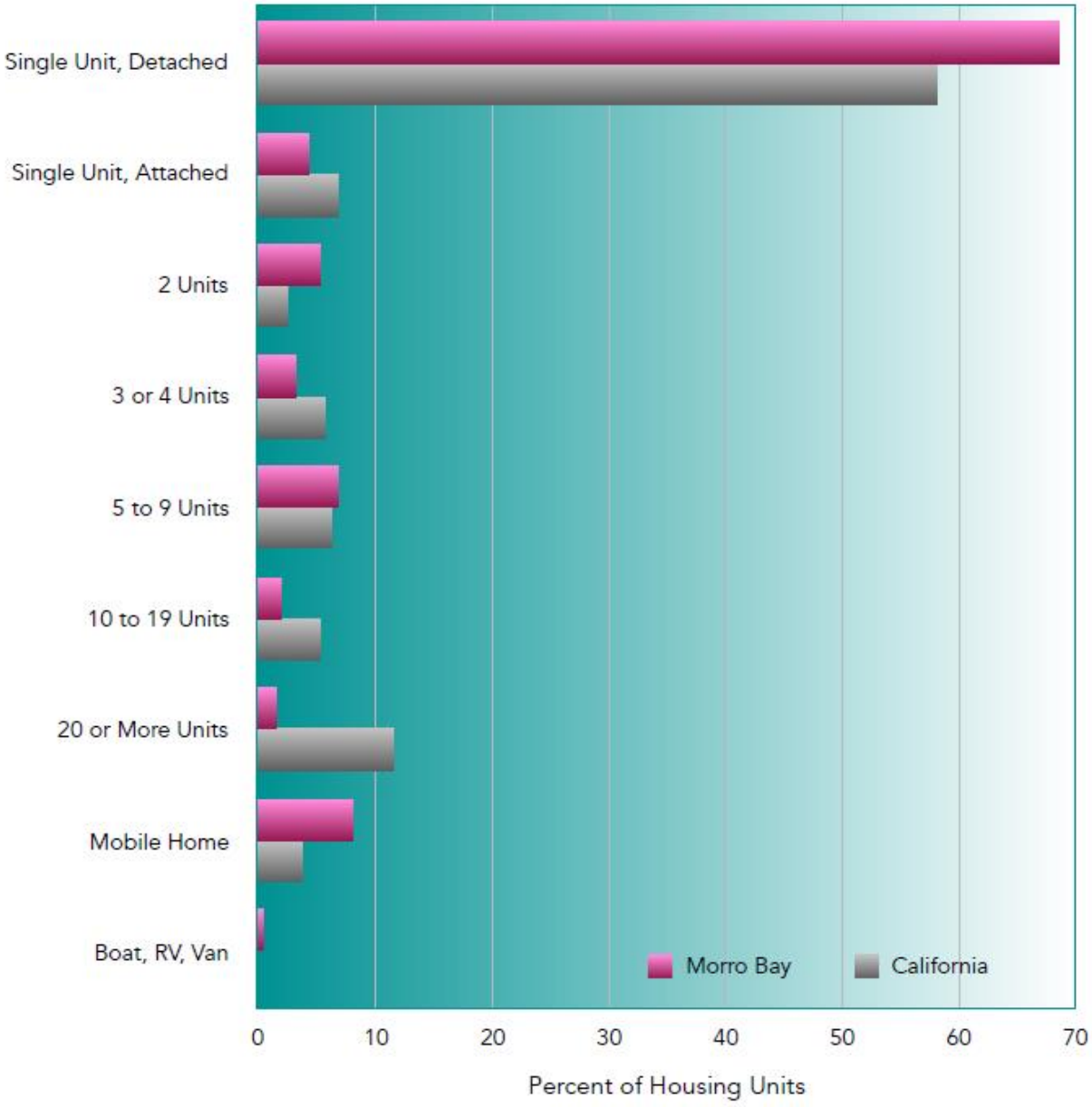
Table 5.4
Housing Inventory (2014)

	Morro Bay	California
Total Housing Units	6,421	13,845,790
Occupied	4,933	12,717,801
Owner	2,321	6,909,176
Renter	2,612	5,808,625
Percent Renter Occupied (as a percent of occupied units)	52.9%	45.7%
Vacant	1,488	1,127,989
Vacant for Seasonal Use	1,292	367,882
Other Vacant	102	299,493
Percent Seasonal Use Units (as a percent of vacant units)	86.8%	32.6%
Percent Seasonal Use Units (as a percent of all units)	20.1%	2.7%

Source: US Census Bureau, American Community Survey 2015 5-year estimates. Basis for percent renter occupied is total occupied units while the basis for percent vacant for seasonal use is total vacant units.

Figure 5.4 shows the different types of housing units in Morro Bay by the number of units in the structure. In Morro Bay, 68 percent of the housing units are single-family detached homes, while attached single-family homes are another 4 percent of the housing stock. Multi-family units (those in buildings of at least two units) constitute 19 percent and mobile homes make up 8 percent of the city's housing stock ().

Figure 5.4
Occupied Housing Units by Type (2015)



All differences shown are statistically significant ($p<0.10$) except for the categories "5 to 9 Units" and "Boat, RV, Van"

Source: US Census Bureau, American Community Survey 2015 5-year estimates.

Housing Affordability by Income Level

Housing affordability can be inferred by comparing the cost of renting or owning a home with the maximum affordable housing cost to households at different income levels. The area median income provides a benchmark for estimating the affordability of housing and the ability of newcomers to move into the community. Taken together, this information can generally demonstrate who can afford what size and type of housing and indicate the type of households most likely to experience overcrowding or a burden on housing cost (City of Morro Bay 2014).

In evaluating affordability, the maximum affordable price refers to the maximum amount that could be afforded by households in the upper range of their respective income category. Households in the lower end of each category can afford less in comparison. The maximum affordable home and rental prices for residents of San Luis Obispo County are shown in Table 5.5. The affordability of the county's housing stock for each income group is discussed below. HCD identified the 2014 county area median income to be $77,000 for a family of four (City of Morro Bay 2014).

Table 5.5 shows the maximum rents and sales prices that are affordable to extremely low-, very low-, low-, and moderate-income households. Affordability is based on the following assumptions: a household spending 30 percent or less of its total household income for shelter; the maximum household income levels established by HCD and the US Department of Housing and Urban Development; and maximum affordable sales prices based on 10 percent down with a 30-year fixed rate mortgage at a 5.75 percent annual interest rate (City of Morro Bay 2014).

Table 5.5
Housing Affordability by Income Level

Household Size	1	2	3	4	5	6
Extremely Low Income (Households at 30% of Median Income)						
Annual Income	$15,850	$18,100	$20,350	$22,600	$24,450	$26,250
Maximum Monthly Gross Rent[1]	$396	$453	$509	$565	$611	$656
Maximum Purchase Price[2]	$48,880	$59,141	$67,000	$74,460	$80,630	$86,460
Very Low Income (Households at 50% of Median Income)						
Annual Income	$26,400	$30,200	$33,950	$37,700	$40,750	$43,750
Maximum Monthly Gross Rent[1]	$660	$755	$849	$943	$1,019	$1,094
Maximum Purchase Price[2]	$86,400	$99,750	$111,230	$123,120	$133,340	$143,830
Low Income (Households at 80% of Median Income)						
Annual Income	$42,250	$48,250	$54,300	$60,300	$65,150	$69,950
Maximum Monthly Gross Rent[1]	$1,056	$1,206	$1,358	$1,508	$1,629	$1,749
Maximum Purchase Price[2]	$138,20	$157,930	$179,050	$198,390	$215,160	$230,960
Moderate Income (Households at 120% of Median Income)						
Annual Income	$64,700	$73,900	$83,150	$92,400	$99,800	$107,200
Maximum Monthly Gross Rent[1]	$1,618	$1,848	$2,079	$2,310	$2,495	$2,680
Maximum Purchase Price[2]	$210,120	$242,620	$251,780	$274,000	$327,230	$345,900

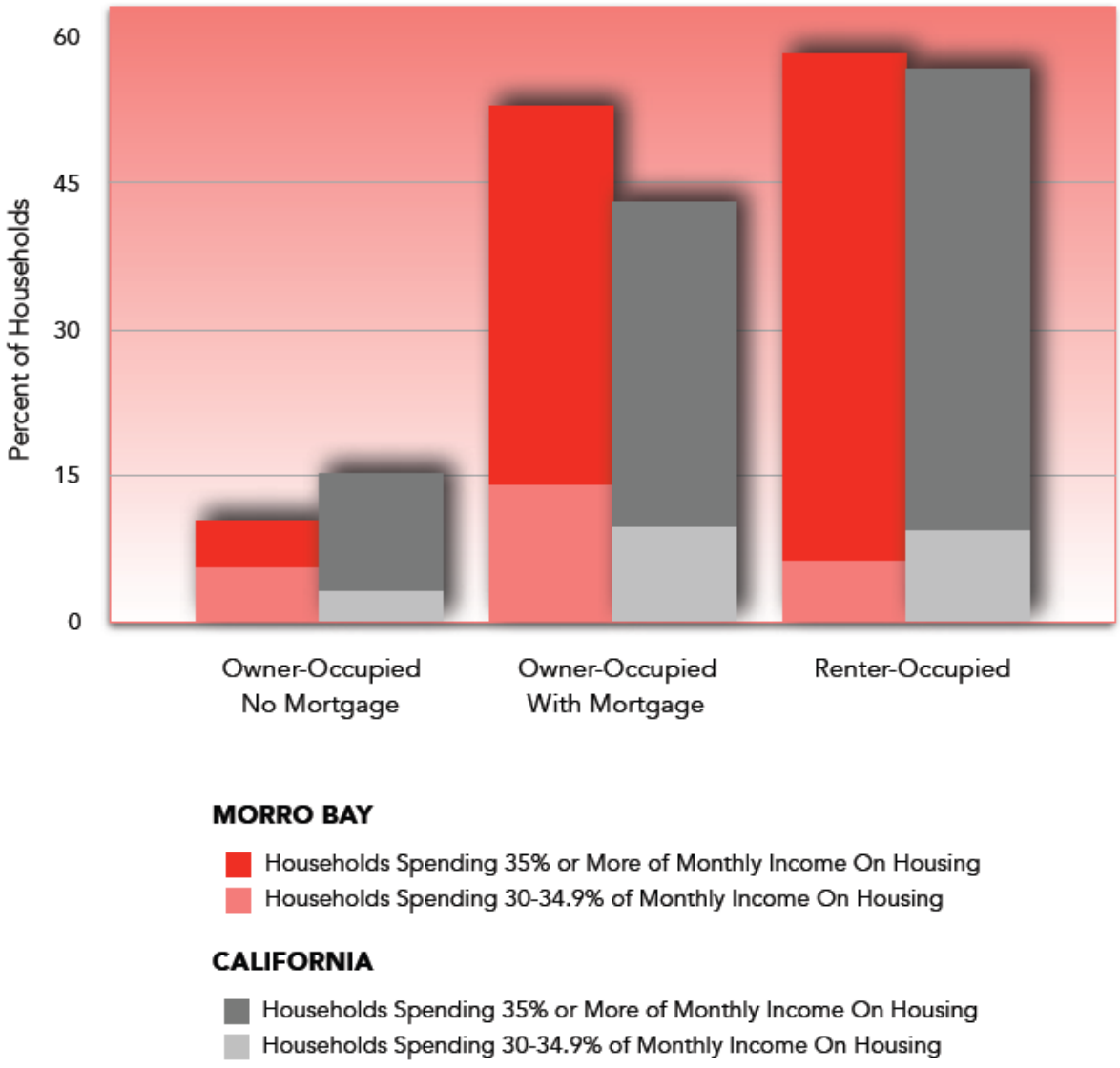
Source: 2014 Income Limits: Department of Housing and Community Development. Monthly mortgage calculation: http://www.realtor.com/home-finance/financial-calculators/home-affordability-calculator.aspx?source=web

1 Affordable housing cost for renter-occupied households assumes 30% of gross household income, not including utility cost.

2 Affordable housing sales prices are based on the following assumed variables: approximately 10% down payment, 30-year fixed rate mortgage at 5.75% annual interest rate.

Federal guidelines recommend that households spend no more than 30 percent of their monthly gross income on housing costs. More than half of Morro Bay renters and homeowners with a mortgage pay at least 30 percent of their monthly income on housing costs (Figure 5.5). These numbers are not statistically different from the statewide figures, and show that Morro Bay's challenges with housing affordability reflect the challenges seen at the statewide level.

Figure 5.5
Households Spending More Than 30% of Income on Housing (2013)



Source: US Census Bureau, American Community Survey 2010 and 2015 5-year estimates

Homelessness

Approximately 6 percent of homeless persons in San Luis Obispo County are in Morro Bay, and almost all of Morro Bay's homeless persons are unsheltered (Table 5.6). The largest populations of homeless persons in San Luis Obispo County are in San Luis Obispo, Paso Robles, and Atascadero.

Table 5.6
Homeless Population (2015)

Community	Sheltered	Unsheltered	Total
Morro Bay	4	87	91
Other coastal cities (Arroyo Grande, Grover Beach, and Pismo Beach)	41	174	215
San Luis Obispo	152	312	464
Inland cities (Atascadero and Paso Robles)	147	387	534
Unincorporated areas	48	163	211
Total	392	1,123	1,515

Source: San Luis Obispo County Homeless Point-In-Time Census & Survey 2015

Educational Attainment

The majority of jobs created in the United States over the next 10 years will require some post-high school education. Communities with capacity for growth are those that are able to attract and retain knowledge workers.

"Educational attainment" measures the highest degree generally attained by the adult population. In Morro Bay, about 46 percent of the adult population has an associate's degree or higher, compared to only 39 percent of the population in the state as a whole, and 37 percent nationally. Morro Bay also has a statistically significantly larger percent of the population with a bachelor's degree, and a statistically significantly smaller percent of the population without a high school diploma, relative to California at large (Table 5.7). This is likely due to the proximity to Cal Poly and the number of faculty members that live in the community. However, it also benefits the community in terms of economic development potential.

Table 5.7
Educational Attainment (2015)

	Morro Bay		California	
	Number	Percent	Number	Percent
Total Population (25+ Years)	8,036		25,257,858	
Less Than 9th Grade	355	4.4%	2,532,521	10.0%
9th to 12th Grade, No Diploma	351	4.4%	2,067,120	8.2%
High School Graduate	1,514	18.8%	5,231,824	20.7%
Some College	2,142	26.7%	5,516,887	21.8%
Associate's Degree	717	8.9%	1,970,322	7.8%
Bachelor's Degree	1,857	23.1%	5,002,596	19.8%
Graduate or Professional Degree	1,100	13.7%	2,936,588	11.6%
High School Graduate	7,330	91.2%	20,658,217	81.8%
College or Graduate Degree	3,674	45.7%	9,909,506	39.2%

Source: US Census Bureau, American Community Survey 2015 5-year estimates

Educational attainment appears to be highest among 35 to 44 year olds in Morro Bay, who tend to be more educated than both younger and older generations. The share of 25 to 34 year olds in the community with a bachelor's degree or higher is below the state average, while the educational attainment of all older cohorts is above the state average (Table 5.8). This indicates that the younger residents who are attracted to the community, or remain in the community after high school, are likely to be less educated.

Table 5.8
Educational Attainment by Age Cohort (2015)

	High School Graduate		Bachelor's Degree or Higher	
	Morro Bay	California	Morro Bay	California
25-34 Years	88.4%	85.7%	26.7%	32.6%
35-44 Years	84.7%	80.8%	43.2%	33.6%
45-64 Years	95.7%	81.7%	35.2%	30.9%
65 Years+	90.0%	78.5%	40.9%	28.8%

Source: US Census Bureau, American Community Survey 2015 5-year estimates

Workforce

The labor force includes both individuals who are employed as well as those who are unemployed and actively looking for work. From 2010 to 2015, Morro Bay's labor force has remained flat without any statistically significant changes, while the statewide labor force has grown by about 4 percent.

However, unemployment rates are very low in Morro Bay at only 3.9 percent, well below the statewide average of 6.2 percent. Morro Bay's economy was less impacted by the recession than other communities in the state. Unemployment in Morro Bay peaked at 7.9 percent in 2010 during the recession when the state was experiencing unemployment levels over 12 percent. Communities with higher educational attainment are often less impacted during recessionary periods.

In terms of employment, there has been modest growth since 2010 and Morro Bay is now above pre-recession employment levels. The state as a whole has actually seen significant increases in employment since 2010.

The labor force participation rate is a measure of the share of the population that is working or seeking work. Because the participation rate includes both employed and unemployed persons, it is a better metric for indicating the potential pool of workers.

In both Morro Bay and California, the workforce participation rate declined slightly from 2010 to 2015, although in Morro Bay there were steady increases through 2013, followed by a drop in 2014 and a slight rebound in 2015. The participation rate for 2015 is 63 percent in Morro Bay, compared to 65 percent statewide. Because participation rates were similar to the state, the decline in Morro Bay in 2014 may have been a temporary anomaly (Table 5.9).

Table 5.9
Labor Force and Employment (2010–2015)

	2010	2011	2012	2013	2014	2015	Change 2010–2015
Total Labor Force							
Morro Bay	5,600	5,700	5,800	5,800	5,500	5,600	0.0%
California	18,329,776	18,477,242	18,631,961	18,602,210	18,855,659	18,934,459	3.3%
Employment							
Morro Bay	5,200	5,200	5,500	5,500	5,200	5,400	3.8%
California	16,116,806	16,440,200	16,848,797	17,120,891	17,578,188	17,842,877	10.7%
Unemployment Rate							
Morro Bay	7.9%	7.5%	6.4%	5.2%	4.8%	3.9%	-50.6%
California	12.1%	11.0%	9.6%	8.0%	6.8%	5.8%	-52.2%
Labor Force Participation Rate (population age 18+)							
Morro Bay	62.3%	64.1%	64.2%	65.5%	62.0%	62.6%	0.5%
California	67.2%	66.8%	66.5%	65.4%	65.3%	64.7%	-3.7%

Source: Labor Force, Employment and Unemployment Rates from CA Employment Development Department, LMI Resources data for 2010–2015; population aged 18+ from the US Census Bureau, American Community Survey, 2010–2015

To understand Morro Bay's competitive position as a place to do business, it is important to understand in greater detail the types of skill sets represented in the resident workforce. Morro Bay has a higher share of workers in food preparation, architecture and engineering, building maintenance, and education occupations (among others) than the state as a whole. The share of residents in higher skilled occupations, such as management, science, and computers, is similar to the state average (Table 5.10).

This is indicated by the distribution of employment by occupation and by occupational location quotients that measure the share of employment in a particular occupation locally as compared to the state. A location quotient greater than one indicates a local specialization. The highest location quotients for Morro Bay are in architecture and engineering, community and social services, arts and entertainment, and building and grounds cleaning and maintenance. The lowest location quotients are in material moving, farming/fishing/forestry, protective services and legal occupations, where Morro Bay has only 51 percent or less of the normal share of these occupations.

Table 5.10
Resident Employment by Occupation (2015)

Occupations	Morro Bay		California		Location Quotient
	Employment	Distribution	Employment	Distribution	
Total	4,989		17,246,360		
Management, business and financial occupations	700	14%	2,610,836	15%	0.93
Computer and mathematical occupations	121	2%	538,724	3%	0.78
Architecture and engineering	202	4%	369,446	2%	1.89
Life, physical, and social science	53	1%	179,690	1%	1.02
Community and social services	119	2%	263,112	2%	1.56
Legal occupations	24	<0%	214,180	1%	0.39
Education, training, and library occupations	386	8%	940,369	5%	1.42
Arts, design, entertainment, sports, and media	227	5%	476,612	3%	1.65
Health practitioners and technologists	191	4%	840,815	5%	0.79
Healthcare support occupations	54	1%	346,284	2%	0.54
Protective services	54	1%	366,025	2%	0.51
Food preparation and serving	375	8%	973,459	6%	1.33
Building and grounds cleaning and maintenance	423	8%	750,210	4%	1.95
Personal care and service	176	4%	801,605	5%	0.76
Sales and related occupations	486	10%	1,888,333	11%	0.89
Office and administrative support	728	15%	2,201,552	13%	1.14
Farming, fishing, and forestry	40	1%	285,817	2%	0.48
Construction and extraction	127	3%	810,978	5%	0.54
Installation, maintenance, and repair	123	2%	484,026	3%	0.88
Production	200	4%	890,471	5%	0.78
Transportation	114	2%	552,342	3%	0.71
Material moving	66	1%	461,474	3%	0.49

Source: US Census Bureau, American Community Survey, 2015 5-year estimates

Similar data is available describing the resident workforce by industry (versus by occupation). Morro Bay has a higher than average share of workers in educational services, and arts and entertainment, for example, which is reflective of the tourism-based economy and the proximity to Cal Poly. Morro Bay has a substantially lower than average share of workers in certain fields such as manufacturing and finance/insurance. Note that this data is for the workforce living in Morro Bay, versus employers in Morro Bay (Table 5.11).

Table 5.11
Employment by Sector (Place of Residence) (2015)

Occupations	Morro Bay		California		Location Quotient
	Employment	Distribution	Employment	Distribution	
Total	4,989		17,246,360		
Agriculture	58	1%	379,780	2%	0.53
Mining	0	0%	33,170	<1%	0
Construction	245	5%	1,029,140	6%	0.82
Manufacturing	228	5%	1,687,092	10%	0.47
Wholesale Trade	95	2%	527,004	3%	0.62
Retail Trade	560	11%	1,910,340	11%	1.01
Transportation & Warehousing	190	4%	675,218	4%	0.97
Utilities	63	1%	133,396	1%	1.63
Information	183	4%	495,819	3%	1.28
Finance, Insurance & Real Estate	199	4%	1,075,345	6%	0.64
Professional & Scientific Services	376	8%	1,375,088	8%	0.95
Management of Companies	0	0%	11,183	<1%	0
Administrative & Support Services	210	4%	832,786	5%	0.87
Educational Services	751	15%	1,459,399	8%	1.78
Health Care	607	12%	2,156,957	13%	0.97
Arts, Entertainment, Recreation	370	7%	460,645	3%	2.78
Accommodation and Food Services	438	9%	1,303,484	8%	1.16
Other Services	253	5%	925,941	5%	0.94
Public Administration	163	3%	774,573	4%	0.73

Source: US Census Bureau, American Community Survey, 2015 5-year estimates

Employment by industry sector reflects employment by place of work, not by place of residence. The distribution of employment by industry is somewhat different in Morro Bay than in the state as a whole. Morro Bay has a greater share of employment in hospitality-related sectors (retail, accommodations, and food service). However, the city has a lower share of employment than the state in many other sectors, indicating a potential lack of diversity in the local economy (Table 5.12).

Table 5.12
Private Employment by Sector (Place of Work) (2014)

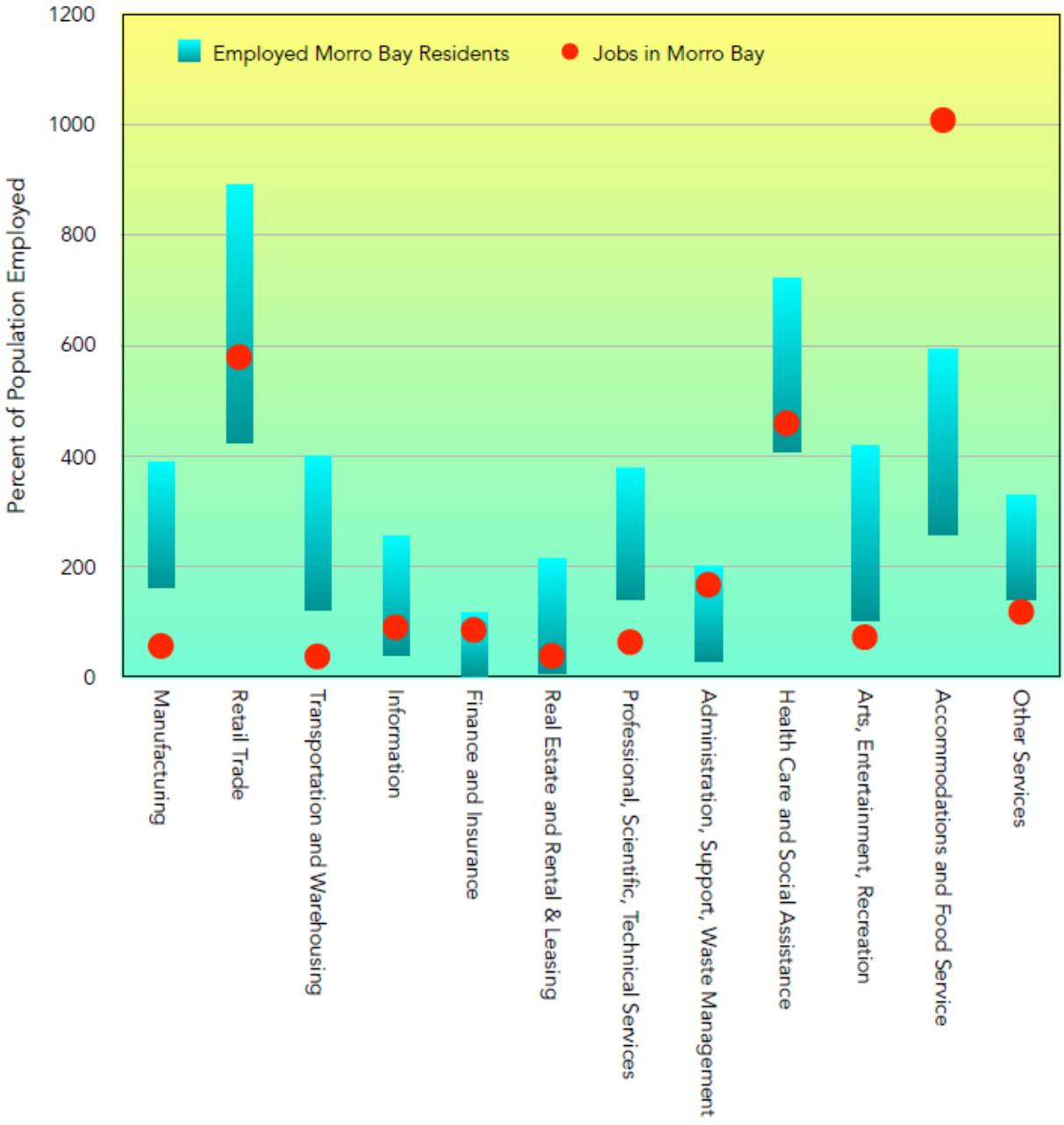
Industry	Morro Bay					California					City Location Quotient
	Employment			Distribution		Employment			Distribution		
	2010	2016	Change	2010	2016	2010	2016	Change	2010	2016	
Total	3,200	3,828	20%	100%	100%	14,665,400	16,637,225	13%			
Agriculture, Forestry & Fishing	42	44	5%	1%	1%	384,600	379,875	-1%	3%	2%	0.50
Mining	0	0	0%	0%	0%	25,100	23,975	<1%	<1%	<1%	0.00
Utilities	44	90	105%	1%	2%	57,700	58,450	1%	<1%	<1%	6.69
Construction	162	208	28%	5%	5%	559,800	740,925	32%	4%	4%	1.22
Manufacturing	106	96	-9%	3%	3%	1,244,000	1,275,525	3%	8%	8%	0.33
Wholesale Trade	25	26	4%	1%	1%	644,000	730,900	13%	4%	4%	0.15
Retail Trade	473	505	7%	15%	13%	1,517,700	1,665,925	10%	10%	10%	1.32
Transportation & Warehousing	113	34	-70%	4%	1%	408,600	499,500	22%	3%	3%	0.30
Information	31	38	23%	1%	1%	429,000	491,225	15%	3%	3%	0.34
Finance, Insurance & Real Estate	170	287	69%	5%	7%	759,700	800,725	5%	5%	5%	1.56
Professional & Scientific Services	74	77	4%	2%	2%	1,015,300	1,236,125	22%	7%	7%	0.27
Management of Companies	7	6	-14%	0%	0%	198,600	232,850	17%	1%	1%	0.11
Administrative & Support Services	257	392	53%	8%	10%	863,000	1,053,575	22%	6%	6%	1.62
Educational Services	6	5	-17%	0%	0%	291,000	367,850	26%	2%	2%	0.06

Industry	Morro Bay					California					City Location Quotient
	Employment			Distribution		Employment			Distribution		
Health Care & Social Assistance	287	445	55%	9%	12%	1,832,400	2,158,175	18%	12%	13%	0.90
Arts, Entertainment & Recreation	60	56	-7%	2%	1%	243,400	291,200	20%	2%	2%	0.84
Accommodation & Food Services	881	1,085	23%	28%	28%	1,258,200	1,563,300	24%	9%	9%	3.02
Other Services	388	334	-14%	12%	9%	484,900	546,975	13%	3%	3%	2.65
Government	60	65	8%	2%	2%	2,448,400	2,520,150	3%	17%	15%	0.11
Unclassified	14	35	150%	0%	1%	na	na	na	na	na	na

Source: California Employment Development Department 2016

In general, there is not a sufficient number of jobs within Morro Bay for several economic sectors. This is predominantly the case for jobs in the manufacturing, transportation/warehousing, professional/scientific, arts/entertainment/recreation, and other services sectors (Figure 5.6). On the other end of the spectrum, there are more jobs in the Accommodations and Food Service sector than the number of Morro Bay residents employed in that sector, so a significant portion of those jobs are filled with non-Morro Bay residents.

Figure 5.6
Resident Employment and Local Jobs (2014)



Source: US Census Bureau, American Community Survey, 2015 5-year estimates; US Economic Census 2012

The California Employment Development Department produces an Occupational Employment and Wage Data spreadsheet by metropolitan statistical area (MSA) yearly. Table 5.13 shows employment projections from 2010 through 2020 as related to job

growth for the San Luis Obispo-Paso Robles MSA, which includes Morro Bay. During the next four years, the San Luis Obispo-Paso Robles MSA expects new employment to be concentrated in a variety of occupations (City of Morro Bay 2014).

Of these ten occupational groups, the highest annual salary falls under the electrical power-line installers and repairers occupation at $92,435. The lowest annual salary is in the nonfarm animal caretaker occupation at $21,694 (City of Morro Bay 2014).

Table 5.13
San Luis Obispo-Paso Robles Metropolitan Statistical Area Projections of Employment (2014)

Occupation	Median Hourly Wage	Median Annual Salary	Estimated Employment		Percentage Change
			2010	2020	
Electrical Power-Line Installers and Repairers	$44.44	$92,435	190	300	58%
Home Health Aides	$10.49	$21,819	460	700	52%
Cost Estimators	$27.72	$57,657	180	270	50%
Market Research Analysts and Marketing Specialists	$26.44	$54,995	180	270	50%
Veterinary Technologists and Technicians	$14.63	$30,430	200	300	50%
Nonfarm Animal Caretakers	$10.43	$21,694	200	290	45%
Operating Engineers and Other Construction Equipment Operators	$33.80	$70,304	300	430	43%
Software Developers, Systems Software	$34.32	$71,385	120	170	42%
Insurance Sales Agents	$31.34	$65,187	170	240	41%
Construction Laborers	$23.90	$49,712	730	1,030	41%

Source: California Employment Development Department 2014

Note: Annual salary is calculated by multiplying hourly wages by 2,080.

Another way to consider the composition of the economic base in Morro Bay is to look at the distribution of business establishments by size. About 80 percent of establishments in Morro Bay have fewer than 10 employees, compared to 74 percent of establishments in the state overall. Only 1 percent of establishments in Morro Bay have 50 or more employees (Table 5.14). However, it is unclear whether the difference between Morro Bay and the state is statistically significant.

Table 5.14
Business Establishments by Size (2014)

	Morro Bay		California	
Employees	**Establishments**	**Distribution**	**Establishments**	**Distribution**
1 to 4	228	59%	499,482	56%
5 to 9	77	20%	158,081	18%
10 to 24	48	13%	108,909	12%
25 to 49	28	7%	76,835	9%
50 to 99	0	0%	26,569	3%
100 to 249	3	1%	14,229	2%
250 to 499	0	0%	3,439	0%
500 and higher	0	0%	2,102	0%
Total	384	100%	889,646	100%

Source: US Census Bureau, County Business Patterns, Zip Code 93442, 2014

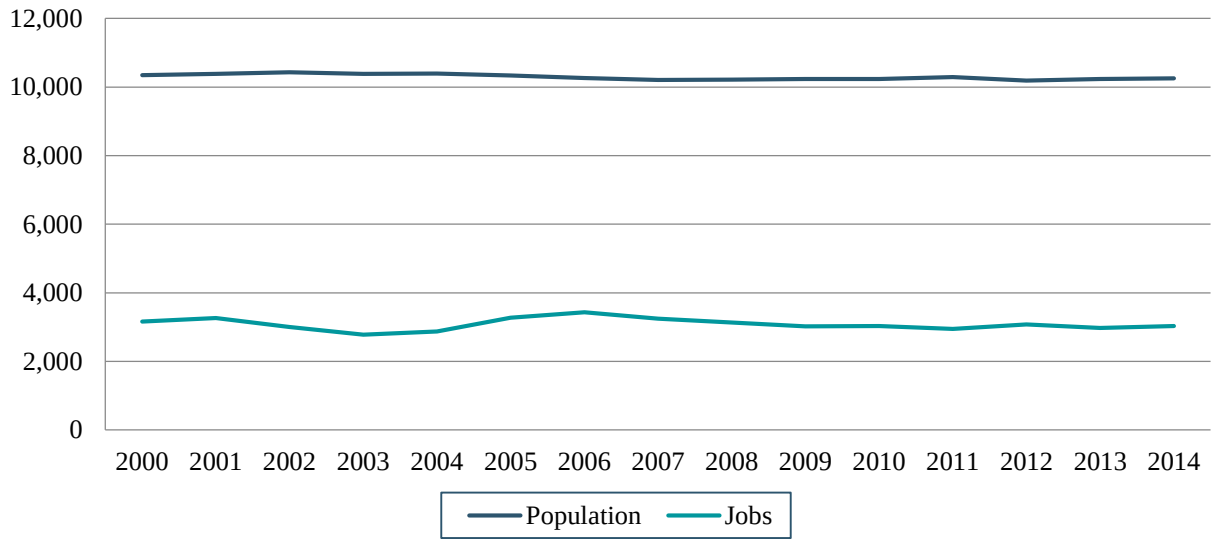
About one third of Morro Bay businesses are home businesses. 36 percent of Morro Bay businesses were home businesses in 2016 (City of Morro Bay 2016). The percent of home businesses statewide was 21 percent as of 2014 (US Census 2016), a substantially smaller percentage than Morro Bay.

An important measure of whether a community is successful at economic development is to compare population growth to job growth. Job growth can occur in two forms. Basic job growth increases the total number of export industry jobs. These basic jobs in turn support more non-basic or retail/service sector jobs in the local economy. Non-basic job growth can also occur in response to leakages to increase the range of goods and services offered in the local community. Morro Bay has a larger share of retail jobs than many communities because of its tourism industry, but the availability of resident-oriented services is limited due to the size of the community.

Any community where the economy is growing faster than the population, or where the economy is shrinking slower than the population, will have fiscal and economic sustainability (Lautman 2011). In Morro Bay, population growth has been flat since 2010. Some job growth occurred in the 2000 to 2006 period, but from 2006 forward, the job base in Morro Bay declined at an average of 2 percent per year. In 2014, which is the latest year of job data available, Morro Bay saw a 2 percent decrease in the number of jobs from 2013 levels, compared to virtually no change in population (Figure 5.7). Changes in job numbers from year to year are small enough that these changes may reflect random fluctuations in the economy rather than sustained trends, and

unemployment numbers for Morro Bay residents are the lowest they have been in recent years. However, it is unclear whether the types of jobs being provided in Morro Bay are consistent with community goals, or whether such jobs provide sufficient income to support employees living in the community.

Figure 5.7
Comparison of Population and Employment Growth (2000–2014)



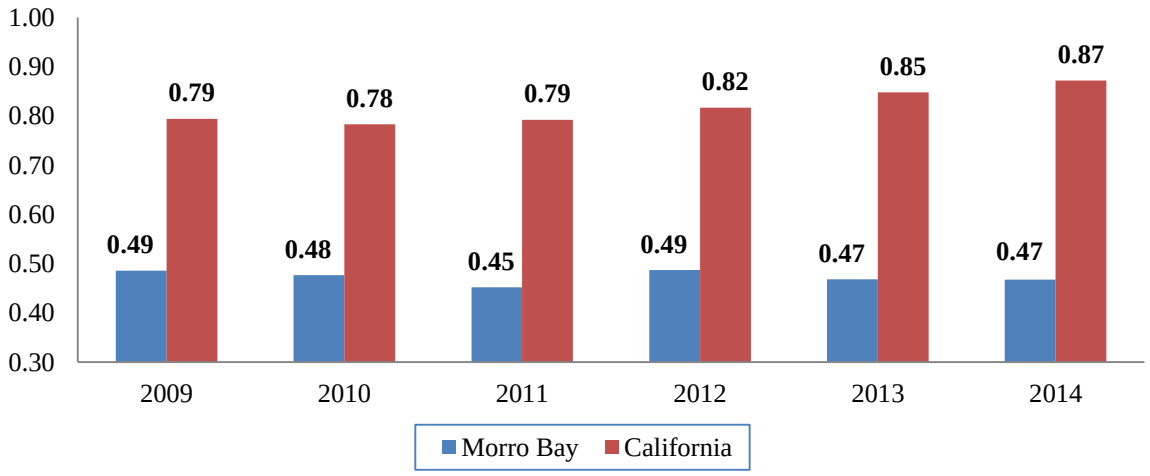
Source: US Census Bureau, County Business Patterns (jobs), 2009–2014; CA Department of Finance, Demographic Research Unit (population estimates), 2010–2014

Considering the types of job growth, it is possible to look at the number of basic jobs per household versus the number of non-basic jobs per household. Although a number of retiree households in Morro Bay do not require jobs, considering the jobs/housing balance over time for both basic and non-basic jobs yields an understanding of the nature of economic growth or decline. Basic jobs in this case include all sectors of the economy except retail, education, and personal services, which are considered non-basic.

The number of basic jobs per household in Morro Bay is significantly less than the rate for California as a whole (Figure 5.8). This is partly due to the retiree population, but also due to the lack of diversity in the local economy. In contrast, the number of non-basic jobs per household is much closer to the state average (Figure 5.9). In addition, there was little or no decline in the number of non-basic jobs per household at the local level (Figure 5.9). While this stability in non-basic (retail) jobs may be tied in part to the tourism

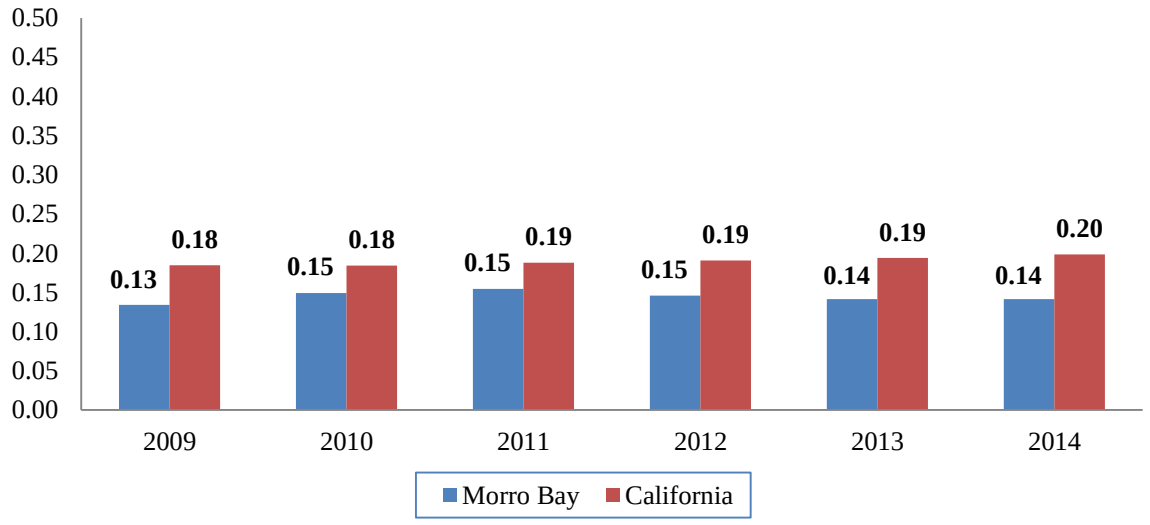
industry, these jobs tend to be lower paying and more cyclical. Creating basic or export industry jobs is crucial to sustaining the local economy over the longer term.

Figure 5.8
Basic Jobs per Household (2009–2014)



Source: US Census Bureau, County Business Patterns (jobs), 2009–2014; CA Department of Finance, Demographic Research Unit (households), 2010–2014.

Figure 5.9
Non-Basic Jobs per Household (2009–2014)



Source: US Census Bureau, County Business Patterns (jobs), 2009–2014; CA Department of Finance, Demographic Research Unit (households), 2010–2014.

Taxable sales are another key indicator of local economic conditions, particularly in an economy that relies heavily on tourism. Total taxable sales grew by 25 percent overall in Morro Bay between 2009 and 2014 (newest data available), although taxable sales grew by 32 percent statewide. During this same time period, San Luis Obispo County experienced an overall increase of 47 percent and outperformed the state in terms of percentage growth in taxable sales by retail sector in most categories.

Detailed data on collections by industry is not available at the city level, but from 2009 to 2014, Morro Bay experienced a decline in non-retail sales (Table 5.15). The share of non-retail sales in Morro Bay at 6 percent is significantly lower than the state, where non-retail sales accounted for 32 percent of the total in 2014. A larger reliance on non-retail sales tends to create greater stability in sales tax revenues.

Table 5.15 Taxable Sales ($1,000) (2009–2014)

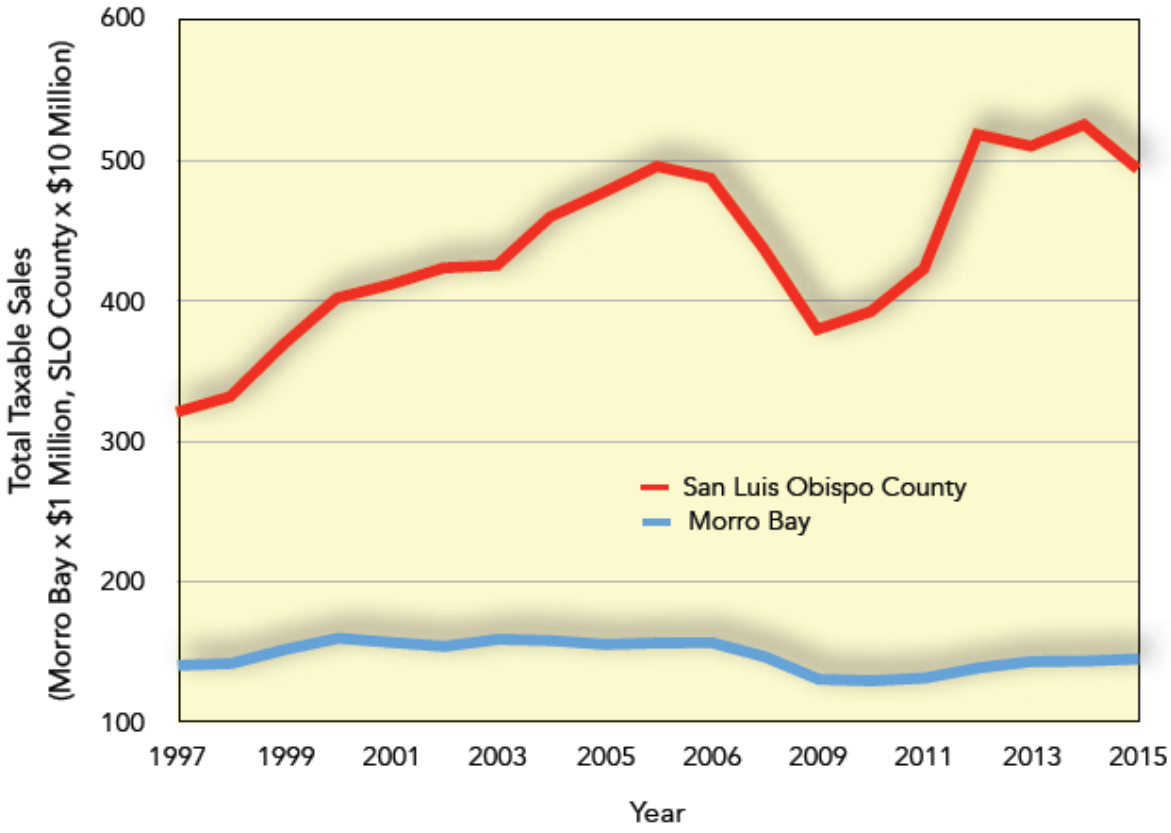
	Morro Bay			San Luis Obispo County			California		
	2009	2014 est.	Change	2009	2014 est.	Change	2009	2014 est.	Change
Retail and Food Services	$107.96	$139.39	29.11%	$2,495,350	$3,337,315	33.74%	$311,214,607	$410,766,421	31.99%
Motor Vehicles & Parts	N/A	N/A	N/A	$298,014	$530,385	77.97%	$44,488,199	$72,972,808	64.03%
Furniture & Home Furnishings	N/A	N/A	N/A	$58,543	$82,408	40.76%	$8,481,020	$11,053,779	7.39%
Electronics & Appliance Stores	N/A	N/A	N/A	$70,572	$67,328	-4.60%	$13,384,338	$14,373,859	31.16%
Building Materials & Supplies	N/A	N/A	N/A	$256,282	$340,240	32.76%	$23,978,313	$31,450,113	13.80%
Food & Beverage Stores	N/A	N/A	N/A	$219,833	$258,431	17.56%	$22,546,285	$25,657,919	22.27%
Health & Personal Care Stores	N/A	N/A	N/A	$74,401	$84,617	13.73%	$9,244,958	$11,303,451	48.94%
Gas Stations	N/A	N/A	N/A	$331,194	$518,000	56.40%	$39,077,835	$58,201,235	33.28%
Clothing & Accessory Stores	N/A	N/A	N/A	$178,574	$220,833	23.66%	$25,641,272	$34,175,725	0.73%
Sporting Good, Hobby, Book Stores	N/A	N/A	N/A	$94,647	$104,851	10.78%	$10,294,172	$10,369,749	6.24%
General Merchandise Stores	N/A	N/A	N/A	$320,635	$341,565	6.53%	$44,921,639	$47,724,256	12.32%
Misc. Store Retailers	N/A	N/A	N/A	$135,345	$158,001	16.74%	$16,385,169	$18,403,915	170.34%
Non-Store Retailers	N/A	N/A	N/A	$15,988	$52,959	231.24%	$2,849,864	$7,704,436	34.96%
Food Service and Drinking Places	N/A	N/A	N/A	$441,333	$577,696	30.90%	$49,921,542	$67,375,177	34.96%
All Other Outlets	$10,826	$9,301	-14.08%	$947,081	$1,728,707	82.53%	$145,278,340	$191,226,040	31.63%
Total All Outlets	$118,788	$148,688	25.17%	$3,442,432	$5,066,021	47.16%	$456,492,947	$601,992,461	31.87%
Percent Non-Retail Sales	9%	6%		28%	34%		32%	32%	

Source: California Board of Equalization 2009, 2014

Note: 2014 sales are estimated based on data for the first three quarters of that year.

When adjusted for inflation, Morro Bay's taxable sales have remained largely flat, despite significant growth in county-wide sales. Comparably, Morro Bay's share of county-wide sales has fallen by approximately one-third since 1997 (Figures 5.10 and 5.11).

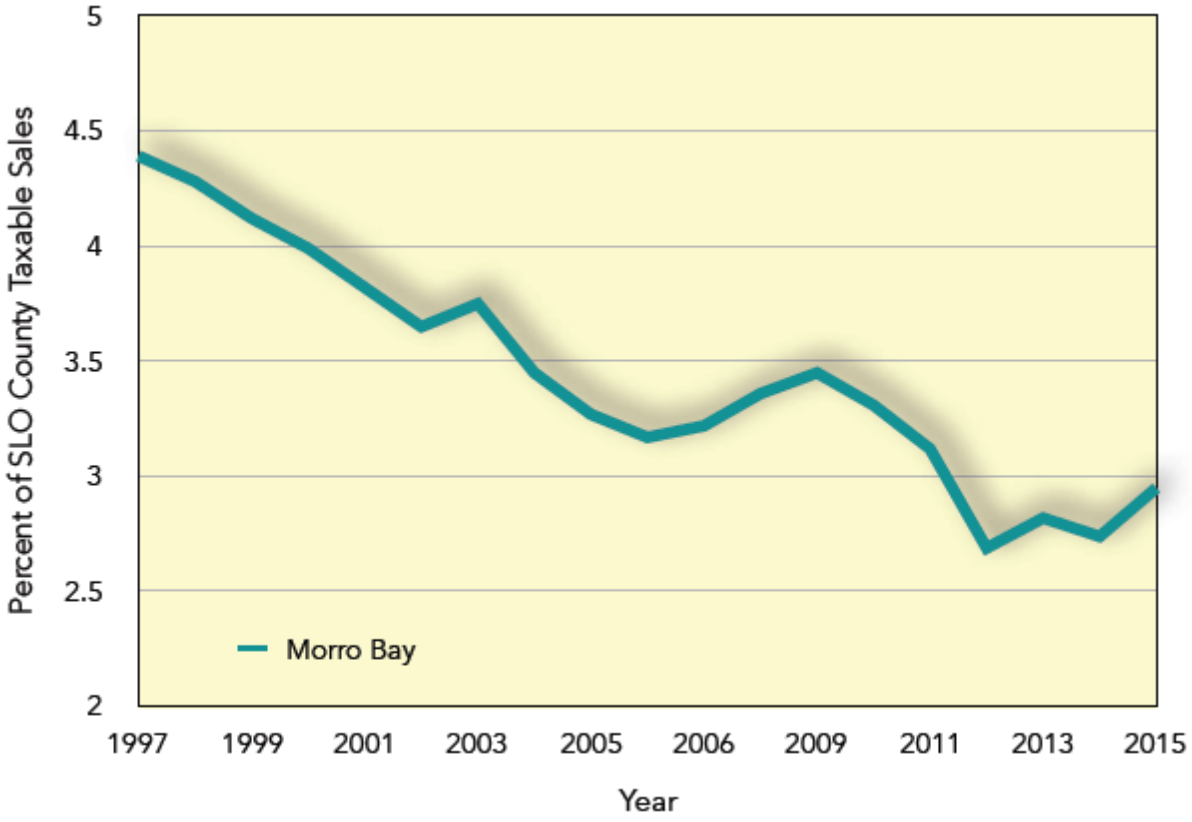
Figure 5.10
Morro Bay and San Luis Obispo County Taxable Sales, Adjusted for Inflation (1997–2015)



Adjusted for inflation to 2014 dollars using the CPI Inflation Calculator of the Bureau of Labor Statistics (https://data.bls.gov/cgi-bin/cpicalc)

Source: California State Board of Equalization

Figure 5.11
Taxable Sales in Morro Bay as a Percent of San Luis Obispo County Sales, Adjusted for Inflation (1997–2015)



Source: California State Board of Equalization

Construction activity is often a leading economic indicator. Residential construction activity in Morro Bay declined significantly from 2005 to 2012, similar to many communities in California. The total value of residential permits issued by the City fell from a high of $38.4 million in 2005 to a low of $7.8 million in 2009. Beginning in 2012, the activity level began to increase again to an annual construction value of $18.7 million in 2014.

The number of annual housing unit additions in Morro Bay actually peaked much earlier, from 1998 through 2001, with an average of 75 units added per year. While there is significant demand for additional housing in the region, there are other constraints to new development. However, the moderate increase in residential construction activity is a positive sign.

Quality of Life

Quality of life is a concern to businesses that need highly skilled labor, because it often impacts their ability to recruit workers from outside the local area. Ease of commuting directly impacts quality of life, both in terms of the time spent driving and the intensity of congestion. About 27 percent of the residents of Morro Bay commute more than 30 minutes to and from work each day, although the average commute is only 19 minutes, compared to a statewide average of 28 minutes. Only 38 percent of the residents work in the community, according to American Community Survey data, although a sizeable share of residents commutes only a short distance to San Luis Obispo.

Population turnover is another measure of the stability and character of a community. Although the recession has reduced mobility rates nationwide, healthy, growing communities tend to have a larger influx of in-migrants. About 17 percent of the residents in Morro Bay live in a different house than they did last year, compared to 14 percent of residents statewide. About 70 percent of those moved within San Luis Obispo County.

In terms of median home prices, prices for existing homes are about 12 percent higher in Morro Bay than the state as a whole, although given the coastal location and tightness of the regional housing market, this is not a sizeable price difference.

A sense of physical security affects both residents and businesses. The violent crime rate in Morro Bay is somewhat higher than the state average on a per capita basis, although property crimes are slightly lower (Table 5.16).

Table 5.16
Quality of Life Indicators (2014)

	Morro Bay	California
Average Commute Time (minutes)	18.8	27.6
Percent Commuting 30 or More Minutes Per Day	27%	40%
Population Turnover		
Same House One Year Ago	83%	86%
Different House One Year Ago	17%	14%
Same County	12%	10%
Same State	4%	2%
Out of State or Abroad	1%	1%
Median Existing Home Price	$548,440	$489,310
Crime Rates per 100,000 Population		
Violent	487	393
Property	2,282	3,459

Source: US Census Bureau 2014; California Dept. of Justice, 2014 Crime in California Report and CJSC Statistics Crimes and Clearances Database; California Association of Realtors 2015

Secondary Education

Having high quality local schools is essential to attracting and producing a quality work force. A comparative analysis of school quality includes class sizes (pupil-teacher ratio), graduation rates, spending per pupil, Scholastic Aptitude Test (SAT) scores, and college readiness.

The San Luis Coastal Unified School District (San Luis Coastal USD), which serves Morro Bay, has significantly higher graduation rates and a higher rate of graduates meeting University of California (UC)/California State University (CSU) requirements than the state as a whole. SAT scores are also higher. An estimated 59 percent of high school students from the San Luis Coastal USD meet the entrance requirements for state universities in California. Education spending per student in the San Luis Coastal USD is also higher at 118 percent of the state average (Table 5.17).

Table 5.17
Secondary Education (2013–2014 School Year)

	San Luis Coastal USD	California
Average Class Size (2014-15)	24.5	24.3
Education Expenditures per Student	$10,445	$8,867
Four Year Graduation Rate	96.80%	81%
% 9-12th Grade Students Taking the SAT	17.90%	15.20%
Average SAT Score	1,687	1,487
% Graduates Meeting UC/CSU Requirements	58.90%	41.90%

Source: California Department of Education 2016

Note: All data is for the 2013–14 school year unless noted.

California requires a high school exit exam for all students. At the 10th grade level, the percent of students that passed the exam in math and English ranged from 92 to 95 percent in the San Luis Coastal USD, compared to 83 to 85 percent at the state level, and 88 to 89 percent countywide. The San Luis Coastal USD has also been able to slightly increase the share of students that pass the exam over the past three years (Table 5.18).

Table 5.18
Secondary Education – Assessment

10th Grade CA High School Exit Exam	2011		2014	
	% Students Passing		% Students Passing	
	Math	English	Math	English
San Luis Coastal USD	93%	91%	95%	92%
San Luis Obispo County	88%	88%	89%	88%
California	83%	82%	85%	83%

Source: California Department of Education 2016

RETAIL MARKET ANALYSIS

The purpose of conducting a retail market analysis is to estimate the market demand for retail and service business categories and thereby identify potential new business opportunities and optimize land use distribution in the consideration of future development opportunities within the community. The information provided in this report can be useful to local entrepreneurs and to businesses preparing or updating business plans, product lines, and marketing.

Market analysis is a blend of art and science. No specific calculations will show with certainty the types of businesses, products, or services that will succeed in any given community. However, taking a comprehensive and realistic look at the market demographics, trends, and consumer behaviors may improve the likelihood of success. The following information provides a foundation for identifying retail business and future land use opportunities in Morro Bay.

Method

The first step in conducting a retail market study is to determine the trade area. The Morro Bay retail trade or market area encompasses approximately a 24-mile stretch from Cambria (north) to Los Osos (south) (Figure 5.12). This trade area estimation is based on conversations with City staff, a recent survey conducted by the Morro Bay Chamber of Commerce, local highways, and geography. The estimates of retail sales potential, average expenditures, consumer demographics, and purchasing behaviors are directly linked to this trade area.

Demand

In market analysis demand, spending potential is the amount of a product or service required to fulfill the needs of consumers in a trade area. This is driven by the size of the trade area, the number of consumers, their purchasing power, and behaviors.

Estimates for demand are based on historical data showing how much residents typically spend on different types of products and services in different types of stores. An average household expenditure for a type of merchandise is then applied to trade area demographics to obtain potential demand. The household expenditure figures in this report are customized to Morro Bay trade area households by The Nielsen Company, Nielsen Solution Center.[8]

[8] Nielsen derives demand data from the Consumer Expenditure Survey, which is conducted by the US Bureau of Labor Statistics. This survey aggregates data from two different surveys on the buying habits of American consumers, including data on expenditures, income, and household characteristics.

Supply

Supply is the amount of a product or service currently available in a trade area. This is organized by product category (e.g., grocery, home furnishings) and in this report is measured by retail sales. Supply estimates are derived from the US Census Bureau's Census of Retail Trade. The Census Bureau conducts an annual survey of year-end inventories, purchases, accounts receivable, and sales to estimate retail sales. Similar to preparing demand estimates, this data is applied to trade area demographics to obtain potential.

Retail Leakage and Surplus

Leakage occurs when demand exceeds supply. If retailers outside the market area are fulfilling the demand for retail products, sales are "leaking" out of the trade area. A sales leakage indicates that people living in the trade area are: (a) shopping outside of it, or (b) consuming less than expected given their income level.

Retail leakage does not mean that retail businesses are failing. A leakage means that total sales within a trade area are not as high as they could be based on the area population, demographics, and expected spending habits. This condition indicates an opportunity for new retailers to enter the trade area or for existing retailers to extend their marketing outreach.

Surplus occurs when supply of a product or service in the trade area exceeds demand. Sales surplus indicates that: (a) retailers are attracting shoppers that live outside the trade area, or (b) people living in the trade area consume more than is expected given their income level (Figure 5.13).

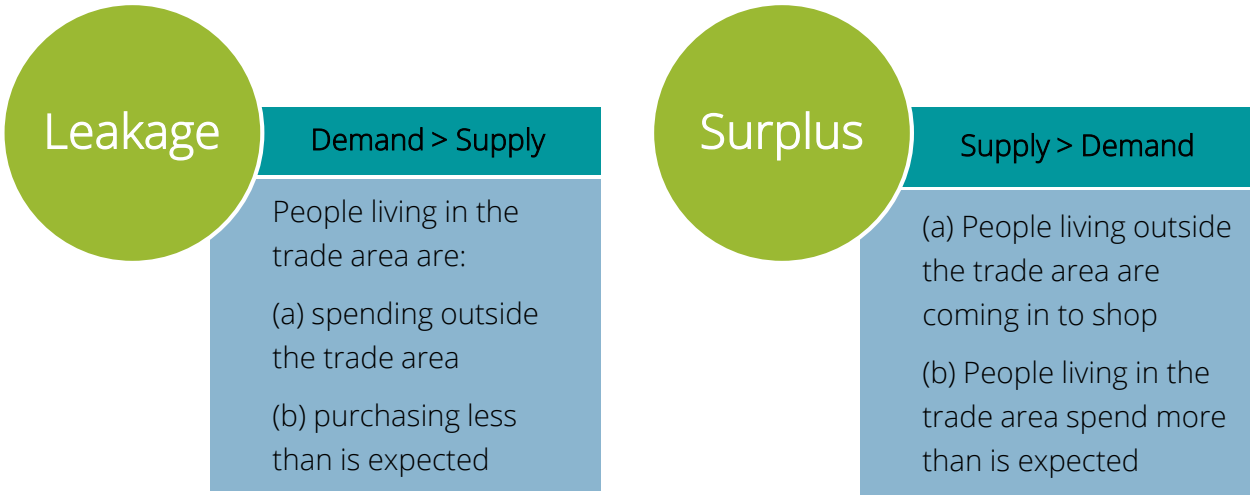


FIGURE 5.12

Morro Bay Retail Trade Area

Page 2

Figure 5.13
Trade Leakage and Surplus



Analysis

Twelve retail categories are usually considered when conducting a retail market analysis. The categories are based on the North American Industry Classification System.

- Apparel, Accessories—clothing, shoes, jewelry, leather goods
- Home Furnishings—furniture, mattresses, floor coverings, window treatments, kitchenware
- Electronics, Appliances—televisions, computers, cameras, stereos, household appliances
- Building, Home Improvement, Garden—building materials, paint, wallpaper, hardware, lumber, nursery, garden center
- Sporting Goods, Hobby, Book, Music—sporting goods, hobbies, toys, games, sewing, musical instruments and supplies, records/CDs, new and used books, newsstands
- Grocery, Supermarkets—grocery and supermarkets

- Convenience Stores—food marts primarily engaged in retailing a limited line of goods, snacks
- Specialty Food Stores—gourmet or organic foods, meat, fish, and seafood markets, fruit and vegetable markets, baked goods, candy, nuts, coffee and tea, spices
- Health, Personal Care—pharmacies, cosmetics, beauty supplies, optical goods, food supplement stores, medical supply stores, hearing aids
- Restaurants, Bars—full service and limited service restaurants (deli, pizza, takeout, fast food), cafeteria, buffets, contractors and caterers, mobile food services, drinking places (bars, lounges, nightclubs, taverns)
- General Merchandise Stores—department stores, discount department stores, warehouse clubs, dollar stores, variety stores
- Specialty Retail—art, florists, office supply, stationery, gifts, novelty and souvenir, used merchandise, pet and pet supplies, manufactured homes, hot tubs and pool supplies, tobacco, trophy and awards

Table 5.19 shows the existing distribution of potential sales and supportable retail space in the Morro Bay market area among the 12 retail categories. Retail leakage occurs in the following seven categories.

- Apparel, Accessories
- Home Furnishings
- Sporting Goods, Hobby, Books (no leakage in sewing, needlework, music stores)
- Convenience Stores
- Specialty Food Stores
- Restaurants, Bars (no leakage in full-service restaurants or bars)
- General Merchandise Stores

By applying Urban Land Institute's estimate of typical sales per square foot to the amount of retail leakage, an estimate of the area's supportable retail space can be calculated. The Morro Bay trade area data indicates a total of 552,489 additional square feet could be supported. However, to be practical, one must look beyond the data (Table 5.19).

Morro Bay's larger visitor population will drive many of the purchases (e.g., convenience stores, specialty food markets, and possibly sporting goods and hobby items). Also, given the proximity to the City of San Luis Obispo market, it is likely that some of the leakage will never be captured by the Morro Bay trade area (e.g., apparel, general merchandise, home furnishings). The Morro Bay Chamber of Commerce's 1995 and 2013 retail market studies confirm this. While the number of shopping trips to San Luis Obispo remained the same, some of the shopping in Morro Bay appears to have been replaced with online shopping.

Table 5.19
Morro Bay Trade Area Retail Market Analysis Supply and Demand (2016)

Merchandise or Service Category	Demand (Spending Est.)	Supply (Retail Sales)	Leakage (or Surplus)	Target Sales/SF[5]	Potential Supportable Space (SF)
Shopper Goods					
Apparel, Accessories [1]	$28,439,841	$7,208,698	$21,231,143	$209	101,584
Home Furnishings	$13,380,243	$3,422,432	$9,957,811	$140	71,127
Electronics, Appliances	$11,785,883	$12,499,243	($713,360)	$199	
Building, Home Imprv, Garden	$73,040,637	$109,786,470	($36,745,833)	$140	
Sporting Gds, Hobby, Book, Music	$10,871,608	$7,347,846	$3,523,762	$216	16,314
Food Stores					
Grocery, Supermarkets	$53,970,290	$72,729,347	($18,759,057)	$390	
Convenience Stores	$3,605,422	$473,374	$3,132,048	$390	8,031
Specialty Food Stores	$7,215,384	$1,458,071	$5,757,313	$390	14,762
Health, Personal Care [2]	$39,491,504	$41,405,240	($1,913,736)	$365	
Restaurants, Bars	$76,227,141	$74,099,854	$2,127,287	$263	8,089
General Merchandise Stores [3]	$76,057,579	$4,219,865	$71,837,714	$216	332,582
Specialty Retail [4]	$17,285,832	$50,361,872	($33,076,040)	$216	
Total Retail Leakage or (Surplus)			$26,359,052		
Estimated Supportable Retail Space					552,489

Source: The Nielsen Company 2016

[1] Apparel includes clothing, shoes, jewelry, and leather goods.

[2] Health and Personal Care refers to pharmacies, drug stores, cosmetics, beauty supplies, perfume stores, optical goods, health food and supplement stores.

[3] General Merchandise Stores include department stores, discount department stores, national chain department stores, warehouse clubs and superstores, and miscellaneous general merchandise stores.

[4] Specialty Retailers includes florists, office supplies, stationery, and gift stores.

[5] Target Sales are based on Urban Land Institute's estimate of typical sales per square foot, as presented in Dollars and Cents of Shopping Centers. This estimate is applied to the leakage to convert potential retail sales to estimates of supportable space (SF).

Another source of potential retail demand includes visitors to Morro Bay and San Luis Obispo County. According to reports, transient occupancy taxes (TOT) collected in Morro Bay increased 5.4 percent from 2011 to 2015 (see Figure 5.14). In contrast, TOT collected in the county increased by an average of 10.5 percent over the same period. Preliminary

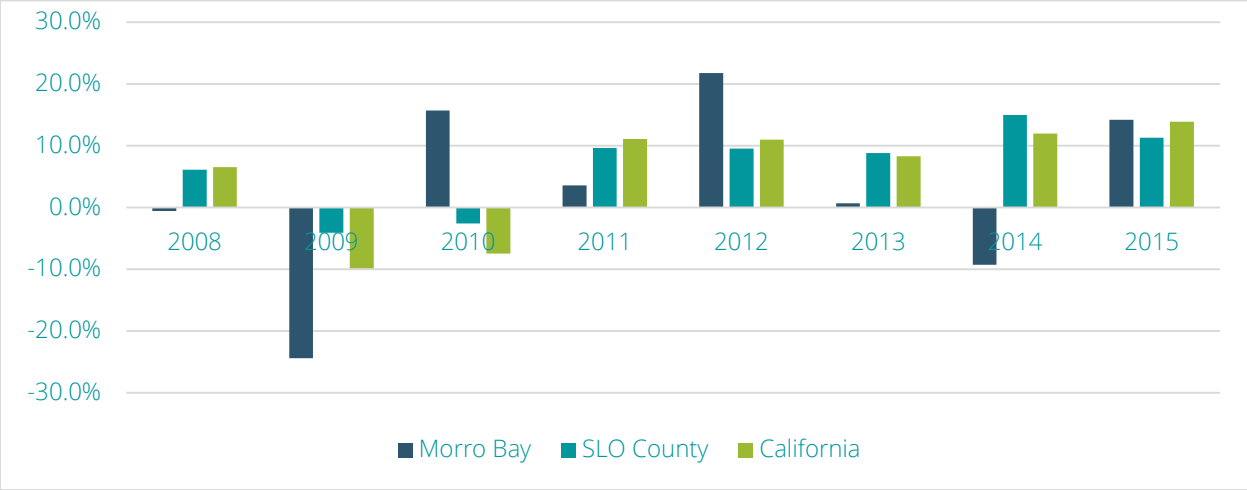
estimates for 2015 show Morro Bay and SLO collections at an all-time high ($2,902,400 and $36,387,000 respectively).

The travel industry is represented primarily by retail and service firms, including lodging and camping, restaurants and other food stores, retail, gasoline service stations, and other types of businesses that sell their products and services to travelers.

Visitors are attracted to areas that offer art and cultural events, an active downtown and night life, recreation, and entertainment events and venues. Visitor draws for Morro Bay include:

- Beaches, swimming, boating
- Wide variety of outdoor recreation, parks
- Museums, art galleries
- A variety of special events throughout the year including wine tastings, concerts, festivals, art exhibits, and competitions

Figure 5.14
Transient Occupancy Tax Collection Annual Growth (2008–2015)



Source: Dean Runyan Associates 2016

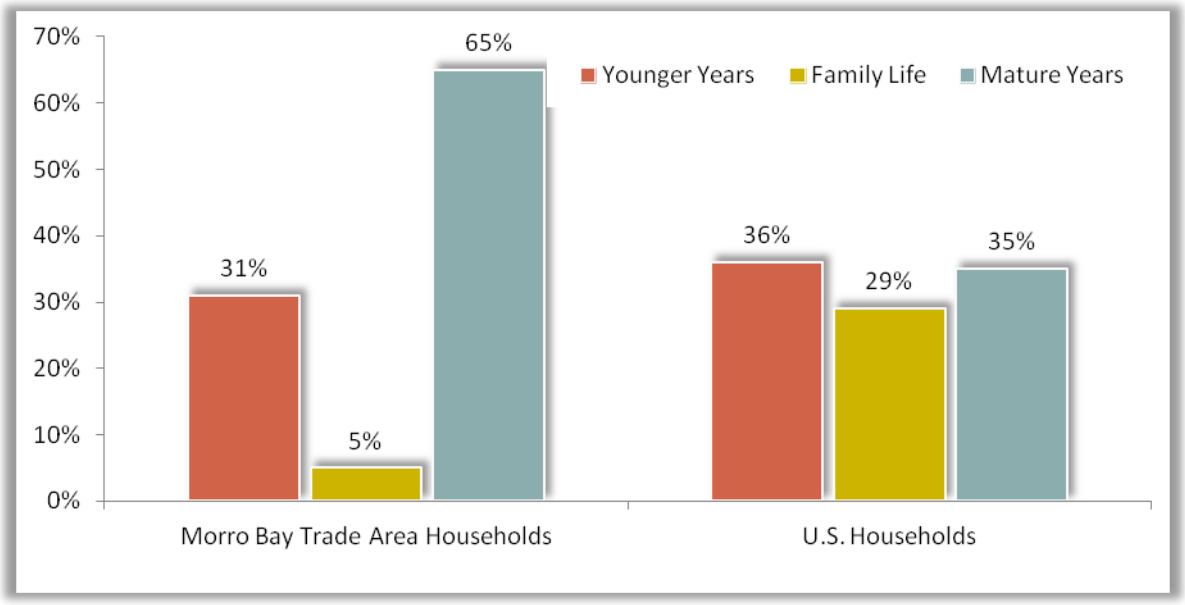
MORRO BAY TRADE AREA CONSUMER PROFILES

This final section of this chapter presents a socioeconomic profile of the Morro Bay retail trade area. People who share similar demographic characteristics may have divergent interests and shopping preferences. These representative profiles are prepared to give the City and local business owners an idea of the demographics and spending habits of households throughout the market area. They are intended to be used to better understand the consumers in the Morro Bay market area and judge the potential for a specific type of store or product line, which can help guide future economic growth and development in the community so as to satisfy the needs of local residents.

Nielsen Solution Center developed a system to categorize neighborhoods throughout the nation into 66 consumer segments. Neighborhoods are geographically defined by census blocks, which are analyzed and sorted by a variety of demographic and socioeconomic characteristics and other determinants of consumer behavior. The 14,966 households in the trade area are distributed into three life stage groups—younger years, family life, and mature years. Each group is further divided into 10 segments which are profiled.

The top consumer segments in the Morro Bay retail trade area are summarized in the graphs below. A strong majority of Morro Bay trade area households fall into the mature years category; about 70 percent of the trade area is in the baby boomer generation (9,700 households). These people are, for the most part, homeowners with incomes close to matching the median for the trade area ($57,790). Figure 5.15 and Tables 5.20 to 5.23 describe trade area market segment characteristics.

Figure 5.15
Distribution of Consumer Groups in the Morro Bay Trade Area and United States



(2016)

Table 5.20
Nielsen Consumer Segment – Younger Years (2016)

Segment	Young Achievers	Midlife Success	Striving Singles
% of Total HHs in Morro Bay Trade Area	12%	12%	7%
Age Range	45-64	30-40	20's
Children <18	No	No	No
Education	College Grads	High School	High School Grads
Employment	White Collar	Blue Collar	Service, Part Time, Student
Median Income	$53,000	$71,000	$35,000
Homeownership	Owners (new homes)	Mostly Owners (mid-priced)	Apartments
Lifestyle Interests and Spending Habits	Active, Progressive; biking, international vacations, skiing, backpacking, boating	Comfortable; boating, camping, biking, hunting, mountain biking	Fast-paced; sports, camping movies, music, fast food, water sports

Table 5.21
Nielsen Consumer Segment – Family Life (2016)

Segment	Mainstream Families	Young Accumulators	Accumulated Wealth
% of Total HHs in Morro Bay Trade Area	3%	1%	1%
Age Range	25-44	35-54	50+
Children <18	Yes	Yes	Mix
Education	High School (some college)	College	College
Employment	Blue Collar	Management	Professional, Executives
Median Income	$48,000	$72,000	$109,000
Homeownership	Own (modest or mobile)	Own (mid to large)	Own (large)
Lifestyle Interests and Spending Habits	Active; horses, sports, camping, hunt, fish, electronic toys, bulk groceries, 3+ cars	Upscale; outdoor sports, latest technology, camping, power boats, motorcycles	Upscale; electronic toys, top of the line sporting equipment, cars, vacations

Table 5.22
Nielsen Consumer Segment – Mature Years (2016)

Segment	Conservative Classics	Affluent Empty Nesters	Cautious Couples	Sustaining Seniors
% of Total HHs in Morro Bay Trade Area	28%	17%	13%	6%
Age Range	55+	55+	65+	65+
Children <18	No	No	No	No
Education	College	College	High School	High School
Employment	White Collar	Professional	Blue Collar or Retired	Retired
Median Income	$60,000	$89,000	$43,000	<$30,000 (fixed)
Homeownership	Own	Own	Own (modest)	Rent or Own
Lifestyle Interests and Spending Habits	Active; recent empty nesters nearing retirement, RV travel, shop in bulk	Active; country club, technology, travel, cultural events, community politics	Modest, rustic; hunting, fishing, boating, cooking, family restaurants	Sedentary and home-centered; gardening, sewing, woodworking

Table 5.23
Morro Bay Trade Area Demographics (2010–2021)

Generation	2010	2016	2021	Average Annual Growth (2016–2021)
Total Population Estimate	32,636	32,928	33,583	0.4%
Generation Z (Age 0-15)	4,220	4,266	4,238	(0.1%)
Next Generation (15-24)	3,358	3,109	2,757	(2.3%)
Millennials (25-34)	3,333	3,496	3,932	2.5%
Generation X (35-44)	3,252	3,313	3,438	0.8%
Baby Boomer (45-64)	10,903	9,644	12,217	5.3%
Retiring Baby Boomer (65+)	18,958	9,099	10,381	2.8%
Median Age	49.5	51.3	52.2	n/a
Male / Female	49% / 51%	48% / 52%	48% / 52%	n/a
Median Household Income	$42,249	$57,790	$61,410	1.3%
Single-Classification Race				
White	25,693	25,097	24,872	(0.2%)
Hispanic or Latino	4,826	5,391	5,962	2.1%
Asian	1,083	1,289	1,477	2.9%
Am.Indian / Alaska Native	148	175	205	3.4%
Black/African American	126	106	94	(2.3%)
Other	760	869	973	2.4%

Source: The Nielsen Company 2016

5.2 REGULATORY SETTING

LOCAL

Morro Bay City Council Goals and Objectives

The Morro Bay City Council adopted the 2016–2017 City Goals and Objectives on February 24, 2016. Goal number 6 (of 10) is to "Support Economic Development." This goal is supported by 13 actions (listed by letter, as identified in the goals document):

a) Tidelands Trust Lease Management Policy. Update and revise the City Lease Management Policy.

b) Economic Development Strategic Plan (EDSP). Launch the initial EDSP marketing toolkit and the 30-60-90-day action steps in the Morro Bay Economic Development Strategic Plan fostered by Chabin Concepts.

c) MBPP. Consider providing proactive support, including a possible "memorandum of cooperation", to any entity pursuing demolition, remediation and redevelopment {for non-energy producing purposes) of the Morro Bay Power Plant property.

d) Business Information on Website. Complete a full renovation of the "Doing Business" section of the City's website to enhance service for existing businesses and better market to potential new business for Morro Bay.

e) Business Incentives. Research, evaluate, and bring to Council for consideration business incentive opportunities that may encourage existing business reinvestments in Morro Bay or recruit new businesses to the community.

f) Commercial Real Estate Inventory. Partner with a local real estate agent to create a commercial real estate inventory and market this information on the City's website.

g) Aquarium Project. Work closely with the Central Coast Aquarium to bring a Concept Plan for approval to Council and the Coastal Commission.

h) Business Improvement Districts. Be receptive to, and provide City support, to any business improvement district opportunities proposed by Morro Bay business interests.

i) Economic Development Code Scrub. Complete a high-level analysis of the Morro Bay Municipal Code (MBMC) to revise/remove policies that impede or hamper an improved business climate.

j) Maritime Museum. Update the current Memorandum of Understanding and complete a license agreement with the Central Coast Maritime Museum.

k) Marine Services Facility. Contract for, complete, and bring to Council for consideration a full feasibility study for the proposed Marine Services Facility.

l) Tourism Integration. Complete the integration of the management of Tourism Business Improvement District operations with other aspects of the City's Economic Development plans and activities.

m) Food Trucks. Research and bring to Council for consideration a change to the MBMC to allow "food trucks" during approved events.

Local Economic Action Plan

The Local Economic Action Plan (LEAP) is a process started by the City in October 2014 to engage with residents and business owners to develop a short-term action plan for economic development. Most recently updated in August 2015, the LEAP includes the following initiatives:

1) Expedite processing for targeted businesses
2) Revitalize and link business districts to boost activity
3) Reinvent events to better serve residents, businesses, and visitors
4) Promote environmental assets of the area for residents and visitors to enjoy and to expand business and tourism results
5) Install a Pilot Parklet in business district to offer community spaces for residents and visitors to enjoy and to stimulate business activity
6) Assess fiber optic connectivity opportunities
7) Create an inventory of commercial properties and their features to expand and attract targeted businesses
8) Reassess business incubator and enhance local business building efforts
9) Outreach to attract businesses
10) Support for commercial and recreational marine interests

The findings from the LEAP process are included in the City's current efforts to develop an Economic Development Strategic Plan, which is expected to be completed in the first half of 2017.

5.3 PRIORITY FINDINGS

STAGNANT ECONOMIC INDICATORS

Since 2010, population growth has held relatively steady, while job growth has remained generally constant or decreased (the data is inconclusive). While this by itself is not necessarily worrisome, it is coupled with lower sales tax receipts than neighboring jurisdictions. This indicates a possibility that the local economy could face substantial structural challenges.

MARKET SURPLUS AND LEAKAGE

Based on an assessment of market surplus and leakage, the Morro Bay trade area data indicates a total of 552,489 additional square feet could be supported, although not all of the additional square footage would be needed or located in the City of Morro Bay. This assessment comes with the caveat that some of the identified sales leakage could be the result of online sales, which may be hard to compete with. While this is not meant to imply that an additional 500,000 or more of retail square footage should be located in or near Morro Bay, it does indicate that the community could support a number of new and varied retail stores.

MARKET SEGMENTS

A strong majority of Morro Bay trade area households fall into the mature years category; about 70 percent of the trade area is in the baby boomer generation (9,700 households). These people are, for the most part, homeowners with incomes close to matching the median for the trade area ($57,790). Future retail opportunities and other economic growth in Morro Bay should help meet the needs and buying habits of local market segments, including the baby boomers, although the city's economy should not cater exclusively to any particular type of resident or visitor.

6.0 Infrastructure and Public Services

Plan MORRO BAY

6.0 INFRASTRUCTURE AND PUBLIC SERVICES

This chapter identifies existing infrastructure and public services conditions in the planning area. Topics addressed include waste and recycling, water supply, wastewater facilities, storm drainage, energy, and telecommunications. This chapter also summarizes applicable regulations for infrastructure and service levels required for each type of infrastructure or service.

Topics relating to transportation infrastructure are described in Chapter 13.0 (Transportation and Mobility). Chapter 14.0 (Water and Water Quality) provides additional discussion of water quality conditions.

6.1 EXISTING CONDITIONS

WASTE AND RECYCLING

Solid Waste Provider and Facilities

The City contracts with a private franchise, Morro Bay Garbage, to provide residential and commercial waste collection services for the planning area. Morro Bay Garbage is a subsidiary of Waste Connections Incorporated, which serves the entire San Luis Obispo Integrated Waste Management Authority (IWMA) jurisdictional area. The IWMA includes San Luis Obispo County, the Cities of Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo, as well as numerous community service districts. The IWMA was formed in 1994 to plan and implement regional solid waste and hazardous waste programs to achieve state-mandated solid waste diversion goals. The current statewide goal is to divert 75 percent of solid waste from landfills through recycling, waste stream reduction, or composting by 2020.

Morro Bay Garbage provides collection service for household trash, recyclable materials, and clean green waste, such as untreated wood and cut grass. The estimated pounds of waste collected for Morro Bay between 2010 and 2014 ranged between 215,345 and 243,378 each year. There was no clear trend toward increasing or decreasing the

amount of waste collected during that time (CalRecycle 2015). Morro Bay previously had recycling centers where community members could drop off recyclable materials, including large volumes of materials or items that were not accepted in household collection bins; these facilities have since closed. The nearest recycling centers are in San Luis Obispo and Cambria.

Morro Bay Garbage deposits waste collected in Morro Bay at the Cold Canyon Landfill, one of three landfills in the IWMA jurisdictional area. Cold Canyon Landfill is located about 25 miles south of Morro Bay on State Route 227. Solid waste hauled to the landfill is either sorted and recycled, or deposited in the landfill. Cold Canyon also accepts scrap metal, glass, plastic, newspaper, cardboard, mixed paper, appliances, and yard waste directly and at various drop-off locations.

The estimated permitted landfill capacity of the Cold Canyon Landfill is just over 23 million cubic yards, as shown in Table 6.1. The landfill, recently expanded, is estimated to have 62 years of remaining life.

Table 6.1
Cold Canyon Landfill Estimated Site Life

Name of Facility	Total Estimated Permitted Capacity	Remaining Estimated Capacity	Estimated Remaining life
Cold Canyon Landfill	23,041,030 Cubic Yards	13,573,530 Cubic Yards	62 years

Source: Avenal and Cold Canyon Landfills 2016

The IWMA implemented the "SLO Take Back Program," which allows residents and businesses to dispose of materials that are not accepted in collection service bins, and instead drop off materials for free at designated sites. The SLO Take Back Program accepts fluorescent light tubes and compact fluorescent light bulbs (CFLs), motor oil and oil filters, and batteries. A related Home Generated Sharps Disposal Program issues residents a box for used needles, syringes, and other medically necessary sharp items. Residents can drop these boxes off at participating locations and receive a new empty box. Like the SLO Take Back Program, the Home Generated Sharps Disposal Program is free. Table 6.2 shows the locations in Morro Bay where participants can drop off materials.

Table 6.2
Participating Sites, SLO Take Back and Home Generated Sharps Disposal Programs

Name of Facility	Address	Accepted Materials
Albertson's	730 Quintana Road	Batteries, fluorescent tubes and bulbs
Arco AM/PM	940 Morro Bay Boulevard	Batteries
Auto Zone	450 Quintana Road	Motor oil and oil filters
Bottle Liquor	999 Main Street	Batteries
City of Morro Bay Wastewater Treatment Plant	160 Atascadero Road	Batteries, fluorescent tubes and bulbs, motor oil, and oil filters
Cookie Crock	490 Quintana Road	Batteries
Dollar Tree	710 Quintana Road	Batteries, fluorescent tubes and bulbs
Lighthouse Liquor	701 Morro Bay Boulevard	Batteries
Mobil	911 Morro Bay Boulevard	Batteries
Miner's Ace Hardware	510 Atascadero Road	Batteries, fluorescent tubes and bulbs
Morro Bay Drug & Gift	600 Morro Bay Boulevard	Medical sharps
Morro Bay Market & Spirits	395 Morro Bay Boulevard	Batteries
RadioShack/Coast Electronics	510 Quintana Road	Batteries
Rite Aid	740 Quintana Road	Medical sharps
Spencer Fresh Market	2650 Main Street	Batteries, fluorescent tubes and bulbs
Strictly PC	3118 Main Street	Batteries
Sunset Liquor	396 Atascadero Road	Batteries
Valero	900 Morro Bay Boulevard	Batteries

Source: San Luis Obispo Integrated Waste Management Authority 2016a, 2016b, 2016c, 2016d

The IWMA also provides hazardous waste service, by special request or if brought to a designated drop-off facility at the wastewater treatment plant, to small businesses that generate less than 27 gallons or 220 pounds of hazardous waste per month. Hazardous wastes are collected weekly on Saturdays, from 11 am to 3 pm. There are no hazardous waste treatment facilities in the area. Most hazardous wastes are transported to other states for incineration (Worrel 2016). Oil hazardous waste is processed at a facility in Morro Bay or is transported to the Los Angeles area. Two facilities in Morro Bay are designated "PaintCare" sites, where individuals can drop off paint for reuse, reprocessing, or safe disposal.

Disposal Rates

The California Department of Resources Recycling and Recovery (CalRecycle) reports per capita disposal rates, measured in pounds per person (both residential population and employed population) to establish compliance with Assembly Bill (AB) 939. Disposal rates are reported for the San Luis Obispo IWMA, and are not separated by jurisdiction. Between 2010 and 2014, per capita disposal rates for the IWMA ranged between 4.3 and 4.9 pounds, and disposal rates per employee ranged between 11.5 and 13.8 pounds, as shown in Table 6.3. Both trends are below established state targets for jurisdictions. It likely that Morro Bay's per capita disposal rates do not differ dramatically from that of the IWMA as a whole.

Table 6.3
IWMA Per Capita Disposal Rates (2010–2014)

Year	Disposal (tons)	Population	Residents Disposal (lbs./person/day)	Employment	Employees Disposal (lbs./person/day)
2010	226,987	269,333	4.6	89,968	13.8
2011	228,975	270,966	4.6	99,642	12.6
2012	215,345	271,483	4.3	102,420	11.5
2013	234,918	272,177	4.7	105,591	12.2
2014	243,378	272,357	4.9	108,904	12.2

Source: CalRecycle 2015

WATER SUPPLY

Service Area and Service Provision

The Morro Bay Public Works Water Division provides water service to the city. The city's water service area is bounded by the City of Morro Bay's sphere of influence (SOI), which includes the City limits and a small area north of the city, west of State Route 1 (see Figure 1.3 for reference). In 2010, the service population was 10,608 people. The most recent Urban Water Management Plan (UWMP), which provides estimates for demand and water supply for a period of 25 years into the future, was prepared in 2010. The UWMP projects the service area population to reach 12,255 by 2035 (City of Morro Bay 2010). Public Works staff has collected additional water supply information from 2015 (provided in discussions below) in anticipation of preparing a One Water Plan for the city.

Water Supply and Demand

Sources

The city derives its water supply mostly from the State Water Project (SWP), purchased through San Luis Obispo County, and local groundwater. A desalination plant supplements the city's water supply in drought conditions (City of Morro Bay 2010). In 2015, total water production available to the City was 1,088 acre feet (City of Morro Bay 2016b).

Surface Water

The city's existing water supplies are provided almost entirely (about 97 percent) by the SWP. The City is contractually entitled to 1,313 acre-feet per year of state water from the County of San Luis Obispo, plus an additional 174 percent drought buffer to ensure reliability when the SWP has to reduce overall deliveries during dry years (City of Morro Bay 2010).

Groundwater

The City has access to, and water rights permits for, two local groundwater basins: the Morro and Chorro Basins. The Chorro Creek water rights include a condition that the City can only pump its wells when Chorro Creek flow exceeds 1.4 cubic feet per second (cfs), which can limit the availability of the resource for use as a water supply. In total, the City has pumping rights to 1,723.5 acre-feet per year from both basins; up to 1.2 cfs and 581 acre-feet per year from Morro Basin, and up to 3.171 cfs for Chorro Creek underflow. The City has historically operated seven drinking water wells, four of them active, in the Morro Groundwater Basin, and eight wells in the Chorro Groundwater Basin, only one of them active due to high nitrate levels in the others. The Chorro Basin water has not been used since 2012 for these reasons. It is sampled annually to establish water quality (City of Morro Bay 2016b).

Desalination

In 1992, the City constructed a seawater desalination plant during a drought emergency. The plant utilizes a sweater reverse osmosis (SWRO) system to desalinate seawater produced from five seawater wells located along the Morro Bay harbor.

In 1995, the California Coastal Commission approved Morro Bay LCP Amendment LCP 1-94 allowing the desalination plant to operate "as needed to ensure that the City's minimum water quality standards are met, as routine replacement, and to offset drought conditions." However, after completion, the plant operated for several months and was shut down due to excessive operating costs and after increasing iron concentrations in the raw water caused rapid fouling of the desalination plant's pretreatment system. As a result, between 1995 and 2002, the desalination plant was not operated. Limited pilot testing was conducted during June/July 2001 to evaluate potential methods to minimize the impact of the raw water's high iron concentrations.

Currently, the desalination plant is operated to offset seasonal peaking and for routine supply replacement, such as SWP outages. In the future, the desalination plant may be utilized more regularly once the iron fouling issues have been resolved. The City's permits for outfall and sea well operation have expired; however, City staff has discussed with the Coastal Commission the possibility for operating the facility under certain emergency conditions. The Public Works Department is currently working on obtaining the appropriate permits.

Projected Demand

In 2010, there were 5,384 active water accounts in the Morro Bay SOI. The City delivered a total of 1,255 acre feet to these accounts. The plurality of accounts, 764, were supporting residential units. The remainder were commercial, governmental, and landscape accounts. Morro Bay has a large tourist influx, as well as numerous housing units that are only used seasonally. Consequently, average annual occupancy rates for dwellings with active water accounts for most of the year are around 80 percent.

Water demand in Morro Bay has gradually increased as population increased in the latter half of the twentieth century. However, as a result of water conservation measures taken by the City, per capita water use has dropped considerably over time. Per capita water use dropped from over 140 gallons per capita per day (gpcd) before 1990 to under 106 gpcd in 2010 (City of Morro Bay 2010). One of the reasons that Morro Bay has such low per capita water consumption is that many of the water conservation measures implemented during the ongoing drought, such as plumbing retrofits and prohibitions against wasting irrigation water, continue to benefit the community.

Water demand is expected to continue increasing slowly through 2035, with a projected 1,452 acre-feet delivered per year by that time (City of Morro Bay 2010).

Projected Supply

The City's water supply is projected to remain relatively constant from 2015 to 2035 to meet associated projected water demands, with the majority of this demand being met by imported surface water, and the remaining supplies serving as a backup for reliability. The City is expected to have an available supply in excess of projected demands through 2035. Details describing imported water, native groundwater, and desalination facility supplies are presented in the following section. Table 6.4 details water supply by source as of 2010.

Table 6.4
Morro Bay Water Supply (2010, 2015)

Water Supply Source	Acre Feet/Year 2010	Percent	Acre Feet/Year 2015	Percent
Purchased from County (SWP)	873	69%	950	87%
Groundwater	128	10%	0	5%
Recycled Water	0	0%	0	0%
Desalination Water	258	20%	138	13%
Total	1,259	100%	1,088	100%

Source: Morro Bay 2010, 2016b

In the case of a multiple-dry year drought, the City would expect to see a reduced supply from the SWP and groundwater sources, and a consistent supply of desalinated water. However, the City also has entitlement to an additional drought buffer of 174 percent from the SWP, which allows the City to receive deliveries up to its full allocation of 1,313 acre-feet per year when SWP water deliveries are reduced due to drought conditions. If the anticipated reduced water imports from local and regional agencies occur, the City will be able to fully support demand. The anticipated reliability of supply, as calculated in the 2010 UWMP, is shown in Table 6.5.

Table 6.5
Morro Bay Projected Water Supply under Dry-Year Conditions

Source	Normal (avg) Water Year	Single-Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Imported Water from SWP w/Drought Buffer	1,313	144	1,223	1,223	1,223	1,223
Morro Groundwater	581	581	581	581	581	581
Chorro Groundwater	1,143	566	566	566	566	566
Desalination Facility	645	645	645	645	645	645
Total	3,682	1,936	3,015	3,015	3,015	3,015
Percent of Normal		53%	82%	82%	82%	82%

Source: Morro Bay 2011

However, conditions in local and distant areas affecting the groundwater and SWP supply can impact the reliability of supplies. For instance, water from the SWP is vulnerable to drought. In significant drought years, water deliveries from the SWP may be substantially curtailed from normal levels. The most severe drought known to have occurred in Morro Bay began in 2012 and has persisted into early 2016. The drought, which is part of a historic statewide drought, has had significant impacts on SWP water supplies.

Over the last decade, the City of Morro Bay had difficulty meeting water demand, in part because the capabilities of its groundwater sources, the Chorro and Morro wells, were degraded as the result of water quality concerns and in-stream minimum flow requirements. The City was able to meet demands during a high drought period through agreements with the Central Coast Water Authority for additional SWP supply. The City has also, at times, supplemented water supplies with water pumped from the Chorro Basin, and on several occasion used emergency exchange water from the California Department of Corrections and Rehabilitation (CDCR) California Men's Colony water treatment plant.

Water Infrastructure

The City had historically had high water losses resulting from pipeline leakage and unaccounted-for use. Consequently, the City has initiated an extensive pipeline replacement program to reduce pipeline losses.

Significant capital improvements are needed within the next five years to address existing system deficiencies. Projects include new groundwater wells, water storage tanks and pipeline improvements to improve reliability and fire flow, desalination plant rehabilitation and upgrades, and conversion to automatic meter reading.

The City is considering construction of new groundwater wells in two areas: as many as four additional wells in the Romero Well Field area, and as many as six additional domestic water wells in the Ashurst Well Field Area (Morro Bay 2012a, 2012b). Both areas are within the Chorro Valley Groundwater Basin. In 2015, the City put out a bid for development of an Integrated Fixed-Network Advanced Metering Infrastructure with Meter Data Management. The project includes installation of 534 new water meter registers throughout the city. In the long term, funding will be needed to rehabilitate and replace old, substandard pipelines. The City anticipates seeking low-rate subsidized financing to help fund high-priority near-term needs. The adopted 2016–2017 budget for water services is approximately $5.14 million dollars, which is funded almost exclusively by water sales and service fees (City of Morro Bay 2016c).

WASTEWATER FACILITIES

The City of Morro Bay Public Works Department provides wastewater collection services within the SOI. The City co-operates its sewer system and wastewater treatment plant through a Joint Powers Authority (JPA) with the Cayucos Sanitary District. The JPA sets forth the respective rights of Morro Bay and Cayucos for purposes of ownership and capacity rights to the plant, related facilities, collection system, and operation and maintenance of the wastewater treatment plant.

The district's wastewater system encompasses five lift (pump) stations and approximately 23.1 miles of gravity collection sewer lines. Wastewater is conveyed through a main line to the Morro Bay-Cayucos Wastewater Treatment Plant (also known as the Morro Bay Cayucos Sanitary District, or MBCSD) located on Atascadero Road in

Morro Bay. The MBCSD currently serves a population of approximately 13,300 people, and has an average daily flow of 1.089 million gallons per day (City of Morro Bay 2016).

The MBCSD is aging and no longer has adequate capacity, resulting in primary-treated only sewage being discharged directly into the ocean at the rate of roughly a million gallons a day. The City of Morro Bay has been considering the reconstruction and expansion of the wastewater treatment plant for a number of years.[1] Under a ruling by the California Coastal Commission, the MBCSD plant cannot be replaced on its existing site. Discussions are ongoing about the location, type, financial structuring, and ownership of the replacement plant. The City has convened the Water Reclamation Facility Citizen Advisory Committee to represent the community and provide recommendations based on review and feedback. The committee was formed at the direction of the City Council in early 2014.

The replacement of the MBCSD wastewater plant is part of a larger set of ongoing projects identified in the Sewer System Management Plan. Other infrastructure improvement projects include ongoing storm drain improvements, primarily funded by Measure Q funds, and ongoing maintenance and repair of sewer pipelines and lift pumps. Morro Bay's adopted 2016–2017 budget allocates approximately $5.61 million dollars, funded almost entirely by sewage use fees (City of Morro Bay 2016c).

STORM DRAINAGE

City engineering staff are responsible for restoration, protection, and preservation of surface waters and water quality in the City of Morro Bay as well as maintenance, repair, mapping, and evaluation of drainage systems within the public domain, including all street rights-of-way. The City of Morro Bay's Storm Drainage Master Plan (SDMP), adopted in 1987, provides the most recent comprehensive look at storm drainage and flood control collection. The City has recently undertaken an effort to update the plan, which will incorporate updated capital project needs, address major maintenance of the existing storm drain system, and address water quality and low-impact development.

[1] The Cayucos Sanitary District had originally been involved in the reconstruction and expansion plans, but elected to withdraw from the process and construct its own separate wastewater treatment plant.

Currently, staff reviews development applications to ensure they provide on-site storm drainage designs which are environmentally conscious, enhance water quality, and preserve and protect coastal waters and resources. All development and redevelopment projects which create or replace more than 2,500 square feet of impervious area must incorporate stormwater management controls as described in the Stormwater Management Guidance Manual for Low Impact Development and Post-Construction Requirements. The manual is a supplement to the City of Morro Bay Department of Public Works Standard Drawings and Specifications of the City's Municipal Code.

Additional discussion of storm drainage in relation to water quality is located in Chapter 14.0 (Water and Water Quality).

ENERGY

Electricity

Pacific Gas and Electric (PG&E) supplies electricity to customers in Morro Bay. PG&E is an investor-owned utility that provides electricity to most of the northern two-thirds of California.

In 2015, PG&E provided 45,487,838 kilowatt-hours of electricity service to customers in Morro Bay. Of that supply, 46 percent was for residential use, 49 percent for commercial use, 0 percent for industrial use, and 5 percent for municipal use. Use by rate class is described in Table 6.6.

Table 6.6
Morro Bay Electricity Consumption by Rate Class (2005–2015)

Rate Class Description	2005 kWh	2015 kWh	Change 2005-2015	Percent Change 2005-2015
Residential	24,063,944	23,611,140	-452,804	-2%
Commercial	2,360,372	2391113	-5,996,840	-24%
Municipal	2,363,279	2,396,002	32,723	1%

Source: PG&E 2016

Overall electricity use has decreased since 2005, the base year for the Climate Action Plan analyses. Overall, per capita electricity use has declined from 51,904,759 kWh in

2005 to 45,487,838 in 2015. The drop is primarily due to reduced use in the commercial sector. Per capita residential use has increased since 2005—up from 242 kWh per capita in 2005 to 339 per capita in 2015.

Power Plant and Substation Facilities

A power plant once used by PG&E for electricity production was decommissioned in 2014. Close to $800,000 in revenues for the City from the plant were lost with its decommissioning. The power plant, located directly north of the Morro Bay Rock, occupies a prominent visual place on the Morro Bay coast. Dynegy, a Houston-based company, owns a large portion of the retired Morro Bay Power Plant property. The PG&E substation behind the Dynegy property is accessed from the sea via existing subterranean channels and is still operational. Dynegy has leased portions of the property; private interests, as well as state and local officials, are considering a range of new projects that would redevelop the property.

Natural Gas

In Morro Bay, natural gas is provided by Southern California Gas Company (SoCalGas), which is owned by Sempra Energy. Sempra Energy also owns San Diego Gas & Electric (SDG&E). The SoCalGas territory covers approximately 20,000 square miles from San Luis Obispo and Visalia in the north to the Mexican border, with the exception of San Diego County. Natural gas services are provided to residential, commercial, industrial, utility electric generation companies, and wholesale customers. Table 6.7 shows natural gas consumption in Morro Bay broken down by sector; there are no industrial customers in the city. In 2015, natural gas use was 2,443,163 therms across all sectors.

Table 6.7
Morro Bay Natural Gas Consumption (2015)

Sector	# of Customers	Natural Gas Use (Therms)	Percent of Total
Commercial	335	833,841	34%
Single-Family Residential	4,572	1,288,524	53%
Multi-Family Residential	1199	320,798	13%
Total Therms		2,443,163	100%

Source: SoCalGas 2016

TELECOMMUNICATIONS

The two primary telecommunication providers in Morro Bay are AT&T and Charter Communications. Both companies offer landline telephone, wired Internet, and television services. According to the US Census, telephone service is available in approximately 98.5 percent of Morro Bay households (US Census Bureau 2014). The Census does not have information about the availability of other telecommunication services in Morro Bay.

Morro Bay is a key node in the global telecommunications network. Two underwater cables connect to land at Morro Bay. One cable, the Japan-US Cable, runs offshore in a loop between Morro Bay, Manchester (100 miles north of San Francisco), three locations in Japan, the island of O'ahu in Hawaii, and then back to Morro Bay. Morro Bay is also an end point in the Southern Cross Cable Network, which runs from Morro Bay to the Big Island of Hawaii, New Zealand, Australia, Fiji, O'ahu, and ends at Hillsboro, Oregon (TeleGeography 2016). These underwater cables connect to data cables on land, which run to Los Angeles, the San Francisco Bay Area, and the Central Valley (Durairajan et al 2015).

FIRE PROTECTION

The Morro Bay Fire Department provides fire protection, first response emergency medical services, ocean fire and rescue, and technical rescue services in the planning area. The department also undertakes hazardous material operations along with other services such as training activities, fire prevention and code enforcement, public education and assistance, disaster preparedness, and management of the City's Emergency Operations Center.

Stations, Equipment, and Staffing

The City currently employs a fire chief, 10 career fire suppression personnel, a half-time administrative technician, a part-time fire marshal, and up to 20 part-time reserve firefighters. Fire personnel operate from one staffed fire station (Fire Station 53/Headquarters) located at 715 Harbor Street and one non-staffed fire station (Fire Station 54) located at 460 Bonita Street. Ambulance transport services are provided by

San Luis Ambulance, a private paramedic ambulance provider, which has one ambulance located in Morro Bay.

The Fire Department, like other City departments, does not have an equipment replacement plan for major equipment. However, Fire Department staff members have used community donations, in-kind donations, and grants to maintain a modern fleet. The City is in the process of establishing a capital replacement fund for equipment. The adopted 2016–2017 budget for the Morro Bay Fire Department was $2.33 million (City of Morro Bay 2016c).

Aid Agreements

The Fire Department has mutual and automatic aid agreements with neighboring communities. These reciprocal agreements give fire departments authority to rapidly deploy resources to areas outside jurisdictional boundaries when the need arises. Firefighter/paramedics also respond cooperatively with the Morro Bay Harbor Patrol and US Coast Guard to provide emergency services for incidents occurring offshore.

The City shares use of the San Luis Obispo Emergency Command Center operated by a central County office, which dispatches for seven other fire departments.

Medical Service

Regional communications and dispatch services are provided directly by the City Fire Department. Of the 1,908 incidents resulting in Fire Department responses in 2014, the most recent reporting year, the majority were medical related. Common medical-related calls include incidents for critical patients requiring advanced life support, medical aid requiring basic life support, and vehicle accidents.

Response Time and Insurance Rating

The Fire Department has divided the city into nine response zones or districts and averaged its response time to each zone. The department uses three additional zones (10, 11, and 12) to identify automatic or mutual aid calls outside the city limits. The department's goal is to maintain an average response time of 5 minutes 90 percent of the time. Response time incorporates the sum of dispatch time, firefighter reflex time, and driving time (City of Morro Bay 2009).

The Insurance Service Office (ISO), a national rating service sponsored by fire insurance carriers to measure firefighting capability to reduce structural fire losses, provides rankings of firefighting capability, including response time, on a scale of 1-10, with 1 being best level of service and 10 being no service at all. The ISO assigned the City of Morro Bay a Class 4 rating as of 2013.

2014 was the busiest year for the Fire Department to date, with 1,908 incidents. The department experienced a 3.6 percent increase over the previous year's incidents, with a 10-year average of 2 percent increase annually (City of Morro Bay 2015a). The Fire Department has limited capacity to respond to increasing demands.

POLICE PROTECTION

The Morro Bay Police Department (MBPD) provides police protection services to preserve peace and prevent crime and disorder by enforcing state laws and city ordinances within the planning area. The MBPD has two divisions:

- The Operations Division includes code enforcement, equipment/fleet management, investigations, patrol operations, special operations, and training programs.
- The Support Services Division includes business and support operations, public safety communications, police finances, police records, and property and evidence.

MBPD officers undertake a variety of roles, including patrol, school resource officer, detectives, Explorer advisor, regional SWAT team operator, bicycle patrol, and drug recognition evaluator. The MBPD also runs or participates in a variety of community-based programs, including a police volunteer program, a police Explorer program, and an active neighborhood watch program.

Stations and Staffing

Current MBPD staffing includes a police chief, a commander, a support services coordinator, four sergeants, two corporals, nine officers (including two senior officers), one part-time officer, and one part-time evidence/property technician. This staffing reflects a reduction since 2010 due to budget constraints. The adopted 2016–2017

budget for the MBPD was $3.15 million, plus an additional $233,000 for police support services (City of Morro Bay 2016c).

The MBPD headquarters are located in the old Fox Building located at 850 Morro Bay Boulevard.

Aid Agreements

The City has mutual aid agreements with neighboring communities, including Los Osos, Cayucos, Cambria, and San Luis Obispo County. As of mid-2014, the MBPD conducts dispatching with the San Luis Obispo Sheriff's Office as the result of an agreement for both fire and police dispatching. The regionalized dispatching is intended to provide enhanced coordination for multiple jurisdictional responses during emergencies, improved organizational efficiency using multiple dispatchers, and increased access for the community.

Types of Calls

In 2014, the most recent reporting year, the MBPD had 12,959 individual items to respond to, including calls for service and actions initiated by police officers. Based on more detailed data available from previous years, most calls for service were information-only calls or to report items that had already happened. Officers made 471 arrests, issued 813 citations, and responded to 146 traffic collisions. The most commonly reported offenses in Morro Bay in 2014 were public drunkenness (116 reports), outstanding warrant charges (73 reports), larceny (72 reports), and narcotic offenses (60). Morro Bay had no reported homicide or arson cases in 2014 (Morro Bay Police Department 2015).

SCHOOLS

The San Luis Coastal Unified School District (San Luis Coastal USD) provides elementary school (K-12) public education to students living in Morro Bay. The system includes 10 elementary schools, 2 middle schools, 2 comprehensive high schools, and 1 continuation high school. Two of these schools are located in the planning area: Del Mar Elementary and Morro Bay High School. Table 6.8 identifies these schools and their enrollments for the 2014–2015 school year. Table 6.9 shows enrollment trends for the

two schools in Morro Bay. Middle-school aged children (grades 6-8) attend Los Osos Middle School, which is in the unincorporated town of Los Osos, to the south of Morro Bay.

Table 6.8
San Luis Coastal Unified Schools Enrollment (2014–2015)

School	Grades	Enrollment	Classrooms	Staff (Teachers)	Average Class Size
Del Mar Elementary	TK-5	443	27	52 (30)	24
Morro Bay High	9-12	867	60	84 (49)	24

Source: California Department of Education 2016

Table 6.9
San Luis Coastal Unified Schools Enrollment Trends

School	Annual Student Enrollment						Percent change, 2009-2010 to 2014-2015
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	
Del Mar Elementary	448	438	463	484	456	443	-1.1%
Morro Bay High	857	849	845	852	825	867	1.2%

Source: California Department of Education 2016

The planning area is located just west of the post-secondary learning institutions of California Polytechnic State University, San Luis Obispo (Cal Poly), located adjacent to San Luis Obispo; and Cuesta Community College, located along Highway 1 between Morro Bay and San Luis Obispo.

Quality and Capacity

In 2014-15, per pupil spending at Del Mar Elementary was $10,096 for basic teaching expenses, which is slightly lower than the district as a whole, and also lower than spending on average across the state. However, this changes year over year, and in past years, expenditures have been comparatively higher. Similarly, Morro Bay High School's per pupil spending was $9,463, which was slightly lower than other schools in the district, but higher than the statewide average. Average class size for both schools was 24. The student to teacher ratio was 14.8 at Del Mar and 18.7 at Morro Bay High, both lower than the district as a whole as shown in Table 6.10.

The Federal Elementary and Secondary Education Act (ESEA), also known as No Child Left Behind (NCLB), establishes the definition of highly qualified teachers as having at least a bachelor's degree, an appropriate California teaching credential, and demonstrated core academic subject area competence. Using this definition, both schools have 100 percent highly qualified teachers.

Table 6.10
San Luis Coastal Unified Schools staffing ratios (2013–2014)

Grades	Student: Teacher ratio
K-3	25 : 1
4-6	28.5 : 1
7-12	31 : 1.2

Source: San Luis Coastal Unified School District 2015 Budget Adoption Report

The district assumed a $4.4 million budget reduction in 2014–2015 for its "fair share" of the state-mandated cuts to education, and this reduction has carried over to the 2015–2016 year. The total budget for the 2015–2016 year was $80.4 million. School site discretionary allocations are budgeted based on current year California Basic Educational Data System data.

During the 2013–14 school year, San Luis Coastal USD updated its Facility Master Plan. This process included updating educational specifications, conducting a needs assessment, and putting together a vision for potential facility plans throughout the district. It provides macro-level information about the buildings, grounds, existing conditions, and enrollment in the district and overlays this information on each site to help visualize the potential transformation into a more optimal facility for teaching and learning. The full cost of the recommended updates is $400 million. Voters approved Measure D in November 2014, which could generate $177 million in bond money for school repairs, modernization, upgrades, and new construction identified as priorities in the Facility Master Plan. A Measure D Citizens' Oversight Committee oversees and approves expenditures of the monies, in accordance with the bond authorization.

The 2015–2016 budget for the San Luis Coastal USD is approximately $80.45 million. The largest source of district revenue (approximately $63.90 million) comes from local property taxes. Other large sources of revenue include the federal Special Education program, NCLB grants, and the California state lottery (San Luis Coastal Unified School District 2015a). One of the largest sources of property taxes in the district, the Diablo

Canyon nuclear plant operated by the Pacific Gas and Electric Company (PG&E), is set to close in 2025. The closure of the plant will likely mean a loss of approximately $9.52 million annually to the district, although district officials suggest that increased state funding to schools may be able to at least partially make up the gap (Finucane, Leslie, and Sneed 2016).

Facilities Maintenance

San Luis Coastal USD maintenance staff ensures that repairs necessary to keep schools in good repair and working order are completed in a timely manner. A work order process is used to ensure efficient service and that emergency repairs are given the highest priority. Many San Luis Coastal USD facilities were rehabilitated as part of the Measure A Building Program, which began in 1996. In general, district facilities are in very good shape. According to the 2014/2015 School Accountability Report Cards for Del Mar Elementary School and Morro Bay High School (San Luis Coastal Unified School District 2015b, 2015c), system inspections show that school structures are in good condition.

COMMUNITY HEALTH

Medical Facilities

There are no hospitals in Morro Bay, but there is an urgent care clinic located at 783 Quintana Road. There are also a number of health clinics and hospitals within 20 miles. Nearby hospitals are identified in Table 6.11.

Table 6.11
Hospitals Located Near Morro Bay

Hospital	Location	Distance from Morro Bay
Sierra Vista Regional Medical Center	San Luis Obispo	12.4 miles
French Hospital Medical Center Dignity Health Hospital	San Luis Obispo	13.8 miles
Atascadero State Hospital	Atascadero	18.1 miles
Twin Cities Community Hospital	Templeton	23.5 miles

Five public health clinics are located in San Luis Obispo County: one in the City of Morro Bay at the corner of Quintana Road and Kennedy Way; two clinics in San Luis Obispo; one clinic in Grover Beach; and one clinic in Paso Robles.

The Public Health Department of San Luis Obispo County offers a range of health services, including many at these clinics. Services include environmental health services, family health programs, emergency medical services, and public health education.

Senior Services

A number of services oriented toward or of special importance to seniors are provided by the City in concert with county and other organizations.

Transportation

In partnership with the City, Morro Bay Senior Citizens, Inc. (MBSCI), a local nonprofit organization, has developed a Senior Transportation Program (STP) for the local community. Seniors can call a hotline operated by the MBSCI to request a vehicle and driver. Priority is given to medical-related appointments, but service is provided for a range of nonmedical trips as well. The City also operates Call-A-Ride and fixed-route transit services.

Services

The City participates in the Good Neighbor Program, a volunteer effort designed to bridge gaps in safety net services for seniors over 55 and adults over 18 with disabilities throughout San Luis Obispo County. Volunteers donate their time and talents to provide services such as light housework, yard work, minor home repairs, meal preparation, and shopping.

Activities

The MBSCI operates a senior citizens center on Kennedy Way. The center provides a range of informational sessions as well as free health screenings (e.g., blood pressure, pulse, weight readings). The Senior Legal Services Project, a nonprofit organization dedicated to helping seniors with their legal needs, provides scheduled appointment consultations at the center once a month. The City of Morro Bay Recreation Department

also highlights ongoing classes oriented toward seniors including music classes, dance and art clubs, and various exercise programs.

OTHER SERVICES AND FACILITIES

Port and Fishery Facilities

The port and fishery facilities play an important role in Morro Bay's economy. In 2013, more than $250 million in commercial fishing earnings were landed through the City's port. Port infrastructure is a key component of the Morro Bay fishing industry. Critical infrastructure, such as docks, piers, offloading hoists, ice, and fuel, attract visiting vessels and add to commercial fishing activity and earnings.

There are presently four offloading facilities in Morro Bay. Ocean Star Trading Inc. took over a wharf owned by Morro Bay Commercial Fisherman's Organization (MBCFO) in 2008, and operates an offloading facility there. Morro Bay Fish Company operates a facility at 715 Embarcadero and a facility at Santa Monica Seafood at 1235 Embarcardero, and DeGarimore's operates a facility at 1099 Embarcadero. Each facility provides bait. DeGarimore's also dispenses fuel, gasoline, and ice. The MBCFO operates a 35 ton storage capacity/18 ton per day ice processing facility. There is one small commercial fish processing facility, Tognazzini's Dockside Too, that has a capacity of about one ton per week.

Morro Bay has experienced declining port infrastructure in recent years. Much of the fishing infrastructure was developed, maintained, and expanded during the 1980s and 1990s when Morro Bay was a major groundfish port with over a dozen active trawlers. However, due to an economic slump in the fishing industry between the 1990s and late 2000s, much of the infrastructure suffered from poor maintenance and some components are now out of date for current fishing industry needs. Since that time, the City, in partnership with the MBCFO, has invested in extensive planning and infrastructure improvements. The California Coastal Conservancy funded the preparation of a waterfront restoration plan, and provided $1.2 million for a variety of waterfront projects including pier and dock reconstruction, urban parkland acquisition, floating slip construction, a waterfront park, public access facility planning and construction, and commercial fishing gear storage. Additional infrastructure investments would continue to foster the recovering industry. The City is currently considering

investment in additional infrastructure, including a new boatyard, and improvements to respond to rising sea levels such as raised foundations, floating facilities, and new levees.

6.2 REGULATORY SETTING

The following federal, state, and local plans, policies, regulations, and laws pertain to public services, utilities, and recreation in Morro Bay.

FEDERAL

Water, Wastewater, and Storm Drainage

National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves from flood damages. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce floodplain management ordinances that meet or exceed Federal Emergency Management Agency (FEMA) requirements to reduce the risk of flooding. These ordinances should reduce future flood risks to new construction in Special Flood Hazard Areas (SFHA). The SFHAs and other risk premium zones applicable to each participating community are depicted on Flood Insurance Rate Maps. FEMA manages the NFIP and oversees the floodplain management and mapping components of the program.

Clean Water Act and National Pollutant Discharge Elimination System

Authorized by the Clean Water Act in 1972, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Any industrial, municipal, or other facility which discharges directly to surface waters must obtain permits through the authorized states. In California, the State Water Resources Control Board (SWRCB) serves as the authorized agency to issue NPDES permits.

STATE

Waste and Recycling

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the California legislature passed the California Integrated Waste Management Act of 1989 (AB 939, Statutes of 1989), effective January 1990. According to this act, all cities and counties were required to divert 25 percent of all solid waste from landfill facilities by January 1, 1995, and 50 percent by January 1, 2000.

To help in the increase of diversion rates, each jurisdiction is required to create an integrated waste management plan. Each city plan must demonstrate integration with the relevant county plan. The plans must promote source reduction, recycling and composting, and environmentally safe transformation and land disposal. Elements of the plans must be updated every five years.

AB 939 established the California Integrated Waste Management Board to oversee integrated waste management planning and compliance. The bill's passage led to the refinement of a statewide system of permitting, inspections, maintenance, and enforcement for waste facilities in California, and also required the board to adopt minimum standards for waste handling and disposal to protect public health and safety and the environment. The board is responsible for approving permits for waste facilities, approving local agencies' diversion rates, and enforcing the planning requirements of the law through local enforcement agencies. Local enforcement agencies are responsible for enforcing laws and regulations related to solid waste management, issuing permits to solid waste facilities, ensuring compliance with state-mandated requirements, coordinating with other government agencies on solid waste-related issues, and overseeing corrective actions at solid waste facilities. These agencies inspect facilities, respond to complaints, and conduct investigations into various aspects of solid waste management.

Assembly Bill 341

AB 341 was passed in 2011 and went into effect in 2012. It requires all businesses in California that produce more than 4 cubic yards of commercial waste weekly, and all multi-family housing units with at least five housing units, to provide recycling service. Jurisdictions must implement AB 341 through education and public outreach programs and may also impose additional enforcement if desired through actions such as adopting mandatory recycling ordinances or imposing fines for noncompliance. CalRecycle evaluates the implementation of AB 341 during review of the Integrated Waste Management Act. If jurisdictions are not making an effort to implement, they may be placed on a compliance order.

Public Resources Code Section 4649.8 et seq.

Public Resources Code Section 42649.8 et seq. requires mandatory organic waste (e.g., food waste, green waste/yard trimmings, food-soiled paper waste) recycling services for commercial businesses. Local communities must set up a recycling program for commercial organic wastes by the beginning of 2016. Beginning April 1, 2016, businesses that produce 8 cubic yards of waste a week must participate in the organic waste recycling program. Beginning January 1, 2017, businesses producing at least 4 cubic yards of waste a week must also participate, and beginning January 1, 2019, businesses producing at least 2 cubic yards of waste a week must participate unless granted a deferment for one year. The law also requires that local communities annually report progress toward these goals to CalReycle, which will review implementation of the program as part of its authority under the Integrated Waste Management Act.

Water, Wastewater, and Storm Drainage

Senate Bill 610

Senate Bill (SB) 610 (Section 21151.9 of the Public Resources Code and Section 10910 et seq. of the Water Code) requires the preparation of water supply assessments for large developments (e.g., for projects of 500 or more residential units; at least 500,000 square feet of retail commercial space; or at least 250,000 square feet of office commercial space). It is unlikely that this type of development will occur in Morro Bay.

Groundwater Management Act

The Groundwater Management Act, AB 3030, signed into law in 1992, provides a systematic procedure for, but does not require, an existing local agency to develop a groundwater management plan. This section of the code provides such an agency with the powers of a water replenishment district to raise revenue to pay for facilities to manage the basin (extraction, recharge, conveyance, and quality). In some basins, groundwater is managed under other statutory or juridical authority (such as adjudicated groundwater basins) and is not subject to the provisions of this act for groundwater management plans.

Urban Water Management Act

The California Urban Water Management Planning Act of 1983 requires that each urban water supplier, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare, update, and adopt its Urban Water Management Plan (UWMP) at least once every five years on or before December 31, in years ending in 5 and 0. The plan describes and evaluates sources of water supply, projected water needs, conservation, implementation strategy, and schedule. The City last prepared an UWMP in 2010 and is currently preparing the 2015 UWMP.

Water Conservation Act of 2009

The Water Conservation Act of 2009 (SB X7-7) affects urban water and agricultural water. The 20x2020 Water Conservation Plan sets forth a statewide road map to maximize the state's urban water efficiency and conservation opportunities between 2009 and 2020 and beyond for urban water. It aims to set in motion a range of activities designed to achieve the 20 percent per capita reduction in urban water demand by 2020. These activities include improving an understanding of the variation in water use across California, promoting legislative initiatives that incentivize water agencies to promote water conservation, and creating evaluation and enforcement mechanisms to ensure regional and statewide goals are met. The City is required to establish water conservation targets for the years 2015 and 2020. Alternative approaches are also specified in the law (Division 6 Part 2.55 of Water Code Sections 10608–10631.5).

Sewer System Management Plan

The SWRCB adopted new policies in December 2004 requiring wastewater collection providers to report sanitary sewer overflows and to prepare and implement sewer system management plans (SSMP). SSMP requirements are modeled on proposed federal capacity, management, operations, and maintenance plans. The SSMP policy requires dischargers to provide adequate capacity in the sewer collection system, take feasible steps to stop sewer overflows, identify and prioritize system deficiencies, and develop a plan for disposal of grease, among other requirements. In addition, wastewater providers must now report sanitary sewer overflows to the Los Angeles Regional Water Quality Control Board, must keep internal records of these overflows, and must produce an annual report on overflows. Overflows from laterals on private property, if caused by an owner, are not required to be reported.

Energy

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates a variety of privately owned utilities, including electricity and natural gas companies. The CPUC establishes energy rates for privately owned utility companies, including PG&E, and administers energy efficiency and renewable energy programs, often in conjunction with the California Energy Commission. It regulates the safety of California energy transmission and distribution systems, approves power purchase contracts for privately owned utilities, and reviews applications for new electricity transmission lines. The CPUC also represents California in proceedings before the Federal Energy Regulatory Commission.

Renewables Portfolio Standard (RPS)

California's RPS is codified in Public Utilities Code Sections 399.11–399.32. The RPS requires all retail sellers of electricity in California, including Southern California Edison, to procure 33 percent of their electricity by the end of 2020 from eligible renewable sources. The RPS expanded in scope in 2015, when Governor Brown signed SB 350 into law. This legislation established an additional target of 50 percent renewable energy by 2030 for all electricity providers. The program is administered jointly by the California

Energy Commission and the CPUC. Additional discussion of RPS is included in the GHG Emissions Section 2.2 of this background report.

Police and Fire

Fire Prevention Fee (AB X1 29)

On July 7, 2011, AB X1 29 was signed into law, establishing the Fire Prevention Fee. The bill required the state Board of Forestry and Fire Protection to establish emergency regulations to implement the new fee at an amount not to exceed $150 per habitable structure within the State Responsibility Area plus an inflation cost adjustment factor. The state uses the money collected from fees to fund a variety of fire prevention activities as specified in the law.

California Occupational Safety and Health Administration

In accordance with the California Code of Regulations, Title 8, Sections 1270 and 6773, the California Occupational Safety and Health Administration has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

Uniform Fire Code

The Uniform Fire Code contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The code also contains specialized technical regulations related to fire and life safety.

Schools

California Department of Education Facilities and Planning Division

The California Education Code contains various provisions governing the siting, design, and construction of new public schools (e.g., Education Code Sections 17211, 17212, and 17212.5). In addition, to help focus and manage the site selection process, the Department of Education's School Facilities and Planning Division has developed screening and ranking procedures based on criteria commonly affecting school selection (Education Code Section 17251[b], Title 5 of the California Code of Regulations, Section 14001[c]). The foremost consideration in the selection of school sites is safety. Certain health and safety requirements are governed by state statute and Department of Education regulations. In selecting a school site, a school district should consider factors such as proximity to airports and railroads, proximity to high-voltage power transmission lines, presence of toxic and hazardous substances, and hazardous air emissions within one-quarter mile.

School Facility Fees

Education Code Section 17620 authorizes school districts to levy a fee, charge, dedication, or other requirement against any development project for the construction or reconstruction of school facilities, provided that the district can show justification for levying of fees. Government Code 65995 limits the fee to be collected to the statutory fee (Level I) unless a school district conducts a Facility Needs Assessment (Government Code Section 65995.6) and meets certain conditions. These fees are adjusted every two years in accordance with the statewide cost index for Class B construction, as determined by the State Allocation Board.

SB 50 (1998) instituted a new school facility program by which school districts can apply for state construction and modernization funds. This legislation imposed limitations on the power of cities and counties to require mitigation for school facility impacts as a condition of approving new development. Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property" (Government Code Section 65996[b]). Additionally, a local agency cannot require participation in a Mello-Roos district for

school facilities; however, the statutory fee is reduced by the amount of any voluntary participation in a Mello-Roos district. Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation" under the California Environmental Quality Act.

REGIONAL AND LOCAL

Waste and Recycling

Municipal Code Section 8.16

Municipal Code Section 8.16 is the City's solid waste management ordinance. The ordinance is intended to conserve disposal capacity, and to provide for an efficient solid waste management system which includes collection of solid waste and recyclable materials. The ordinance requires solid waste permits and removal of solid waste and recyclables to designated collection sites. The ordinance also lays out the requirements and obligations for any waste contract entered into by the City.

Expanded Polystyrene Ordinance

In 2016, the Morro Bay City Council passed an ordinance regulating the use and sale of expanded polystyrene (commonly referred to as Styrofoam) food containers and products. The ordinance is intended to protect the natural environment and decrease the amount of waste sent to landfills. The ordinance applies to all businesses in the City of Morro Bay including restaurants, bars and pubs, cafeterias, caterers and event organizers, convenience and liquor stores, delis and coffee shops, ice cream and yogurt shops, mobile food vendors, grocery and drug stores, and retail outlets.

San Luis Obispo County Integrated Waste Management Authority and Programs

The San Luis Obispo County IWMA is charged with planning and implementing regional solid waste and hazardous waste programs. These programs are intended to ensure that member jurisdictions can achieve the state-mandated goal of a 75 percent reduction in solid waste by the year 2020. IWMA participants include San Luis Obispo

County and the Cities of Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo, and several community service districts.

Water, Wastewater, and Storm Drainage

Municipal Stormwater Management Program

The Stormwater Management Program is prepared by the City of Morro Bay to comply with mandatory requirements of the US Environmental Protection Agency NPDES Phase II Final Rule and the SWRCB General Permit. The Stormwater Management Program provides an integrated approach for prevention of pollution from stormwater quality and quantity runoff control. The program relies on public outreach, education, and participation to help prevent pollution problems at the source. Example program actions include requiring low-impact development, preventing illicit discharges, and ensuring that municipal operations do not contribute to pollution.

Storm Drain Master Plan

The 1987 Storm Drain Master Plan includes an atlas of maps cataloging existing and proposed storm drain facilities and an overview of existing drainage conditions. It also recommends capital improvement projects for Morro Bay's sewer infrastructure and measures to implement the plan, including budgeting and financing alternatives.

The plan is out of date and is currently being updated, along with other Public Works water-related master plans, to become the One Water Plan. The One Water Plan represents an integrated and collaborative approach to water supply, wastewater treatment, and stormwater planning, managing the city's future water needs in a way that provides for sustainable, long-term water supplies as well as greater resiliency to drought conditions and climate change.

Water Allocation Program (Resolution No. 06-16)

Chapter 13.20 of the Morro Bay Municipal Code calls for the City Council of the City of Morro Bay to adopt a yearly Water Allocation Program based on a report by the Public Works director. Ordinance Number 266 requires the City Council to set an annual limit on new residential units and to prescribe the mix of multi-family and single-family residences allowed within that limit.

In 2016, the City Council adopted a Water Allocation Program (Resolution No. 06-16), which states that 95.08 available water equivalent units (WEUs) are available for 2016. The Water Allocation Program also notes that any additional allocations must be offset on a two-to-one basis by providing retrofits to existing uses or by paying an in-lieu fee of $6,032 per WEU. For a full description of how WEUs relate to development potential, please refer to Morro Bay Municipal Code Section 13.20.070.

Police and Fire

Cal Fire/San Luis Obispo County Fire Consolidated Fire Protection Strategic Plan

The Cal Fire/San Luis Obispo County Fire Consolidated Fire Protection Strategic Plan, adopted in 2012, is a planning document that serves as a guide for the Board of Supervisors and other partners in the Cal Fire/San Luis Obispo County Fire consolidated fire protection program. It identifies desired levels of service for fire protection, makes an assessment of the current delivery system, and forecasts necessary changes to fire protection services. The plan describes and presents data regarding fire protection in the county using community demographics, service levels, staffing models, governance, and funding options.

Other

Morro Bay and Port San Luis Commercial Fisheries Business Plan

The Morro Bay and Port San Luis Commercial Fisheries Business Plan, completed in 2008, complies with the project implementation requirements of the California Coastal Conservancy grant to the City of Morro Bay to fund the Conserving the Working Waterfront and Ocean Habitats: Morro Bay and Port San Luis Harbors program. The plan provides a framework and recommendations to enable Morro Bay fisheries to increase revenue while attaining conservation goals.

Morro Bay Fishing Community Sustainability Plan

The Morro Bay Fishing Community Sustainability Plan satisfies a requirement of a grant awarded by the National Fish and Wildlife Foundation to develop Community

Sustainability Plans (CSP). The foundation grant funded Morro Bay's studies of the economic, social, and environmental implications of fishing industries and working waterfronts. CSPs are cited in the Magnuson Stevens Fishery Conservation and Management Act as a requirement for communities that wish to remain eligible to participate in programs such as the Individual Transferable Quota that was instituted in the federal groundfish fishery in 2011. The act is the overriding law for all federal fisheries in the United States. The Morro Bay CSP assesses critical infrastructure and services; quantifies the number of jobs supported by the fishing industry; addresses synergies with tourism, aquaculture, and recreational fishing; and distinguishes fishing's prominent role in Morro Bay's cultural identity and marine stewardship.

6.3 PRIORITY FINDINGS

WATER SUPPLY AND DESALINATION

Morro Bay's access to flows from the SWP, groundwater, and desalination provide several backups to cover shortfalls or contamination problems from any one source. However, no single water source will be capable of meeting projected demands. The City needs to ensure that it has sufficient water supplies to serve the community, including in situations when existing water supplies are threatened by long-term drought conditions. Potentially available actions that have been considered by the City include:

- Purchasing additional SWP drought buffer from County's unallocated SWP entitlement.
- Purchasing additional SWP allocation.
- Upgrading the wastewater treatment plant to tertiary treatment to provide recycled water.
- Upgrading the desalination plant processes to resolve iron fouling issues.
- Constructing additional groundwater wells to increase the City's supply from local groundwater basins.
- Increasing water conservation efforts in the community to improve the efficient use of existing water supplies.

- Replacing water lines as needed to reduce leakage, and exploring the feasibility of rainwater capture and storage systems.

The second option, to purchase an additional SWP allocation, is currently considered cost prohibitive as it would require upgrades to delivery capacity at the Polonio Pass Treatment Plant. In January 2013, the California Coastal Commission denied the permit for construction of an upgraded wastewater treatment plant at the MBCSD's existing location on the basis of zoning inconsistency, failure to avoid coastal hazards, failure to include a sizable reclaimed water component, and the project's location within a designated sensitive view area.

The appropriate infrastructure improvements necessary to prevent iron fouling issues caused at the desalination plant have not yet been studied at depth, but remain an option for increasing water supply from the plant.

WASTEWATER TREATMENT PLANT REPLACEMENT

Morro Bay's existing wastewater treatment plant, jointly owned by the City of Morro Bay and the Cayucos Sanitary District, was built in 1954. The aging plant does not meet minimum Clean Water Act standards; the plant has operated for some time under a Clean Water Act Section 301(h) waiver, which allows it to discharge treated effluent that does not meet full secondary treatment standards. The existing plant is located at 160 Atascadero Road in Morro Bay, and initial plans to replace it on-site were denied by the Coastal Commission. The City is now working to locate an appropriate new site and build a replacement plant as quickly as possible in order to stop environmental damage that results from the discharge of insufficiently treated effluent into the ocean.

The City currently also has a pending application with the Central Coast Regional Water Quality Control Board that would extend Morro Bay's permit for its existing plant for five more years. The five-year timeline to build the new plant would coincide with the expiration of that permit and honor an agreement with the board to phase out its need to discharge treated wastewater into the ocean.

A range of sites have been considered for siting the new plant. As of June 2016, the City was considering multiple sites, including one just north of the intersection of State Route 1 and South Bay Boulevard, one in Morro Valley called Righetti Ranch, and one in the southeastern corner of Rancho Colina on Highway 41. The City must negotiate with the

private owners for use or purchase of these properties. Sewer bills for Morro Bay residents are expected to nearly double over the next four years to help pay for the new plant and other updates to the sewer collection infrastructure. The Morro Bay City Council approved the new rate structure, which includes an even larger increase in water bills, prior to Cayucos deciding to pull out of the wastewater plant project.

CONTRACT FIRE SERVICE DELIVERY

The City has considered two alternative recommendations related to the provision of fire suppression services in the city. The existing City model relies significantly on part-time reserve firefighters to supplement daily staff. Due to the geographic and demographic constraints that limit Morro Bay's ability to recruit and train staff, having a paid on-call fire service is not a viable option. The Cal Fire contract option was explored during 2007 and 2008. A series of community workshops and staff analysis have been conducted regarding the option to contract with Cal Fire to provide service. Analysis conducted by the Morro Bay fire chief suggests that Cal Fire could provide comparable levels of service to those offered by the existing municipal fire department. Assuming similar contract costs as the Los Osos Community Services District, the operational costs for Cal Fire services are likely to be close to the City's existing expenditure levels. However, should the City pursue contract personnel through Cal Fire, the City's unfunded pension liability obligation would likely decrease. Determining if cost savings can be generated by contracting for fire service remains an open issue. At this time, the City is not exploring contract fire service delivery.

NEW PORT INFRASTRUCTURE (BOATYARD AND SEA LEVEL RISE ADAPTATION FACILITIES)

The fishing industry, civic leaders, and stakeholders on Morro Bay's waterfront have identified the need for a boatyard—a facility capable of hauling out, repairing, maintaining, and storing vessels. The existing boatyard in Morro Bay at 261 Main Street (Morro Bay Boatyard) is limited by its capacity to accommodate approximately one 30-foot boat at a time.

As identified in Chapter 3.0 (Coastal Resources and Resiliency), sea level rise will have an adverse effect on existing fishery and dock infrastructure. Improvements and alterations to these structures could help provide greater adaptability for the industry in the years ahead.

USE OF THE PG&E SUBSTATION IN RELATION TO THE DECOMMISSIONED DYNEGY FACILITY

The Morro Bay Power Plant, decommissioned in 2014, occupies a prominent visual place on the Morro Bay coast. A decision for what to do with the property and decommissioned plant facilities has not yet been made. Dynegy, a Houston-based company that owns most of the property, has leased portions of the property and put the remainder up for sale. The power plant is located adjacent to a substation owned by PG&E, which remains operational.

A potential wind energy project that would use the Dynegy facility is currently being considered by the Coastal Commission. The project could produce electricity for up to 300,000 households and would be the first of its kind in the state. The installation as proposed would result in the installation of 100 floating wind turbines, tethered to the ocean floor about 20 miles offshore. The project is being proposed by the company Trident Winds.

Trident Winds proposes to use the City's outfall facility at the northeast side of Morro Rock as an access point to hook up to the PG&E substation. The outfall was leased by Dynegy as part of the water cooling system for the power plant before the plant was decommissioned in 2014. The City is considering what should be approved in the permits for the Dynegy site. Outreach to the community and stakeholders is ongoing. The City also has an opportunity to make site improvements or to change permitted uses of the PG&E-owned substation adjacent to the Dynegy-owned property.

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7.0 Land Use, Community Form, and Coastal Uses

Plan MORRO BAY

7.0 LAND USE, COMMUNITY FORM, AND COASTAL USES

This chapter identifies existing land use plans, existing "on the ground" land uses, community form, and coastal use conditions in Morro Bay and summarizes applicable regulations for land use and coastal uses.

7.1 EXISTING CONDITIONS

EXISTING LAND USES IN THE PLANNING AREA

Since there are buildings and land uses that existed before the adoption of the current Land Use Element, some on the ground land uses do not match the uses identified in the General Plan. Existing land use data is used to describe what uses are currently in each area of the city (for a description of General Plan Land Use designations, see Section 7.2, Regulatory Conditions).

Existing on-the-ground land use data in the planning area is maintained by the San Luis Obispo Council of Governments (SLOCOG). SLOCOG land use data is collected and analyzed based on the designations given in the San Luis Obispo County General Plan (San Luis Obispo Board of Supervisors n.d.), which are categorized differently, but in a parallel manner, to the Morro Bay General Plan land use designations. Existing on-the-ground land uses for Morro Bay using the SLOCOG designations are provided in Table 7.1, with a map of these land uses provided as Figure 7.1.

Nearly half of the land in Morro Bay is either a part of Morro Bay State Park or the beach. Single-family homes make up another 14 percent; multifamily homes make up less than 1 percent. Parks and open space combined comprise 18 percent of the land area, and combined agricultural uses represent 6.25 percent. Just over 1 percent of the land in Morro Bay is currently undeveloped, and as a result any new population growth will likely require increased redevelopment density or annexation of new land.

Table 7.1
Morro Bay Existing On-The-Ground Land Use

Land Use Designation	Sum of Acres	Percent of Area
Single-Family Residential	605.53	14.03%
Multiple-Family Residential	39.51	0.92%
Downtown	31.27	0.72%
Commercial Retail/Office	63.34	1.47%
Commercial Service/Industrial	74.61	1.73%
School	75.93	1.76%
Major Public Facility	99.97	2.32%
Public Facility/Public Land	26.46	0.61%
Cultural Facility/Religious Facility/Event Center	19.42	0.45%
Visitor-Serving	19.79	0.46%
Community Park/Regional Park/Golf Course/Other Recreation	388.10	8.99%
Open Space Area/Conservation Area/Riparian Area	397.59	9.21%
State Park/Beach	2,139.06	49.55%
Undeveloped	54.02	1.25%
Agriculture (Other)	216.82	5.02%
Agriculture (Grazing/Ranchland)	54.14	1.25%
Road/Other	11.11	0.26%
Total	4,316.70	100.00%

Source: San Luis Obispo Council of Governments 2016

The planning area also includes approximately 100 acres outside of the city limits but within Morro Bay's sphere of influence (SOI), which is under county jurisdiction but indicates the city's probable future boundary and service area. Most of Morro Bay's SOI is part of the Morro Bay Estuary located just outside of the marina, and allows the City to more effectively permit dredging and other maintenance activities. Morro Bay's SOI also includes a small beachfront amount of land at the northern end of the city, west of Highway 1. The planning area boundaries may be redefined as work on *Plan Morro Bay* proceeds.

Figure 7.2 presents a map of the existing General Plan land use designations. Some of these designations or allowed uses differ from existing on-the-ground land uses.

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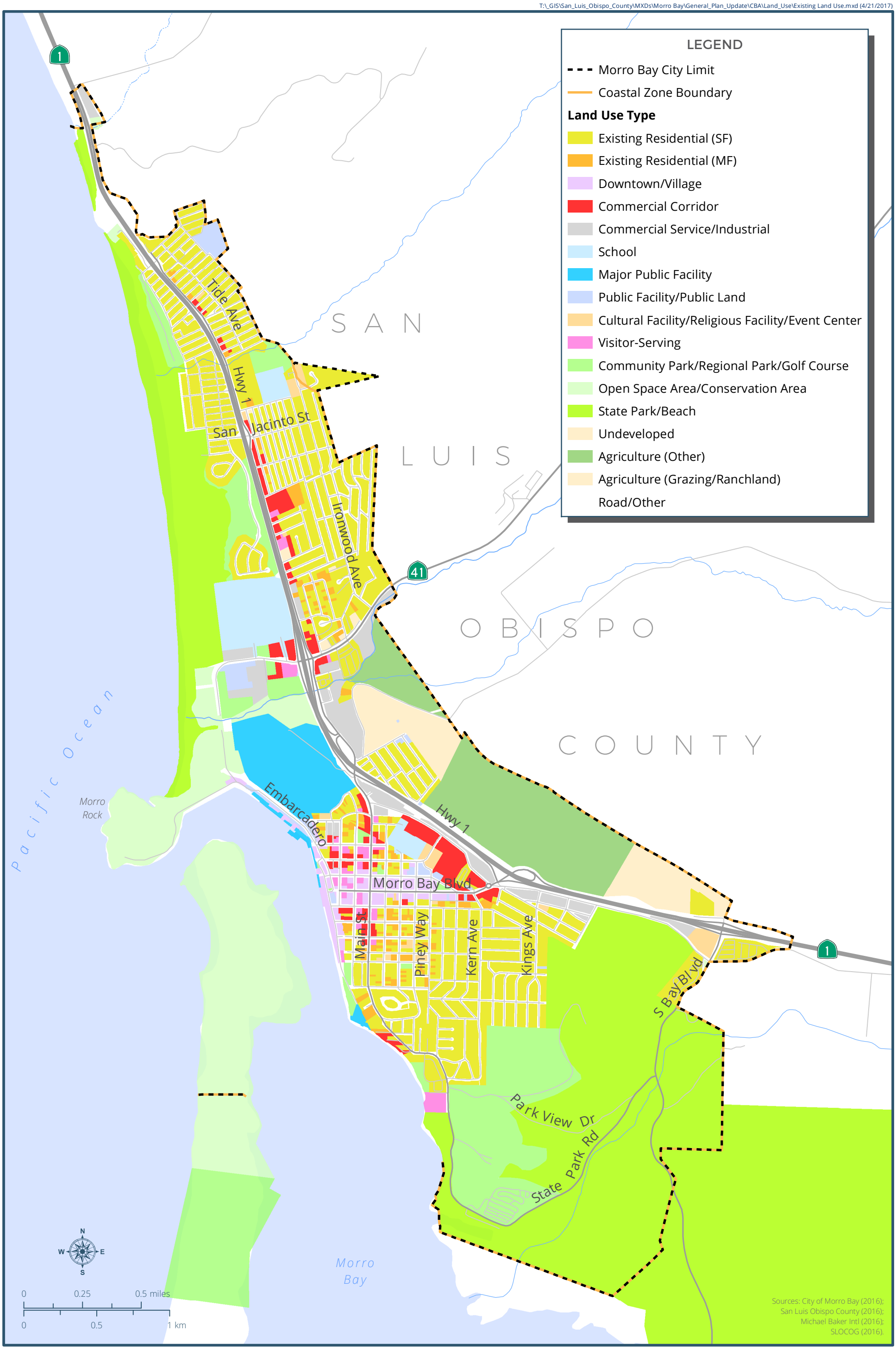

FIGURE 7.1

Existing On-The-Ground Land Use

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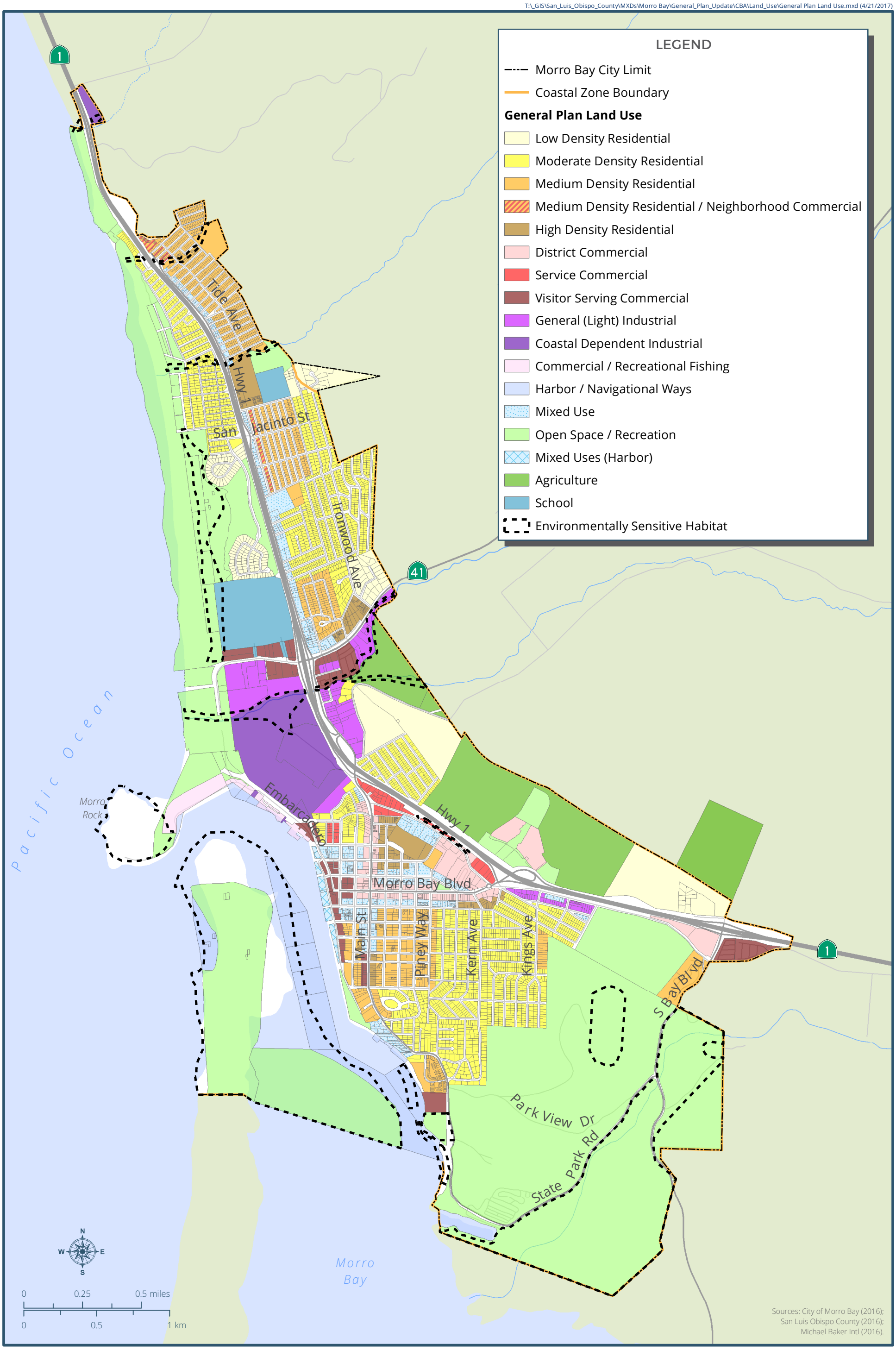


FIGURE 7.2

Existing General Plan Land Use Designations

Page 2

COASTAL-DEPENDENT USES

With the exception of a small part in the northeastern area, nearly all of the city is located in the Coastal Zone. The Coastal Zone boundary is defined by the California Coastal Act, which also defines and prioritizes coastal-dependent uses. The Coastal Zone boundary aligns with Ironwood Avenue for about half of the block between Sequoia Court and where Ironwood Avenue dead-ends into Del Mar Park. The area outside the Coastal Zone includes the Church of Jesus Christ of Latter Day Saints and five residences located on Sequoia Court. All other uses within the city described above are found in the Coastal Zone.

The Coastal Act places a high priority on coastal-dependent uses, which includes prioritizing the protection and maximization of recreation and visitor-serving land uses, including low- or moderate-cost amenities within the Coastal Zone. Visitor-serving uses include hotel and lodging accommodations, commercial fishing infrastructure and facilities, restaurants, parking facilities, and shopping or entertainment uses for visitors and tourists. The majority of existing recreational or visitor-serving uses are found in The Embarcadero, Downtown, and State Park areas. Other coastal-dependent uses include agriculture, aquaculture, coastal industrial uses, and energy-related uses.

Per Measure D, certain areas are designated for commercial fishing infrastructure and facilities. These areas are located on the north Embarcadero and are designated CF on the City's Zoning Map. The purpose of the CF District is to promote and accommodate the commercial fishing industry and noncommercial recreational fishing activities in appropriate waterfront areas (City of Morro Bay 2008).

Affordable Accommodations

The Coastal Act requires that all members of the public have equal access to the coast. Development cannot interfere with this right, and adequate parking, facilities, and accommodations must be available and affordable for the general public to use. In addition, the provision of lower-cost visitor-serving accommodations is a primary goal when protecting and maximizing recreation and visitor-serving land uses (Coastal Act Sections 30212.5, 30213, 30220 through 30224, 30250, 30252, 30253(5), and 30254). The below outlines tourism statistics in Morro Bay, and provides a description of visitor-serving overnight accommodations available in the city.

Tourism Trends in Morro Bay

TOT Taxes and Occupancy Rates

Data provided by the Morro Bay Tourism Bureau show that Morro Bay is a significant tourist destination on the Central Coast. This is exemplified by revenue from transit occupancy tax (TOT) funds in fiscal year 2014–2015 and fiscal year 2015–2016 to date. TOT revenues comprise taxes collected from motels, RV parks, and vacation rentals.

The majority of TOT are generated from motel guests. In fiscal year 2014–2015, the City generated $2.9 million in TOT, of which approximately $2.4 million was from motels. The highest revenue-generating months were June, July, and August. Motel occupancy rates ranged from 47 percent to 83 percent in that year, with higher occupancy rates occurring in the summer months. Thus far in fiscal year 2015–2016, the City has generated $1.9 million in TOT, of which approximately $1.5 million was from motels. Occupancy rates have ranged from 43 percent to 85 percent, again with higher rates during summer months. Figure 7.3 shows the taxes collected, along with occupancy rates between July 2014 and January 2016.

While motels generate the majority of TOT, trailer parks and vacation rentals also contribute to this revenue. In fiscal year 2014–2015, trailer parks generated approximately $200,580 in TOT, and vacation rentals generated approximately $279,393 in TOT. Figure 7.4 shows tax revenue generated from all visitor-serving accommodations between July 2014 and January 2016.

The large increase in TOT generated by vacation rentals from 2014 to 2016 is due to a business license audit conducted by the City. Prior to this audit, there were many unlicensed vacation rentals that were not generating TOT.

Figure 7.3
Motel Tax Collected and Motel Occupancy Rates (July 2014–January 2016)

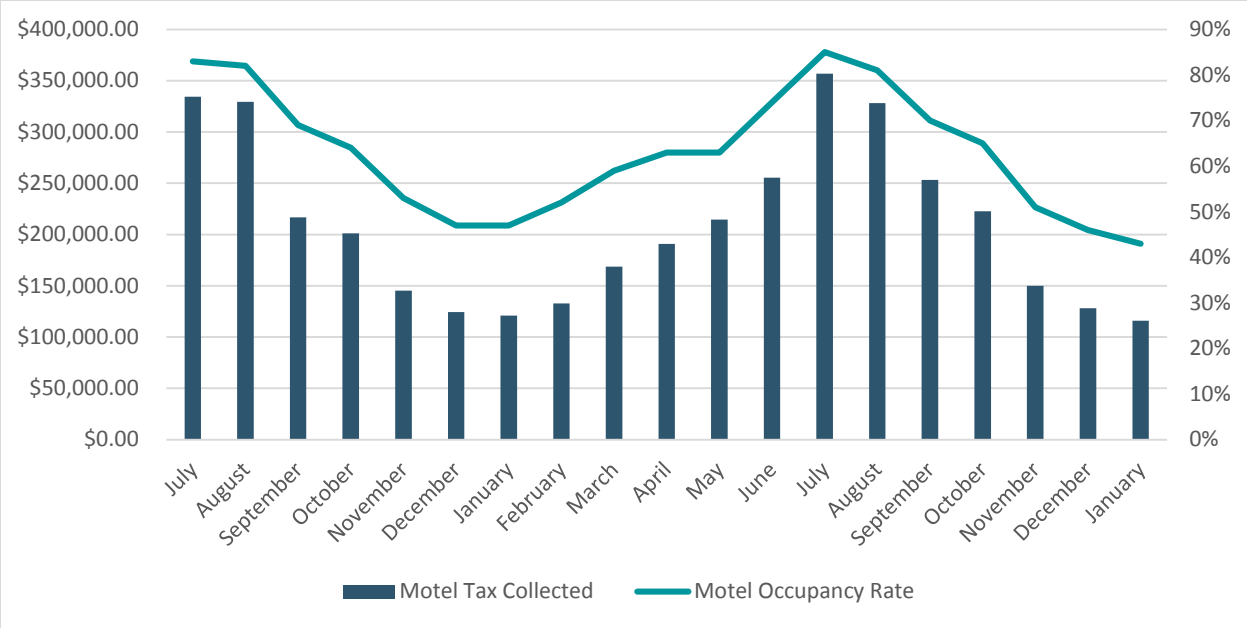
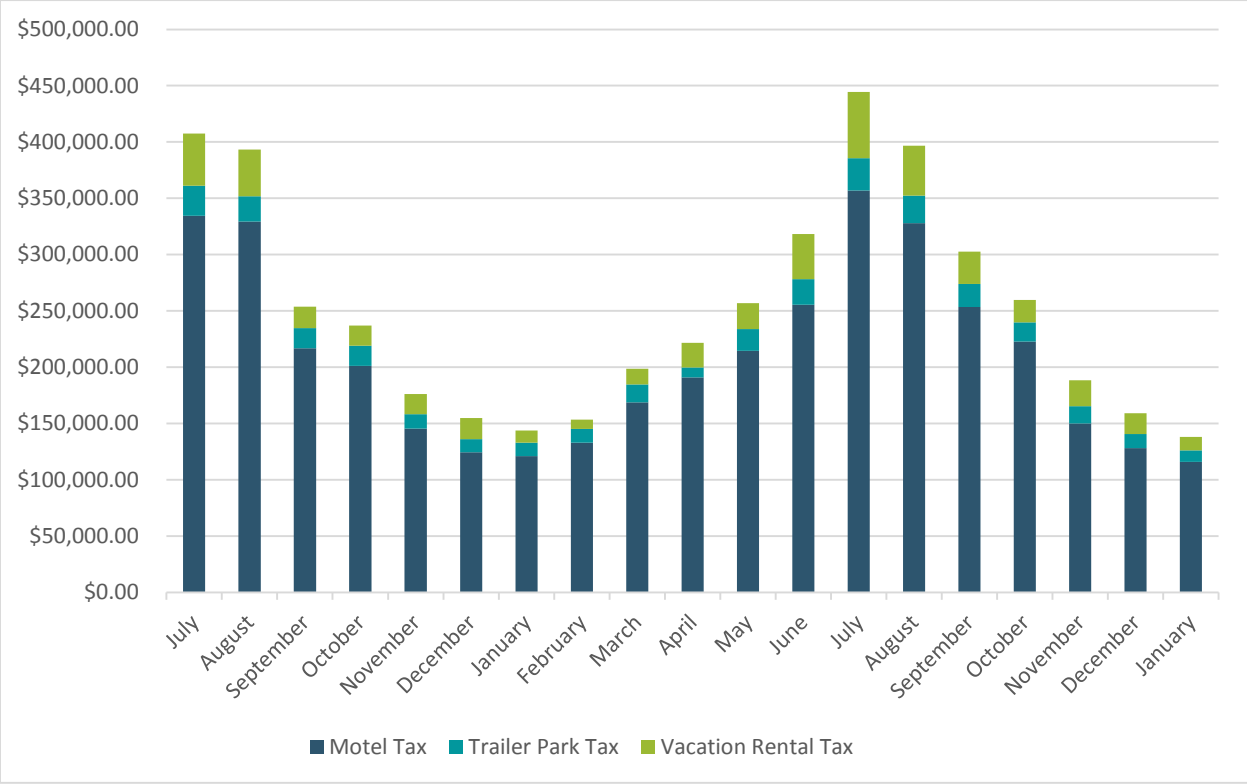


Figure 7.4
Transient Occupancy Tax – Motels, Trailer Parks, and Vacation Rentals (July 2014–January 2016)



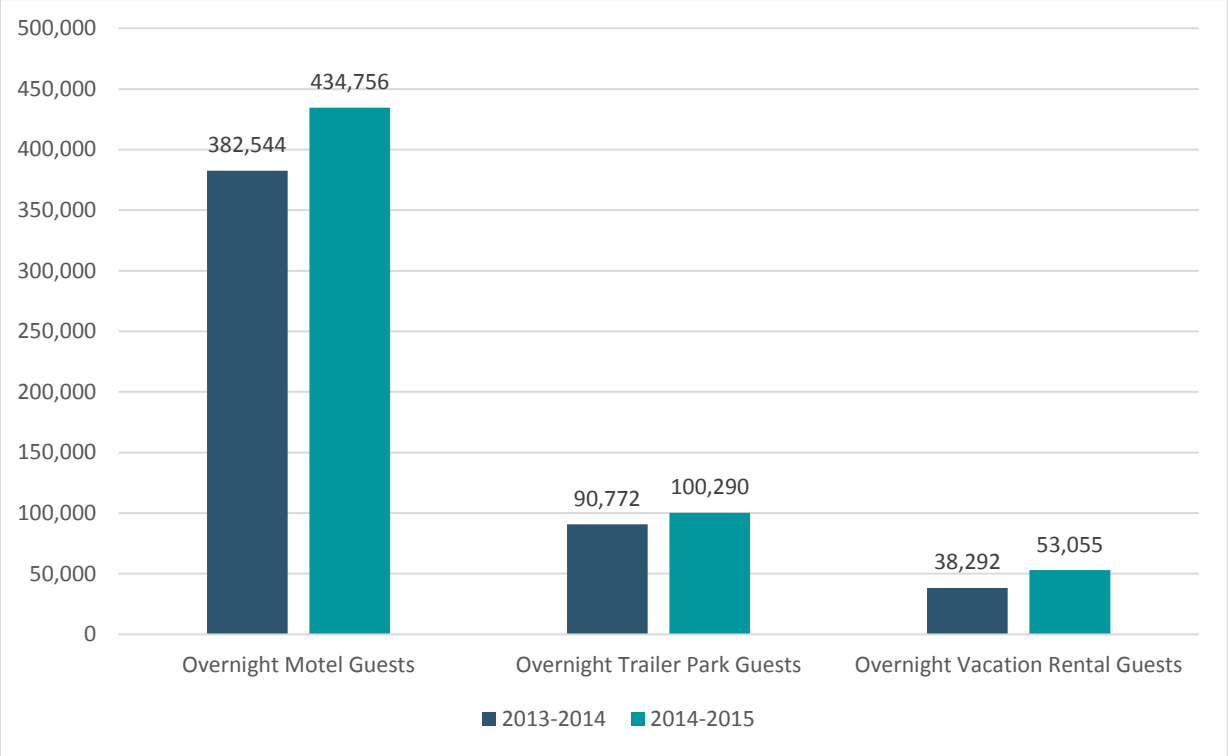
Motel, Trailer Park, and Vacation Rental Guests

Morro Bay Tourism Bureau data from hotel, motel, and vacation rental receipts provides estimates on overall overnight guests in Morro Bay per year in fiscal years 2013–2014 and 2014–2015.

In fiscal year 2013–2014, Morro Bay had an estimated 382,544 overnight hotel/motel guests, 90,772 overnight camping guests, and 38,292 overnight vacation rental guests. This had a $43 million economic impact to Morro Bay. In fiscal year 2014–2015, Morro Bay had an estimated 434,756 overnight hotel/motel guests, 100,290 overnight camping guests, and 53,055 overnight vacation rental guests. This had a $48.9 million economic impact on Morro Bay.

Figure 7.5 shows these trends from 2013 to 2015. The increase in number of vacation rentals from 2013 to 2015 is also due to the business license audit conducted by the City, which factored in previously unlicensed vacation rentals.

Figure 7.5
Estimated Guests at Overnight Accommodations (2013–2014 and 2014–2015)



Overnight Visitor-Serving Accommodations in Morro Bay

Michael Baker International evaluated visitor-serving overnight accommodation options and usage in the City of Morro Bay in March 2016 to determine existing conditions and methods to comply with the California Coastal Act. This survey found a variety of options at a variety of price levels in the city. Pricing information was obtained using internet searches of advance prices available on each accommodation's website for the date of June 23, 2016, to obtain insight on pricing in popular summer months. The prices selected and shown in Tables 7.2 and 7.3 reflect the least expensive options available for that date; all accommodations surveyed have a variety of pricing options, with the exception of campgrounds and RV parks.

Currently, low-cost accommodations are defined as those that are at or below the state median from April 2012 (most recently available) of $118.07 per night (Smith Travel Research 2012). This number changes over time and should be confirmed on a regular basis during the horizon of this plan. In total, there are 42 overnight accommodation options in Morro Bay. This number includes hotels, motels, inns, bed & breakfasts (B&Bs), campgrounds, and RV parks, but does not include short-term rentals. Based on an analysis of the prices for these accommodations, 63 percent are at or below the threshold dollar amount, and would be considered low-cost (Tables 7.2 and 7.3). Figure 7.6 illustrates visitor-serving accommodations in Morro Bay.

Campgrounds and Recreational Vehicle Parks

Morro Bay contains five accommodations that are classified as campgrounds or recreational vehicle (RV) parks. These are typically the lowest cost option for overnight accommodations, and range in price from $30 to $46 per night, with an average cost of $37 per night. All of these are below the amount considered low cost. One of these accommodations, Morro Dunes RV Park, has varying pricing options depending on the hook-up; the remaining sites have one base price. These accommodations range from 8 sites to 170 sites. Between all of the options, there are 516 sites available.

Table 7.2
Visitor-Serving Accommodations Inventory - Hotels, Motels, Inns, and Bed & Breakfast Inns (2016)

Name	Type (motel, hotel, inn, B&B)	Location/Address	Owner	Public/ Private	Lowest Cost per night	Percentage of state median price	Capacity	Notes
Anderson Inn	Inn	897 Embarcadero St, Morro Bay, CA 93442	Anderson Inn	private	$249.00	211%	8	1
Ascot Suites/ "Inn at the Rock"	Inn	260 Morro Bay Blvd, Morro Bay, CA, 93442	Ascot Suites	private	$139.00	118%	32	1
Bay View Inn	Motel	225 Harbor St, Morro Bay, CA 93442	Bay View Inn	private	$69.00	58%	22	1
Bayfront Inn at the Waterfront	Inn	1150 Embarcadero, Morro Bay, CA 93442	Bayfront Inn	private	$129.99	110%	16	1
Beach Bungalow Inn & Suites	Inn	1050 Morro Avenue, Morro Bay, CA 93442	Beach Bungalow	private	$160.55	136%	12	1
Best Western El Rancho	Hotel	2460 Main St, Morro Bay, CA 93442	Best Western	private	$107.99	91%	27	1
Best Western San Marcos	Hotel	250 Pacific Street, Morro Bay, CA 93442	Best Western	private	$125.99	107%	32	1
Best Western Tradewinds	Hotel	225 Beach St, Morro Bay, CA 93442	Best Western	private	$112.49	95%	24	1
Blue Sail Inn	Inn	851 Market Avenue, Morro Bay, CA 93442	Blue Sail Inn	private	$194.99	165%	48	1
Coastal Breeze Inn	Hotel	1098 Main St, Morro Bay, CA 93442	Coastal Breeze Inn	private	$90.00	76%	22	1
Comfort Inn	Inn	590 Morro Avenue, Morro Bay, CA 93442	Choice Hotels	private	$140.00	119%	32	1
Days Inn	Hotel	1095 Main St, Morro Bay, CA 93442	Days Inn	private	$109.00	92%	45	1

Name	Type (motel, hotel, inn, B&B)	Location/Address	Owner	Public/ Private	Lowest Cost per night	Percentage of state median price	Capacity	Notes
Econo Lodge	Hotel	1100 Main St, Morro Bay, CA 93442	Econo Lodge	private	$110.00	93%	18	1
Embarcadero Inn	Inn	456 Embarcadero, Morro Bay, CA 93442	Embarcadero Inn	private	$139.00	118%	32	1
Estero Inn	Inn	501 Embarcadero, Morro Bay, CA 93442	Estero Inn	private	$249.00	211%	8	1
Fireside Inn	Motel	730 Morro Ave, Morro Bay, CA 93442	Fireside Inn	private	$74.00	63%	24	1
Front Street Inn	Inn	1140 Front Street, Morro Bay, CA 93442	Front Street inn	private	$199.00	169%	2	1
Grays Inn	Inn	561 Embarcadero, Morro Bay, CA 93442	Grays Inn	private	$239.00	202%	3	1
Harbor Front Suites	Inn	591 Embarcadero, Morro Bay, CA 93442	Harbor Front Suites	private	$350.00	296%	3	1
Holland Inn and Suites	Hotel	2630 Main St, Morro Bay, CA 93442	Holland Inn	private	$80.10	68%	23	1
La Roche Suites	Inn	575 Embarcadero, Morro Bay, CA 93442	La Roche Suites	private	$350.00	296%	3	1
La Serena Inn	Inn	990 Morro Avenue, Morro Bay, CA 93442	La Serena Inn	private	$153.99	130%	38	1
Marina Street Inn B&B	B&B	305 Marina Street, Morro Bay, CA 93442	Marina Street Inn	private	$140.00	119%	4	2
Masterpiece Hotel	Hotel	1206 Main St, Morro Bay, CA 93442	Masterpiece Hotel	private	$116.99	99%	27	1
Morro Crest Inn	Inn	670 Main St, Morro Bay, CA 93442	Morro Crest	private	$58.00	49%	17	1
Morro Shores Inn & Suites	Hotel	290 Atascadero Rd, Morro Bay, CA 93442	Morro Shores Inn	private	$49.66	42%	30	1

Name	Type (motel, hotel, inn, B&B)	Location/Address	Owner	Public/ Private	Lowest Cost per night	Percentage of state median price	Capacity	Notes
Motel 6	Motel	298 Atascadero Rd, Morro Bay, CA 93442	Motel 6	private	$69.99	59%	70	1
Pacific Cottage Motel	Motel	2830 Alder Avenue, Morro Bay, CA 93442	Pacific Cottage Motel	private	$80.00	68%	14	2
Pacific Shores Inn	Inn	890 Morro Avenue, Morro Bay, CA	Pacific Shores	private	$59.00	50%	22	1
Pleasant Inn Motel	Motel	235 Harbor Street, Morro Bay, CA 93442	Pleasant Inn Motel	private	$119.00	101%	10	1
Rockview Inn and Suites	Inn	1080 Market Ave, Morro Bay, CA 93442	Rockview Inn and Suites	private	$85.00	72%	31	1
Sandpiper Inn	Inn	540 Main St, Morro Bay, CA 93442	Sandpiper Inn	private	$66.00	56%	21	1
Sea Air Inn	Inn	845 Morro Ave, Morro Bay, CA 93442	Sea Air Inn	private	$74.00	63%	25	1
Seaside Inn	Inn	220 Beach St, Morro Bay, CA 93442	Seaside Inn	private	$109.00	92%	33	1
Sundown Inn	Inn	640 Main St, Morro Bay, CA 93442	Sundown Inn	private	$99.00	84%	17	1
The Breakers Motel	Motel	780 Market Ave, Morro Bay, CA 93442	Breakers Motel	private	$113.05	96%	26	1
The Inn at Morro Bay	Hotel	60 State Park Rd, Morro Bay, CA 93442	The Inn at Morro Bay	private	$118.00	100%	98	1

[1] Price was surveyed for the same date, Thursday, June 23, 2016, and acquired using each accommodation's website. Each price reflects the least expensive option available.

[2] The prices for these accommodations were acquired by making phone calls, as they had no online reservation options.

Table 7.3
Visitor-Serving Accommodations Inventory – Campgrounds and Recreational Vehicle Parks (2016)[1]

Name	Type (campground, RV park)	Location/Address	Owner	Public/ Private	Lowest Cost per night	Percentage of state median price	Capacity
Bay Pines Travel Trailer Park	RV Park	1501 Quintana Rd, Morro Bay, CA 93442	Bay Pines	private	$40.00	34%	112
Cypress Morro Bay RV & Mobile Home Park	RV Park	1121 Main Street, Morro Bay, CA 93442	Cypress	private	$46.00	39%	36
Morro Bay State Park Campground	RV and/or Tent Camping	60 State Park Road, Morro Bay, CA 93332	CA State Parks	public	$35.00	30%	122
Morro Dunes RV Park	RV and/or Tent Camping	1700 Embarcadero, Morro Bay, CA 93442	Morro Dunes	private	$29.97	25%	170
Morro Strand State Park campground	RV and/or Tent Camping	Hwy 1 & Yerba Buena, Morro Bay, CA 93442	CA State Parks	public	$35.00	30%	76

[1] *Price was surveyed for the same date, Thursday, June 23, 2016, and acquired using each accommodation's website. Each price reflects the* ***least expensive*** *option available.*

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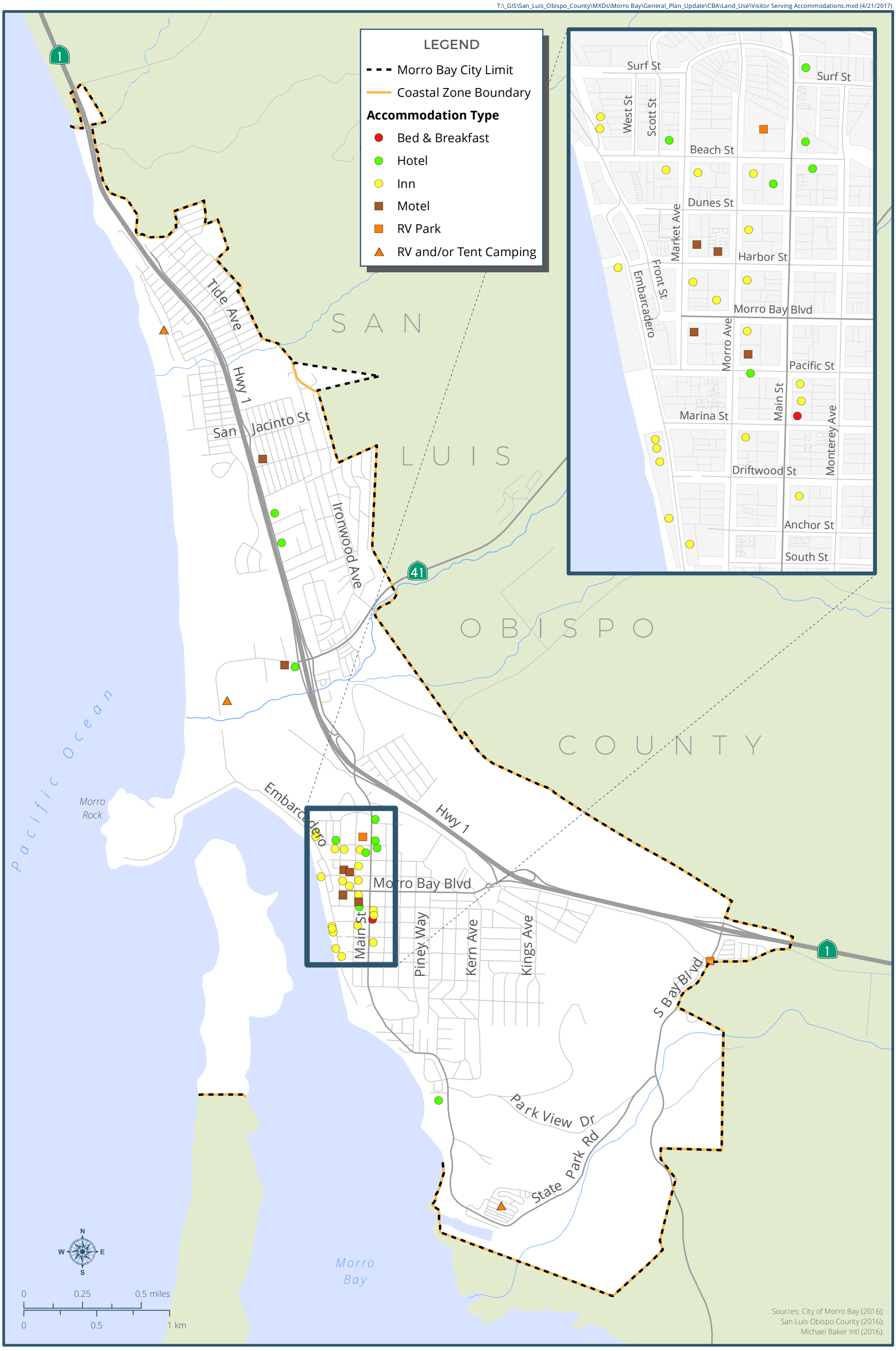

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FIGURE 7.6

Existing Visitor-Serving Accommodations

Page 2

Short-term Rentals

An emerging trend in coastal communities and other popular locations in California is the propagation of private, short-term vacation rentals. Owners of private homes and apartments advertise primarily on the internet using commonly used websites. Local agencies are catching up to this phenomenon, enacting rules and ordinances that regulate or prohibit such commercial activities in residential areas. While these rental units do not contribute to TOT in Morro Bay, they are an important component of the City's stock of overnight accommodations and do pay business license fees.

Michael Baker International evaluated short-term rental accommodation options in Morro Bay in March 2016 to understand how they contribute to the number of overnight accommodations in the city (Table 7.4). This short-term rental survey gathered data using a point-in-time approach for advance reservations for June 23, 2016. However, this survey was different from the other accommodations listed, as only a sample of the overall number of short-term rentals available was surveyed, not the complete list of available accommodations. Short-term rental accommodations ranging from private bedrooms in shared homes to private 1-bedroom, 2-bedroom, 3-bedroom, and 4+ bedroom homes were selected and priced from two websites, Airbnb and HomeAway. Prices ranged from $83 to $670 per night, depending on the size and location of the accommodation.

When comparing the nightly rates for short-term rentals to the state median cost, it is evident that most average nightly rates exceed the "low-cost" threshold of $118.07 per night. The only short-term rentals that may fall below this threshold are certain listings for private rooms in shared homes; the lowest cost surveyed for this type of listing was $83 per night. The lowest prices surveyed for every other type of listing were over 140 percent above the state median price, when surveyed on a per-unit basis. However, the low-cost threshold of $118.07 refers to single hotel rooms, the equivalent of one bedroom. When the price of short-term rental units with multiple rooms is compared on a per-room basis to the state median cost for a hotel room, short-term rentals with at least two bedrooms are less expensive than a median hotel room.

Therefore, while single-bedroom short-term rentals are more expensive than the state median cost for a hotel room, multiple-bedroom short-term rentals are less expensive than hotel rooms on a per-room basis, although the total cost of the rental remains more expensive.

Table 7.4
Visitor-Serving Accommodations Inventory – Survey of Short-Term Rentals (2016)

Type	Number of units surveyed	Low Price	Highest Price	Average	Average per room	Percentage of state median price
Shared Room	None available in Morro Bay					
Private Room	3	$83.00	$170.00	$120.33	$120.33	102%
Entire House						
Studio	None available in Morro Bay					
1 bedroom	3	$159.00	$179.00	$166.00	$166.00	141%
2 bedroom	2	$130.00	$225.00	$177.50	$88.75	75%
3 bedroom	3	$190.00	$268.00	$228.67	$76.22	65%
4+ bedroom	3	$268.00	$671.00	$406.00	$101.50	86%
Total Units Surveyed	14					

Sources: Airbnb.com 2016; Homeaway.com 2016

Commercial Fishing, Recreational Boating, and Infrastructure

Commercial Fishing

Morro Bay's commercial fishing industry is a small but vital part of the city's economy. Commercial fishing was a priority for Morro Bay beginning with the building of the harbor during World War II by the Department of the Navy. The industry thrived and grew for decades afterwards (Endersby 2016; City of Morro Bay 1988). However, between the mid-1980s and mid-2000s, a sharp decline in commercial fishing landings took place. In addition, regulations have been adopted in recent decades by the federal government that limit how and where commercial fishing can occur. In the mid-2000s, the catch share quota system was instituted, which has resulted in a more sustainable fishery both in Morro Bay and in other West Coast ports (NOAA 2015). Part of the shift has been away from a mostly trawl fleet to a more varied fleet of smaller vessels with different catch methods. Landings and revenue hit their lowest point in 2007 and have increased every year since, through 2014 (City of Morro Bay 2015b).

As of 2015, the most economically important fish species in Morro Bay were sablefish, Dungeness crab, market squid, hagfishes, and shortspine thornyhead. These species

made up 84 percent of the landings in 2014 (City of Morro Bay 2015b). In addition, species that have not been plentiful in quite some time have been a greater part of the catch in recent years including lingcod and pink shrimp (City of Morro Bay 2015b and Joseph Conchelos, personal communication, October 2016).

Efforts to support and revitalize Morro Bay's commercial fishing industry have included regular analysis and reports published by the City of Morro Bay, the Morro Bay Commercial Fisherman's Organization (MBCFO), the Nature Conservancy, and other partners. Key publications and organizations supporting a viable commercial fishery in Morro Bay are listed below:

- Commercial Fisheries Business Plan (City of Morro Bay 2008)
- Annual Morro Bay Commercial Fisheries Economic Impact Reports (2011, 2012, 2013, 2014, 2015)
- Morro Bay Commercial Fisherman's Organization (MBCFO)
- Central Coast Women for Fisheries (CCWF)
- Community-based Fishing Association (CBFA)
- The Nature Conservancy
- Morro Bay Community Quota Fund (MBCQF)

Commercial Fishing Infrastructure

Morro Bay's commercial fishing infrastructure has declined since the mid-1990s when the industry as a whole began to decline. In particular, there has been a loss of process facilities. The only fish processing facility in Morro Bay currently is at Tognazzini's Dockside Too on the north Embarcadero. Steady improvements to existing facilities and infrastructure continue to be made. Some notable improvements in recent years include new steel hoists at Dockside Too and DeGarimore's, and investments in trucks and storage equipment at offloading facilities (City of Morro Bay 2014a). The following commercial fishing infrastructure is located in Morro Bay:

- Offloading facilities
  - City Wharf (tenants: Central Coast Seafood/Santa Monica Seafood)

  - Ocean Star (715 Embarcadero). Bait is sold at this facility.
  - DeGarimore's Central Coast Marin Fuel and Ice (1099 Embarcadero). Bait, fuel, gasoline, and ice is sold at this facility.
  - Tognazzini's Dockside Too
- Ice facility on north Embarcadero near Dockside Too
- Two freezer facilities
- Docks, piers, and tie-ups. All of the docks and piers specifically for commercial fishing vessels are located along the north Embarcadero. There are 50 slips owned by the Harbor Department that are designated for commercial fishing.
- Commercial fishermen's dry storage and gear repair facility (1620 Embarcadero)

Figure 7.7 and associated Table 7.5 provide a map and list of commercial fishing and recreational boating related infrastructure, businesses, and services in Morro Bay.

Recreational Boating

Recreational boating is an important feature of tourism and the community character of Morro Bay. Several kayak and stand-up paddleboard businesses are located in the city, as well as businesses offering glass-bottom boat tours, dinner cruises, whale watching, and fishing. The Harbor Department manages slips and moorings that are available for rent to noncommercial vessels (Endersby 2016).

Figure 7.7 and Table 7.5 describe and identify the locations of commercial fishing and recreational boating related infrastructure, businesses, and services in Morro Bay.

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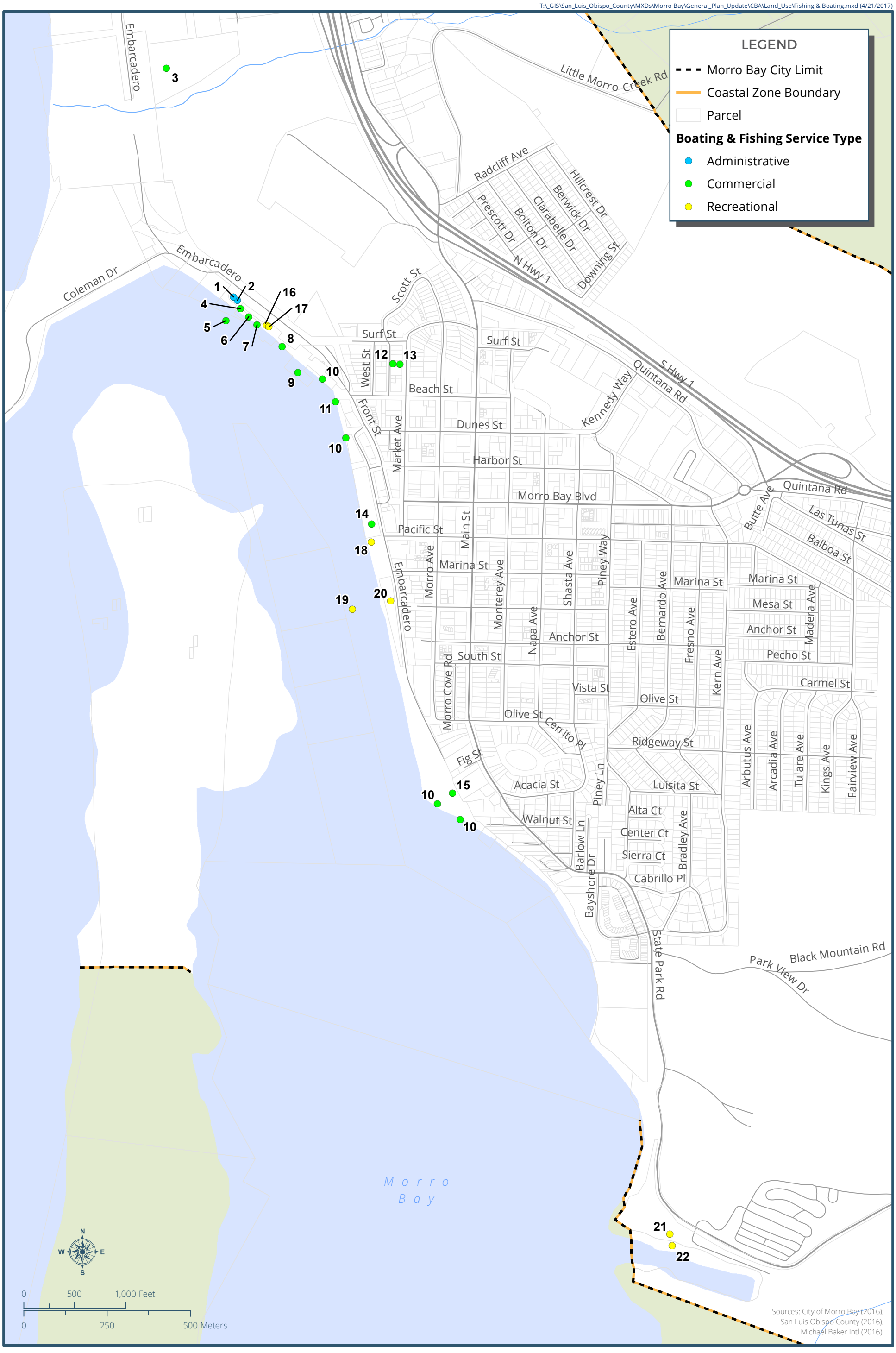

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FIGURE 7.7

Fishing and Boating Related Services

Page 2

Table 7.5
Commercial Fishing and Recreational Boating-Related Infrastructure, Businesses, and Services (2016)

Map ID	Type	Description
1	Administrative	U.S. Coast Guard
2	Administrative	Harbor Department
3	Commercial	Commercial Fishermen's Dry Storage & Gear Repair Facility
4	Commercial	Dockside Too
5	Commercial	North T-Pier
6	Commercial	Municipal Wharf
7	Commercial	Ice Machine & Delivery Chute
8	Commercial	Virg's Landing (dock)
9	Commercial	South T-Pier
10	Commercial	Slips Designated For Commercial Fishing (50)
11	Commercial	DeGarimore's Central Coast Marine Fuel & Ice
12	Commercial	Jerry's Marine & Tackle
13	Commercial	Virg's Landing
14	Commercial	715 Embarcadero facility, Ocean Star
15	Commercial	Boat Launch at Pirate Park
16	Recreational	Central Coast Paddling
17	Recreational	Chablis Cruises
18	Recreational	Sub Sea Tours
19	Recreational	Other boat slips open to noncommercial vessels
20	Recreational	Kayak Horizons
21	Recreational	Kayak Shack
22	Recreational	State Park Marina

Sources: Morro Bay 2014a

Industrial Uses

Desalination Plant

As also described in Chapter 6 (Infrastructure and Public Services), in 1992, the City constructed a seawater desalination plant during a drought emergency. The plant utilizes a sweater reverse osmosis (SWRO) system to desalinate seawater produced from five seawater wells located along the Morro Bay harbor. The California Coastal Commission approved a Local Coastal Program (LCP) Amendment to allow the desalination plant to operate as needed to ensure that minimum water quality standards are met, as routine replacement, and to offset drought conditions in 1995. Due to iron fouling issues, between 1995 and 2002, the desalination plant was not

operated. Limited pilot testing was conducted during June and July 2001 to evaluate potential methods to minimize the impact of the raw water's high iron concentrations.

Currently, the desalination plant is operated to offset seasonal peaking and for routine supply replacement, such as during State Water Project (SWP) outages. In the future, the desalination plant may be utilized more regularly once the iron fouling issues have been resolved. The City's permits for outfall and sea well operation have expired; however, City staff has discussed with the Coastal Commission the possibility for operating the facility under certain emergency conditions. The Public Works Department is currently working on obtaining the appropriate permits.

Agricultural Resources

Agriculture in the Coastal Zone is protected under the Coastal Act. The act mandates that the maximum amount of prime agricultural land be maintained in production and that threats to prime agricultural land be countered by supporting various techniques to promote agricultural productivity. These include "establishing stable urban-rural boundaries, agricultural buffers, development priority on lands not suitable for agriculture, subdivision restrictions, and public service expansion controls" (California Coastal Commission 2013). Agricultural uses inside the planning area are limited; almost all are located on the east side of Highway 1 near the southeast end of the city (see Figure 7.8).

A small amount of prime agricultural land is located just south of Morro Creek and Highway 41 east of Highway 1. The remainder of the agricultural land in Morro Bay is categorized as unique farmland, farmland of local potential, and grazing land. None of the agricultural land in Morro Bay is located outside of the Coastal Zone.

Aquaculture

Oyster farming has a long history in Morro Bay and has made a resurgence in recent years (Morro Bay Oyster Company 2016). The oyster farming estuary occurs primarily at the south end of the bay near the estuary as well as near Tognazzini's along the northern section of the Embarcadero.

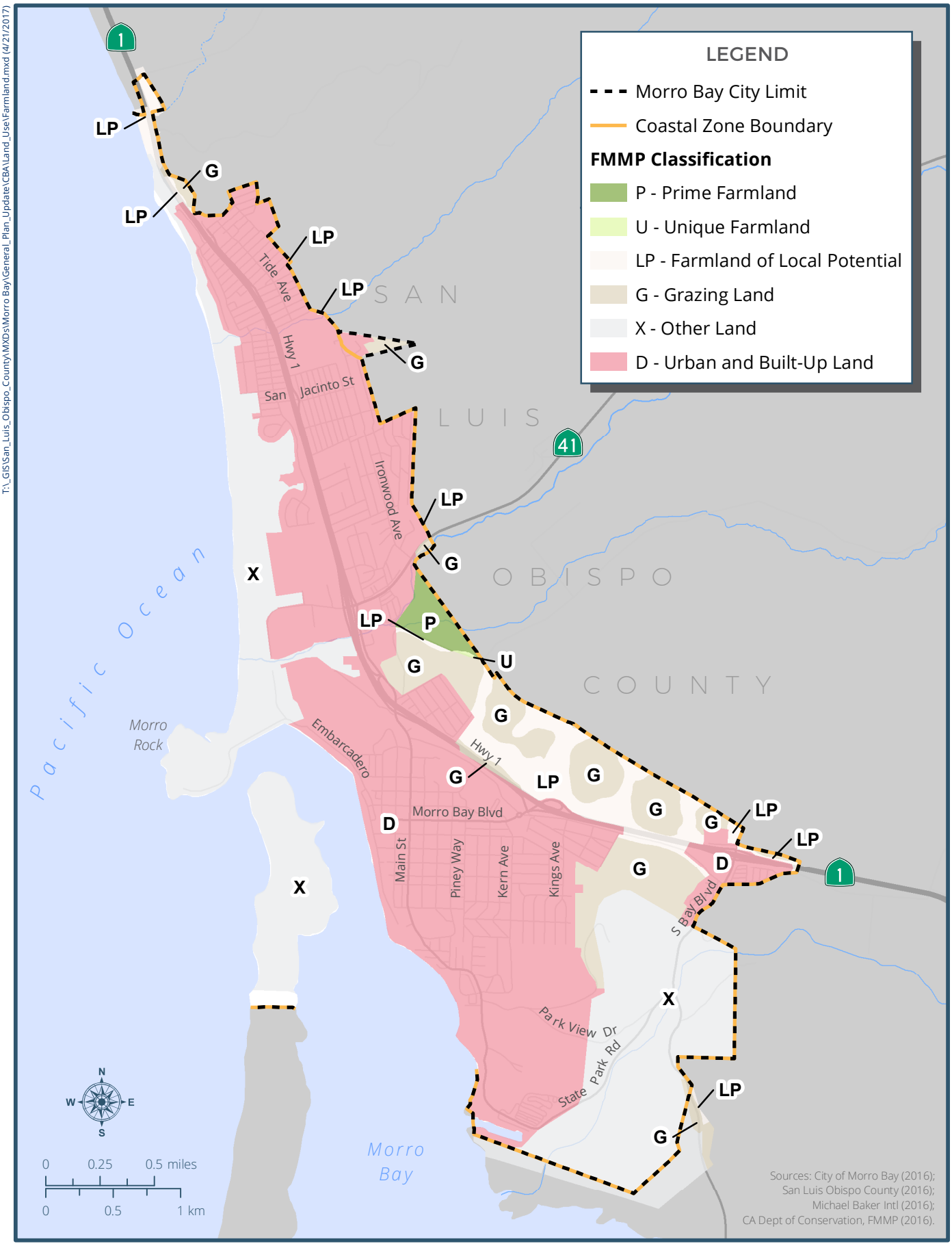

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FIGURE 7.8

Important Farmland

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ENERGY-RELATED USES

Energy-related uses are currently limited in Morro Bay. Until 2014, a power plant was operated just north of the Embarcadero, most recently by Dynegy Corporation (Wilson 2014). Dynegy still owns the plant, and the structures and smokestacks still exist on the site.

Decommissioned Dynegy Power Plant

The power plant facility owned by Dynegy is located on approximately 100 acres north of the Embarcadero near the City's water treatment plant. This site also includes the site of the former intake pumps for the power plant. The natural gas-powered plant was built in the 1950s and operated until 2014. Reasons for the closure included cost of compliance with current environmental regulations and fluctuation in the market for electricity (Pemberton 2013).

COMMUNITY CHARACTER

A community's character can be defined by the distinctive or unique physical features, qualities, or attributes (e.g., hilly, small buildings, wide sidewalks), as well as the social characteristics that are influenced by physical characteristics (e.g., pedestrian-friendly, safe, auto-oriented). Various descriptions on the overall character of Morro Bay include small town, eclectic, welcoming, naturally beautiful.

Community character has been an important topic for the Morro Bay community in recent years, particularly related to residential neighborhood character and the compatibility of new residences with existing neighborhoods. This section provides a setting for community character areas as a basis for policy recommendations for the General Plan update.

Scenic and Visual Resources

Scenic and visual resources in Morro Bay include vistas and views, scenic resources, viewsheds, scenic corridors, sources of light and glare, and the visual character of the city and its various districts.

Scenic Resources

Scenic resources are natural or man-made features such as trees, rock formations, historic buildings, and public art. The State Scenic Highway Program protects scenic resources visible from designated scenic highways, and communities may designate features as scenic resources in general and specific plan documents. Such resources in Morro Bay include the following, many of which were identified in the existing General Plan:

- Morro Rock
- Del Mar Park
- Cloisters Park
- Former Dynegy power plant
- Downtown
- Black Mountain
- Morro Bay Sandspit
- State Museum of Natural History
- Morro Bay salt marsh
- Atascadero Beach tract
- Cloisters neighborhood
- The beach
- Coleman Park
- Embarcadero
- Morro Heights
- Morro Bay Golf Course
- State Boat Marina

Scenic Vistas and Views

A scenic vista provides expansive views of an aesthetically valued landscape that benefits the public. This designation may be officially designated or unofficially defined by a set of criteria. While there are no officially designated scenic vistas in the planning area, a number of views serve the purpose of a scenic vista. The views north toward Morro Rock, south toward Morro Bay Estuary and the sandspit, south toward Los Osos and the Irish Hills, and north toward Cayucos both along the coastline and looking northeast toward the hills are all aesthetic views which warrant protection. A map of these selected views, which is not a complete list of all views in the community, is provided in Figure 7.9. The criteria used for assessing views of Morro Bay include such things as:

- The enhancement of the city's character through the use of building materials and scale of the structures.
- The compatibility with surrounding structures.
- The compatibility with the natural features of the area (i.e., topography).
- The preservation of public views.
- The enhancement and definition of the city's image.
- The uniqueness of the city's image.
- Maintenance of scenic highway conditions.
- Any additional view considerations as requested by regulatory agencies.

Although not within the city limits, the views east of Morro Bay along the Highway 41 corridor and surrounding foothills are also an important scenic vista for the community.

San Luis Obispo County's Estero Area Plan also calls for protection of the scenic vista of the Morros, which are located near and in Morro Bay and include Morro Rock, Black Hill, Cerro Cabrillo, Parker Ridge, and Hollister Peak. Aside from Morro Rock and Black Hill, the Morros are visible from only a small portion of the planning area. Figure 7.10 provides a map of scenic views in the planning area.

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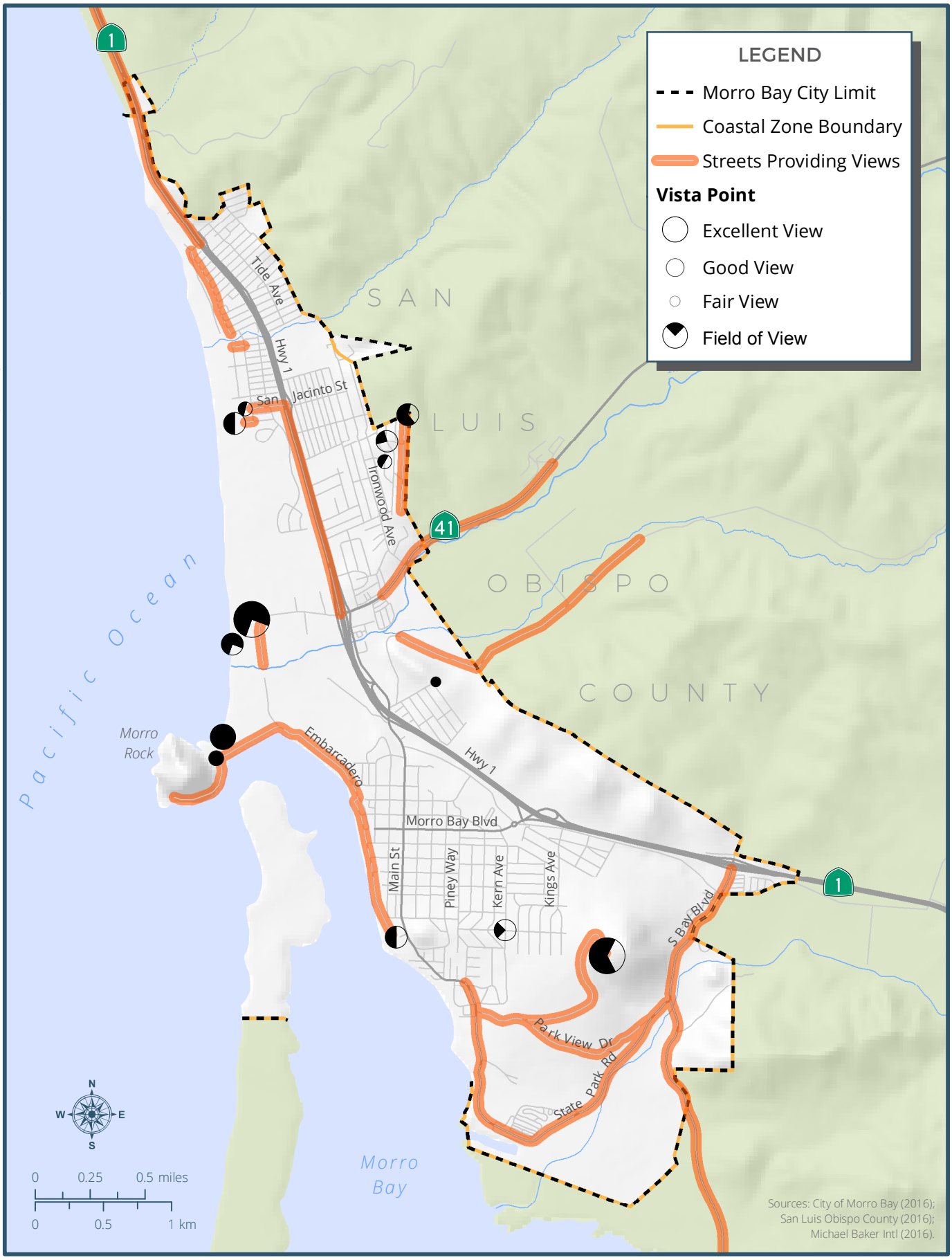

FIGURE 7.9

Viewpoints

Page 2



Plan MORRO BAY

FIGURE 7.10

Scenic Views

Page 2

Scenic Highways and Viewsheds

A highway is designated as an eligible scenic highway when the California Department of Transportation (Caltrans) determines that it qualifies for official status. The status of an officially designated scenic highway changes when the responsible city or county applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated (Caltrans 2016). Scenic highways must have an approved Corridor Protection Program and remain in compliance to maintain scenic highway status.

Highway 1 is an officially designated scenic highway in the planning area. It is also designated as a scenic corridor by the County in the Estero Area Plan (San Luis Obispo County Board of Supervisors 1998). There may be a need to improve the viewshed conditions in parts of these existing scenic corridors. State Route 41 between Highway 1 and US 101 is eligible for scenic highway designation, but has not been officially designated.

Light and Glare

Light and glare from indoor or outdoor uses can reduce visibility of the night sky, create potential hazards to drivers, and be a nuisance to residential areas. The planning area has typical light conditions found in suburban areas (e.g., roadway lighting, commercial parking lot and building lighting, residential buildings, headlights from motor vehicles). Sources of daytime glare include direct beam sunlight and reflections from windows, architectural coatings, glass, and other shiny reflective surfaces. Nighttime light illumination and associated glare can be divided into stationary and mobile sources. Stationary sources of nighttime light include structure illumination, decorative landscape lighting, lighted signs, and streetlights. The primary source of mobile nighttime light is motor vehicle headlights, particularly from Highway 1 and other high traffic streets. Potential sources of light and glare in residential areas include street lighting along major roads, highways, and in large parking lots. In commercial and industrial areas, large parking lots, lit signage, and strip mall development can cause light pollution. Nighttime lighting at Morro Bay High School in the northern portion of the city can also create light and glare concerns. Nighttime glare issues are particularly important for light sources on elevated ground, as the light can be visible from a greater distance and thus affect a larger section of the community.

Community and Visual Character

This section describes the existing character of the community by neighborhood or corridor (as defined in Figure 7.11). The character-defining features of Morro Bay vary by area of the city and generally include density, building height, building bulk, the location of buildings on a lot, lot size (Figure 7.12), architectural style, exterior colors and materials, similarities and differences between neighboring structures, and the year in which the structure was built. Changes to these characteristics, including the trend of significantly expanding existing homes or demolishing older homes to build larger newer ones (a process known as "mansionization"), can substantially alter the nature of a neighborhood. Quantitative and qualitative descriptions of these features are included in the descriptions of the community character areas in this section.

Morro Bay's distinct culture is cherished by locals and tourists alike. Aspects contributing to the overall community and visual character of the city include housing type, appearance, and age; vegetation; public art; and parks and open spaces. Housing stock in Morro Bay was mostly built prior to 1970, with approximately 20 to 25 percent in need of rehabilitation (City of Morro Bay 2014). Both naturally occurring and landscaped vegetation tends to be native and drought-tolerant, with a significant number of large trees.

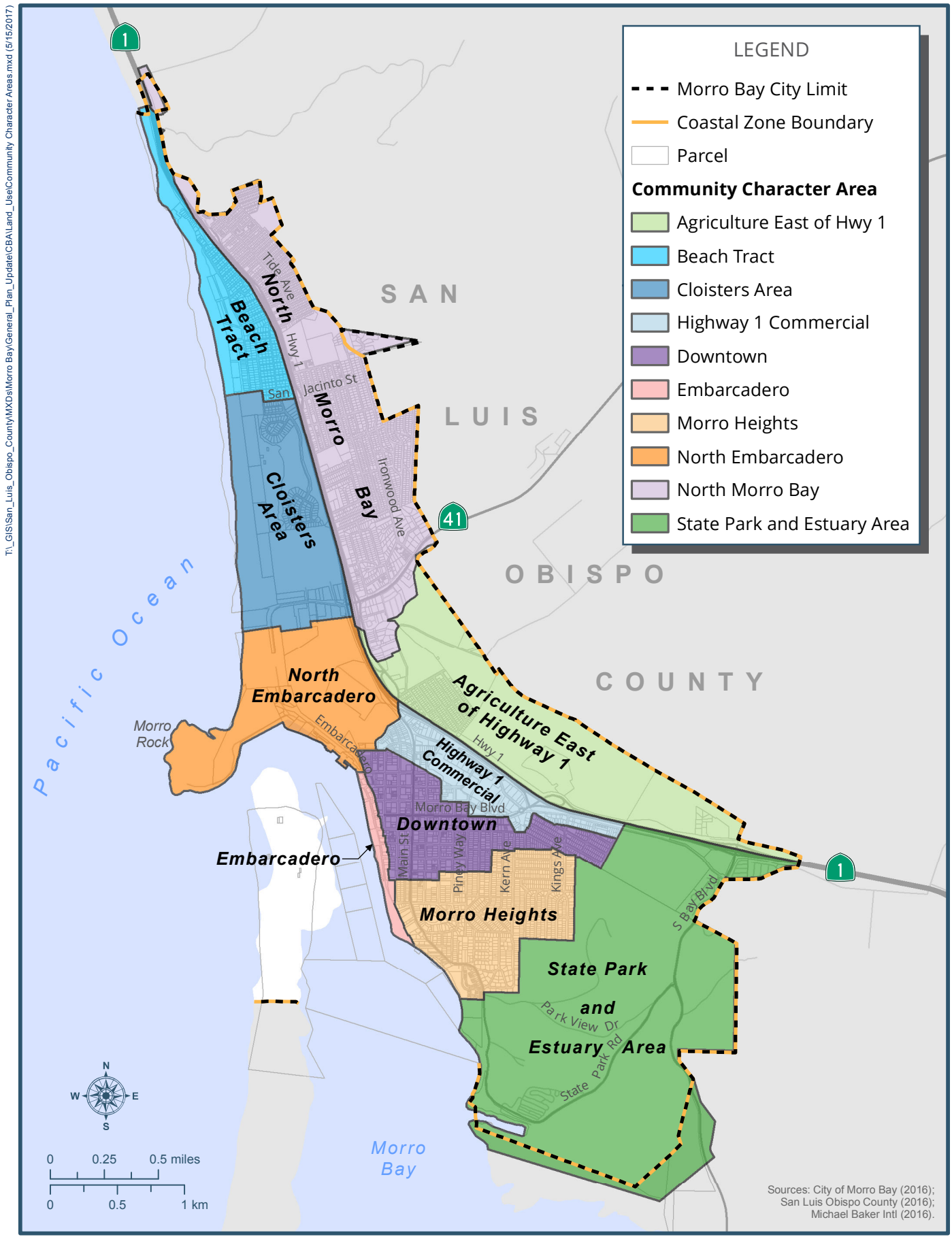

FIGURE 7.11

Community Character Areas

Page 2

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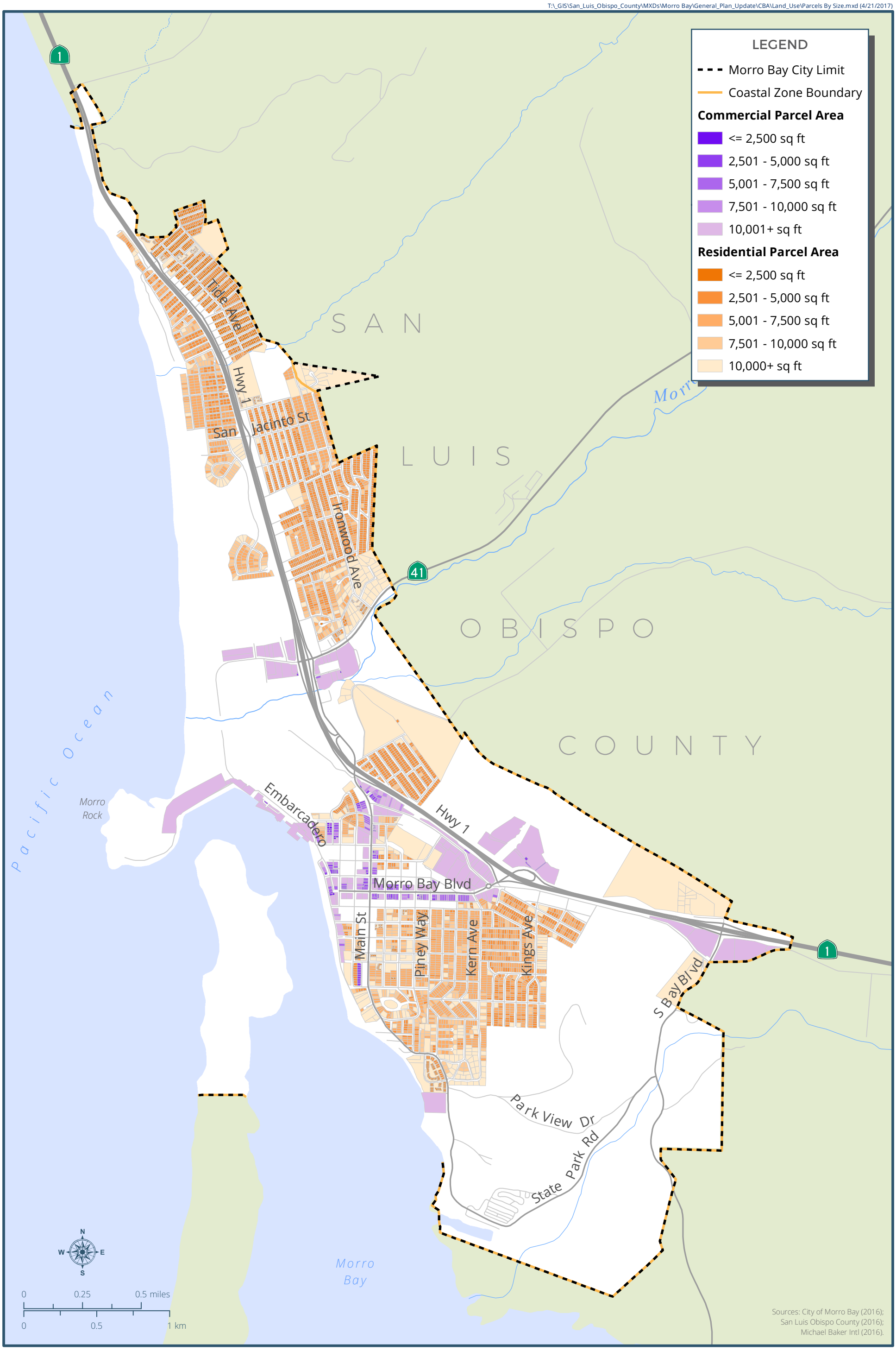


FIGURE 7.12

Commercial and Residential Parcel Size

Page 2

North Morro Bay



The North Morro Bay character area spans much of the length of the city on the east side of Highway 1. Highway 1 is a two-lane divided highway in this stretch of Morro Bay with a speed limit of 55 miles per hour. Nearly all of North Morro Bay is residential. A commercial strip along Main Street (frontage road on the east side of Highway 1) includes retail uses (restaurants, bars, gas stations, and a supermarket) and office uses.

The area slopes gradually, then more steeply, away from the highway. The homes at the eastern edge of this area are located on relatively steep hills and have views of the ocean and Morro Rock.

The majority of buildings are one- or two-story wood-frame single-family residential homes. Most residential parcels range from less than 2,500 square feet up to 7,500 square feet. North Morro Bay has generally newer homes than Downtown and Morro Heights. In the commercial area, the predominant development trend is strip commercial, and commercial development is located on the block on the east side of Main Street.

Beach Tract

The Beach Tract character area is located on the west side of Highway 1 west of North Morro Bay and north of the Cloisters. Morro Strand campground (State Park) is also located in this area west of the highway along the beach. The area west of the highway is nearly flat with limited vegetation. Some large eucalyptus trees are located near the intersection of Highway 1 and San Jacinto Street. Alva Paul Creek runs east to west through this area and North Point Natural Area is located just north of this neighborhood. The area consists of single-family residential development and offers abundant beach access. This neighborhood is also adjacent to the divided 55-mile-per-hour stretch of Highway 1. Houses are typically one-story, suburban-style single-family homes with landscaped yards. Most residential parcels in the Beach Tract area are between 2,500 square feet and 7,500 square feet in size.





Cloisters

The Cloisters character area is located on the west side of Highway 1 south of the Beach Tract. It is one of the most recently developed areas in the city and consists of mostly single-family residential development, natural habitat, Morro Bay High School, and Cloisters Community Park, which includes trails and a wetland area. The homes in the neighborhood are clustered to protect the sensitive dune habitat in the area. The area is generally flat and offers abundant beach access. This neighborhood is also adjacent to the divided 55-mile-per-hour stretch of Highway 1. Houses are typically one-story, larger suburban-style single-family homes of neutral color with landscaped yards, mostly featuring native and drought-resistant vegetation. Most residential parcels in the Cloisters area are between 5,000 square feet and 7,500 square feet in size.

Morro Bay High School and two RV parks are located south of the Cloisters neighborhood on either side of Atascadero Road. Trees have been planted at the school, giving this area a more wooded feel. Two motels are on the south side of Atascadero Road. South of Atascadero Road/SR 41, Highway 1 becomes a limited-access freeway.





North Embarcadero

The North Embarcadero character area includes the North Embarcadero waterfront as well as adjacent industrial areas that include the former Dynegy power plant site, Lila Keiser Park, the City wastewater treatment plant, the commercial fishermen's dry storage and repair facility, and Morro Rock. Morro Creek and the associated riparian corridor run just north of this area. Most commercial parcels in this area are greater than 10,000 square feet in size. Only a few residentially zoned parcels occur in the North Embarcadero area. The area is mostly paved and has minimal vegetation, except along Morro Creek and at Lila Keiser Park. Three prominent smokestacks at the power plant are the visually dominant feature of this area. North Embarcadero offers a clear view of Morro Rock. The City is in the planning stages to identify a new site for a water reclamation facility. That facility will replace the existing wastewater treatment plant once constructed and the existing water treatment plant in this area will be closed. Future uses for the former Dynegy power plant site and the existing water treatment plant site are currently undetermined. Both sites represent key future economic development opportunities for the community.

This area represents the largest concentration of working waterfront uses in Morro Bay. Piers, docks, commercial fishing offloading facilities, and other related commercial fishing infrastructure are located along the waterfront. There are also restaurants and other supporting retail uses. A large City-owned surface parking lot is adjacent to the waterfront businesses. The topography in this area is flat and the only beaches are located north and south of Morro Rock. Morro Rock is accessed via Coleman Drive or a trail positioned just west of the working waterfront area on a relatively narrow strip of land. The area between the waterfront and Morro Rock is undeveloped and is used for recreation; it includes Coleman Park.





The Embarcadero

The Embarcadero is the most iconic character area in the city. The area has a maritime feel, characterized by low-rise one- to two-story buildings and pedestrian-friendly streets. Some of the sidewalks in this area are quite narrow, and the City is currently preparing a widening plan to address this issue. The Embarcadero combines a working waterfront for commercial and recreational purposes with tourist-serving retail. It is adjacent to the ocean and extends east to a bluff that serves as the dividing line between The Embarcadero and Downtown. The area runs from North Embarcadero to the State Park area at the south end of the city. The bayside of Embarcadero is completely developed and includes both old and poorly maintained buildings and some of the city's newest development. A number of underdeveloped properties are located on the land side of The Embarcadero. Buildings on the bayside of the street are designated for coastal-dependent uses including visitor-serving uses (e.g., restaurants, gift shops, attractions, accommodations), commercial fishing, and recreational boating.

The bayside of the Embarcadero provides numerous coastal access points including formal piers, seating areas, and pathways. Some of the parcels offer lateral access along the bay. However, these lateral access paths are typically developed on an ad hoc basis and do not generally synch up with adjacent properties.

Residential development along The Embarcadero is extremely limited. Commercial parcel sizes vary from less than 2,500 square feet to more than 10,000 square feet. The topography is flat and there are no beaches inside the harbor. Vegetation is limited and includes succulents and coastal plant life, with some plants in planters, giving the area a more urban feel.





Downtown

The Downtown character area is uphill from The Embarcadero between the waterfront and the Highway 1 commercial area. This area includes a variety of uses including residential, retail, office, service commercial, and tourist-serving uses. The greatest number of hotels and motels in Morro Bay are in this area. Restaurants and retail uses are concentrated on Morro Bay Boulevard, particularly near its intersection with Main Street.

The largest concentration of two-story buildings in the city is in this area, along with some mixed-use buildings. Approximately 80 percent of the parcels in Downtown are zoned residential, with the majority ranging from 2,500 square feet to 10,000 square feet in size. Typical commercial parcel sizes also vary widely, from less than 2,500 square feet to larger than 10,000 square feet. This area contains the oldest buildings in the city, but also a significant number of newer buildings. There is great variety in the building styles, and most streets have large, prominent trees. The streets are oriented in a traditional grid pattern. Downtown also includes areas that are purely residential, especially on the perimeter. The topography of this area slopes gently uphill toward Highway 1.





Highway 1 Commercial

Most City government buildings and highway commercial development can be found in this character area situated between Downtown and Highway 1. These include City Hall, the Veterans Hall where the City Council meets, and the Community Center. Highway commercial development in this area is mostly strip commercial and includes a grocery store, gas station, and other service commercial uses. The topography in this area is variable with Morro Bay Boulevard serving as the high point. Triangle-shaped City Park is located near the roundabout on Morro Bay Boulevard.

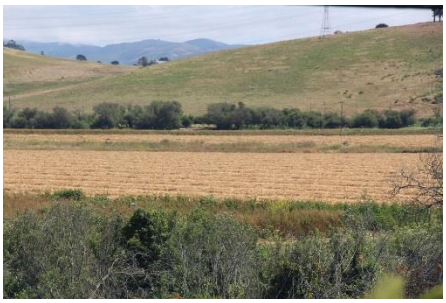
There is little vegetation in this part of the city. The highway commercial uses stretch along the west side of the highway to South Bay Boulevard. The relatively limited number of residential parcels in this area vary in size from less than 2,500 square feet to larger than 10,000 square feet. Commercial parcel sizes vary as well, with a substantial number of parcels larger than 10,000 square feet.





Agriculture East of Highway 1

The character area east of Highway 1 south of North Morro Bay (at Morro Road) is predominantly used or designated for agriculture. The northern portion of the area is primarily used for crop farming; the southern portion of the area is used for grazing and is covered by annual grasses. One residential neighborhood is located adjacent to the highway in this area. The topography slopes uphill east of Highway 1. Buildings in the residential neighborhood are 1-story single-family residential homes, and typical parcel sizes vary from 2,500 square feet to 5,000 square feet. Most of the agricultural land is in large parcels of tens or hundreds of acres.



Morro Heights

The Morro Heights character area is a residential neighborhood located on a hill overlooking the bay near the south end of the city. The majority of buildings are one- or two-story wood-frame single-family residential homes. There are more irregular lots and home design variations in Morro Heights than in other residential areas in the city. Typical residential parcel sizes are between 5,000 square feet and 7,500 square feet. The south end of this neighborhood is planted with tall eucalyptus and cypress trees and includes a very large rock outcropping.





State Park and Estuary Area

The State Park and estuary character area is located at the southernmost end of the city. Morro Bay State Park covers most of this area and includes a golf course, campground, marina, boat launch, hiking trails, and other uses. The Morro Bay Natural History Museum is situated on a rocky outcropping overlooking the bay. The Inn at Morro Bay is located on the water, and Chorro Creek flows along the southern end of this neighborhood. This is the most wooded residential area of Morro Bay. Black Hill, the next Morro in the volcanic chain inland of Morro Rock, is in Morro Bay State Park. Residential development is extremely limited. The area is characterized by large eucalyptus and cypress trees, native habitat and wildlife, and hilly topography. The terrain along the water is relatively flat and this area is surrounded by Morro Bay Estuary.





7.2 REGULATORY SETTING

FEDERAL

There are no federal regulations relating to land use, community form, or coastal uses in Morro Bay.

STATE

California Planning Law and General Plan Guidelines

California planning law requires cities and counties to prepare and adopt a "comprehensive, long-range general plan" to guide development (Government Code Section 65300). To successfully guide long-range development, general plans require a complex set of analyses, comprehensive public outreach and input, and public policy covering a broad range of topics. State law also specifies the content of general plans. Current law requires preparation of the following seven mandated elements:

- land use
- housing
- open space
- safety
- circulation
- conservation
- noise

A general plan must contain development policies, diagrams, and text that describe objectives, principles, standards, and plan proposals. According to the Governor's Office of Planning and Research (OPR) *General Plan Guidelines* (last updated in 2003, currently undergoing a comprehensive update), topics from different elements may be combined, but all must be addressed within the general plan (OPR 2003).

California Coastal Act and California Coastal Commission

The California Coastal Act of 1976 (Coastal Act; Public Resources Code Section 30000) and the California Coastal Commission, the state's coastal protection and planning agency, were established by voter initiative to plan for and regulate new development, and create strong policies to protect public access to and along the shoreline.

The components of the Coastal Act most relevant to land use and development in the Coastal Zone in the planning area include:

- Chapter 3: Coastal Resources Planning and Management Policies – provides goals and objectives associated with California's coastal resources and associated public access, recreation, marine environment, land resources, development, and industrial development.
- Chapter 6: Implementation – establishes the process and procedure for the development and certification of LCPs in the Coastal Zone.
- Chapter 7: Development Controls – creates general provisions and procedures for development within the Coastal Zone to best achieve the goals and objectives identified in Chapter 3.

Ensuring that coastal-dependent uses are afforded locations and resources to succeed is one of the primary goals of the Coastal Act. Section 30255 requires that the City give priority within the Coastal Zone to uses that must be located near the coast to function. Coastal-dependent uses must be accommodated on or near the coast, and coastal-related uses must be accommodated near related coastal-dependent uses.

In addition to coastal-dependent and coastal-related uses, another priority for locations in the Coastal Zone is for visitor-serving uses such as retail, restaurants, and other attractions (Coastal Act Section 30222), and affordable overnight accommodations (Section 30213). Adequate parking, facilities, and accommodations must also be available and affordable to the general public.

The Coastal Act also places a priority on recreational boating harbors and facilities serving the commercial fishing. The Coastal Act calls for these types of facilities to be

protected and upgraded and, as much as possible, proposed recreational boating facilities shall not interfere with the needs of the commercial fishing industry (Section 30234).

The final Coastal Act requirement concerning priority uses in the Coastal Zone addresses the location and sustainable management of energy facilities. This includes both oil drilling activities (Section 30262) and emerging technologies, such as solar arrays and wave energy converters, to provide renewable energy (Section 30253(d)).

Requirements for Local Coastal Programs

To ensure maximum public access to the coast and public recreation areas, the Coastal Act directs each local government lying within the Coastal Zone to prepare an LCP consistent with Section 30501 of the Coastal Act, in consultation with the Coastal Commission and with public participation.

Until an LCP has been adopted by the local jurisdiction and certified compliant with the Coastal Act, the Coastal Commission retains permitting authority within the portion of a local jurisdiction located in the Coastal Zone. Section 30519(a) of the Coastal Act specifies that once an LCP has been developed for a municipality, development review authority is delegated to that local government.

Requirements for Coastal Development Permits

A coastal development permit is required for development in the Coastal Zone that results in changes to the density or intensity of the use of land, changes in water use, and/or impacts to coastal access. The general provisions for coastal development permits are described in Section 30600 of Chapter 7 of the Coastal Act. This requirement is waived for emergency projects that are deemed necessary to protect life or property (although the project applicant is required to obtain a permanent coastal development permit once emergency conditions have passed).

The development permit review process is described in ordinances developed by local governments, pursuant to Section 30519. Additionally, Section 30519(b) specifies that requirements for coastal permits do not apply to development proposed in certain areas. These areas are outlined in Section 30600(a)(2), which states that a permit shall not be required for development on tidelands, submerged lands, or public trust lands,

or for any development for which local permits are not usually required. Development in these areas is instead subject to review by the Coastal Commission. The requirements also do not apply to development by a port or harbor district if the LCP includes specific development plans for the area.

Industrial Development

Section 30260 states that "coastal-dependent industrial facilities" shall be encouraged as long as they are consistent with the values outlined in the Coastal Act, and there is minimization of any adverse impacts.

Requirements for Coastal Energy Facilities

Section 30413 explains that the Coastal Commission and the California Energy Commission (CEC) participate in decisions that are made regarding certain coastal areas that relate to energy resources. Section 30264 further explains that thermal electric generating power plants are permitted, as long as the specific site is deemed appropriate by the CEC.

REGIONAL AND LOCAL

San Luis Obispo Council of Governments (SLOCOG)

Regional Transportation Plan/Sustainable Communities Strategy

The SLOCOG *Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) is the guiding document for the development of the countywide transportation system. The major goals of the RTP/SCS are to enhance quality of life and promote sustainability. The RTP/SCS aims to increase diversity in choices for how residents and visitors travel, as well as accessibility to employment, education, healthcare, and housing in the county. There is an emphasis on livable communities, public transit, and active transportation to promote active and healthy lifestyles. The plan addresses five subregions of the county: North Coast, North County, Central County, South County, and East County. Morro Bay is located in the North Coast subregion.

The RTP/SCS is broken down into chapters that address different aspects of the county's transportation network. These are as follows:

- *Sustainable Communities Strategy (SCS)*, which includes regional greenhouse gas emissions reduction targets, future land use scenarios and outputs, traffic model development, target development areas, and a climate adaptation strategy. SCS strategies relevant to Morro Bay include:
  - Additional transportation facilities to encourage multimodal transportation including bike lanes
  - Safe routes to schools improvements
  - Improvements to Highway 41
  - Maintenance of Highway 1
  - Pavement management
  - Maintenance or relocation of the Morro Bay community transfer center for regional bus service
  - Increasing bus service between Morro Bay and Cayucos and Morro Bay and Los Osos
  - Replacing bus and trolley fleets
  - Increasing transit ridership and hours of operation
  - Extension of the Harborwalk across Morro Creek and other trail improvements
  - Improvements to and added waterfront and harbor facilities
  - Protecting and maintaining safe, multimodal access to Morro Bay Harbor
  - Securing funding for breakwater and pier rehabilitation and maintenance and other access improvements

  - Supporting efforts to ensure that the channel between the Midway Marina and the main channel of Morro Bay remains open, and is maintained in a condition allowing free passage of commercial and recreational boats
  - Supporting efforts to protect and provide additional support facilities for the commercial fishing industry at Morro Bay

- *Maximizing Efficiency*, which outlines transportation challenges, demand management, emerging technologies, and goals, policies, and strategies.
- *Highways, Streets, and Roads*, which outlines regional corridors and their major needs and funding mechanisms.
- *Public Transportation*, which includes goals, policies, and strategies for regional public transit systems.
- *Active Transportation*, which prioritizes bikeway improvements and facility support.
- *Performance Measures*, which outlines goals, objectives, and performance measures for all modes of transit.
- *Financial Element*, which outlines issues, challenges, and strategies for future funding of transportation projects (SLOCOG 2015).

Local Area Formation Commission (LAFCO) Municipal Services Review

Each LAFCO is required to periodically update SOIs for all applicable jurisdictions in the county. LAFCOs use municipal services reviews (MSRs) as the primary tool to make these updates. OPR has prepared guidelines for performing these analyses and organizing the studies. The MSR serves to evaluate public services provided by the City and possible changes to the SOI, and must include written determinations of nine legislative factors in order to update the SOI:

1) Infrastructure needs and deficiencies
2) Growth and population
3) Financing constraints and opportunities

4) Cost avoidance opportunities
5) Opportunities for rate restructuring
6) Opportunities for shared facilities
7) Government structure options
8) Evaluation of management efficiencies
9) Local accountability and governance

The MSR then concludes with final recommendations for changes to the SOI, with a clear description of reasons for the determination.

The City of Morro Bay last updated its SOI in an MSR in October 2007. In the process of preparing the 2007 MSR, the City examined the existing SOI, which was established in 1981. The MSR analyzed the nine legislative factors and examined four study areas, as well as the existing SOI. Some of the major findings were stagnation of population growth and major revenue shortfalls. As a result, the City decided to add only one study area and a very small 6-acre portion of another study area, and decrease the size of its SOI significantly, resulting in a reduction of the SOI from 21,800 acres to approximately 100 acres (SLOLAFCO 2007).

San Luis Obispo County Air Pollution Control District (APD)

Strategic Action Plan

The San Luis Obispo Air Pollution Control District (APCD) Strategic Action Plan 2013-2017 was adopted by the SLOAPCD in 2012. The plan's vision is to ensure that the county retains its high air quality in order to promote healthy living and allow residents and visitors to enjoy the county's many aesthetic features. It includes an assessment of the SLOAPCD's assets and obstacles, future challenges, trends, and resources, and outlines strategic goals and performance measures to achieve these goals. The goals are aimed at achieving and maintaining attainment with national and state standards, as well as upholding local and regional goals for air quality. They include managing air contaminants, addressing public health impacts from land uses that impact air quality,

promoting community awareness and engagement in air quality maintenance, and monitoring and minimizing greenhouse gas emissions and impacts. Each goal includes a statement of its importance and a description of the consequences associated with failing to achieve the goal (SLOAPCD 2012).

City of Morro Bay

EXISTING LAND USE PLANS

The distribution of land use types in the planning area, such as residential, commercial, and open space, is regulated by the City's General Plan, Zoning Ordinance, and LCP.

General Plan

California Government Code Section 65300 describes the scope and authority of local jurisdictions to prepare, adopt, and amend general plans. Communities prepare general plans to guide the long-term physical development of the jurisdiction, and any land within the jurisdiction's SOI. At a minimum, the California Government Code requires general plans to address land use, circulation, housing, noise, conservation, open space, and safety issues.

The existing General Plan was adopted in 1988 and includes the following elements:

- Introduction
- Land Use, Open Space, and Conservation
- Circulation
- Visual Resources and Scenic Highway
- Safety
- Noise
- Housing
- Access and Recreation

The current Land Use, Open Space, and Conservation Elements are combined in the existing General Plan and organized into four major sections. Section A includes the authority and purpose of the Land Use Element. Section B describes existing conditions and issues. Section D (which occurs prior to Section C) describes the land use classifications. The land use map is provided following this section. Section C lists the Land Use Element objectives, policies, and programs, broken down by the categories provided in Section B.

General Plan Land Use Designations

The land use discussion of the general plan is required to describe and identify the general location and extent of uses of land for housing, business, industry, open space, public facilities, and categories for public or private uses of land. Figure 7.2 earlier in this chapter presents the map of the existing General Plan land use designations or allowed land uses. The land use element is also required to establish and define population density and building standards for each district and other territories covered by the plan. Visitor-serving accommodations generally are distributed in many areas of the City but concentrations do occur downtown and along the Embarcadero. The land use designations where accommodations occur include Open Space/Recreation, Medium Density Residential, Medium Density Residential/Neighborhood Commercial, Mixed Use, Visitor-Serving Commercial, Service Commercial, and Commercial, Mixed Uses (Harbor).

The land use portion of the element establishes land use categories to regulate use and density of development. Land uses in the planning area include residential, commercial, industrial, agriculture, environmentally sensitive habitat, harbor/navigational ways, mixed use, open space/recreation, and school. The General Plan also includes overlay designations, which apply along with the designation to further guide development. Overlay designations include Planned Development, Restricted, Park, School, Public/Institutional, and Interim Open Space. In some instances, land use designations may not be consistent with the actual land use of buildings at the site.

Residential

The Morro Bay General Plan includes five residential land use categories based on the following density levels:

- Limited Density: Up to 2 units per acre

- Low Density: Up to 4 units per acre
- Low/Medium Density: 4 to 7 units per acre
- Medium Density: 7 to 15 units per acre
- High Density: 15 to 27 units per acre

The majority of parcels designated for residential use in the General Plan are located in the northern and south-central portions of the planning area.

Commercial

In the General Plan, commercial land use categories are focused along Highway 1 and the Downtown area, and one small additional commercial area is located in the southern coastal area north of Fairbanks Point. Much of the commercial development in Morro Bay is visitor-serving, including hotels and inns, restaurants, and shops. Commercial uses are divided into five categories:

- Neighborhood Commercial: These areas are designated to provide for the daily needs of residents nearby. Uses in this designation include grocery and food stores, laundromats, pharmacies, and household stores.
- District Commercial: District commercial areas serve a regional commercial need such as shopping centers and major goods and services.
- Service Commercial: This designation includes commercial uses that are not compatible with residential neighborhoods, as well as light industrial and manufacturing uses, particularly those related to commercial fishing.
- Visitor Serving: The visitor-serving designation encourages tourist-oriented services and uses at easily accessible and destination locations, particularly along Highway 1.
- Commercial/Recreational Fishing: This category implements Measure D (adopted in June 1981), which protects the tidelands area between Beach Street and Target Rock by limiting development and use permits to fishing activities only.

Industrial

The General Plan provides two industrial categories to differentiate coastal-dependent industry from noncoastal-dependent industry.

- General Industrial: This designation includes light industry uses which are not compatible with residential or most commercial uses.
- Coastal-Dependent Industrial: This designation is specifically for uses which must be located near the coast to function, and are thereby given priority pursuant to the California Coastal Act. Examples include thermal power plants, seawater intake structures, discharge structures, tanker support facilities, and other similar uses.

Mariculture and Marine Research

Areas in this designation are considered suitable for the propagation and rearing of ocean fish and shellfish. Uses allowed in the Mariculture and Marine Research designation are coastal-dependent and include the buildings, tanks, raceways, and pipelines for breeding, hatching, grow-out, and related research and administrative offices and educational facilities.

Golf Course

Uses in the Golf Course designation include golf courses and related facilities such as club houses, pro shops, maintenance buildings, parking areas, and irrigation systems, along with other passive recreational areas.

Harbor/Navigational Ways

Harbor and Navigational Ways refer to areas of the city covered by seawater and include the mouth of the bay to the southern city limits. Uses are restricted to those which must be located on the water in order to function, such as mariculture, boating, fishing, habitat, and visitor-serving uses where public access is enhanced or facilitates coastal-dependent uses.

Open Space/Recreation

The Open Space/Recreation designation includes land which is not defined as environmentally sensitive habitat and is not intended to accommodate intensive recreational activities. Uses in this designation typically include athletic fields, campgrounds, horse stables, and other recreational uses.

Mixed Commercial/Harbor Dependent Uses

A mixture of visitor-serving commercial uses and harbor-dependent land uses are accommodated in this designation. Examples include sport fishing facilities, fish stores, gift shops, and recreational boat docks. Areas along The Embarcadero are designated Commercial/Harbor Dependent, and include restaurants and hotels as major uses.

Environmentally Sensitive Habitat

This designates protection areas which serve as habitat for rare or especially valuable plant or animal life that could be easily disturbed or degraded by human activity. Fishing, clamming, and hiking may be allowed in these areas.

Agriculture

The Agriculture designation provides for the identification and preservation of agricultural land for cultivating crops and raising animals. Lands which fit this designation include those with prime soils, prime agriculture land, land in existing agricultural use, land with agricultural potential, and land under Williamson Act contracts.

Mixed Use Areas

Mixed-use areas apply to certain parts of the city that generally include a mixture of residential, office, commercial, visitor-serving, and recreational lands.

Morro Bay Municipal Code – Title 17 (Zoning)

The City of Morro Bay Municipal Code, and in particular the Zoning Code (Title 17), implements the General Plan, particularly the Land Use Element. While General Plan designations are more generalized in nature, the Zoning Code and zoning districts provide specific controls on land use, density or intensity of development, and development standards to implement the City's General Plan goals and policies. Other parts of the Municipal Code, including Title 15 Harbor and Ocean Regulations, and Title 16 Subdivisions, are also instrumental in carrying out policies and programs in the General Plan.

The City has also prepared supplemental documents including a *Stormwater Management Guidance Manual for Low Impact Development* (LID) (City of Morro Bay 2014), and Green Building Incentive Program guidelines (City of Morro Bay n.d.). These are intended to comply with state water quality requirements, to enhance and protect public welfare and environmental quality, and to ensure that future development is consistent with the City's desire to create a more sustainable community.

Table 7.6 illustrates the relationship between General Plan land use designations and zones as identified in the Municipal Code.

Table 7.6
General Plan Land Use/Zoning Consistency

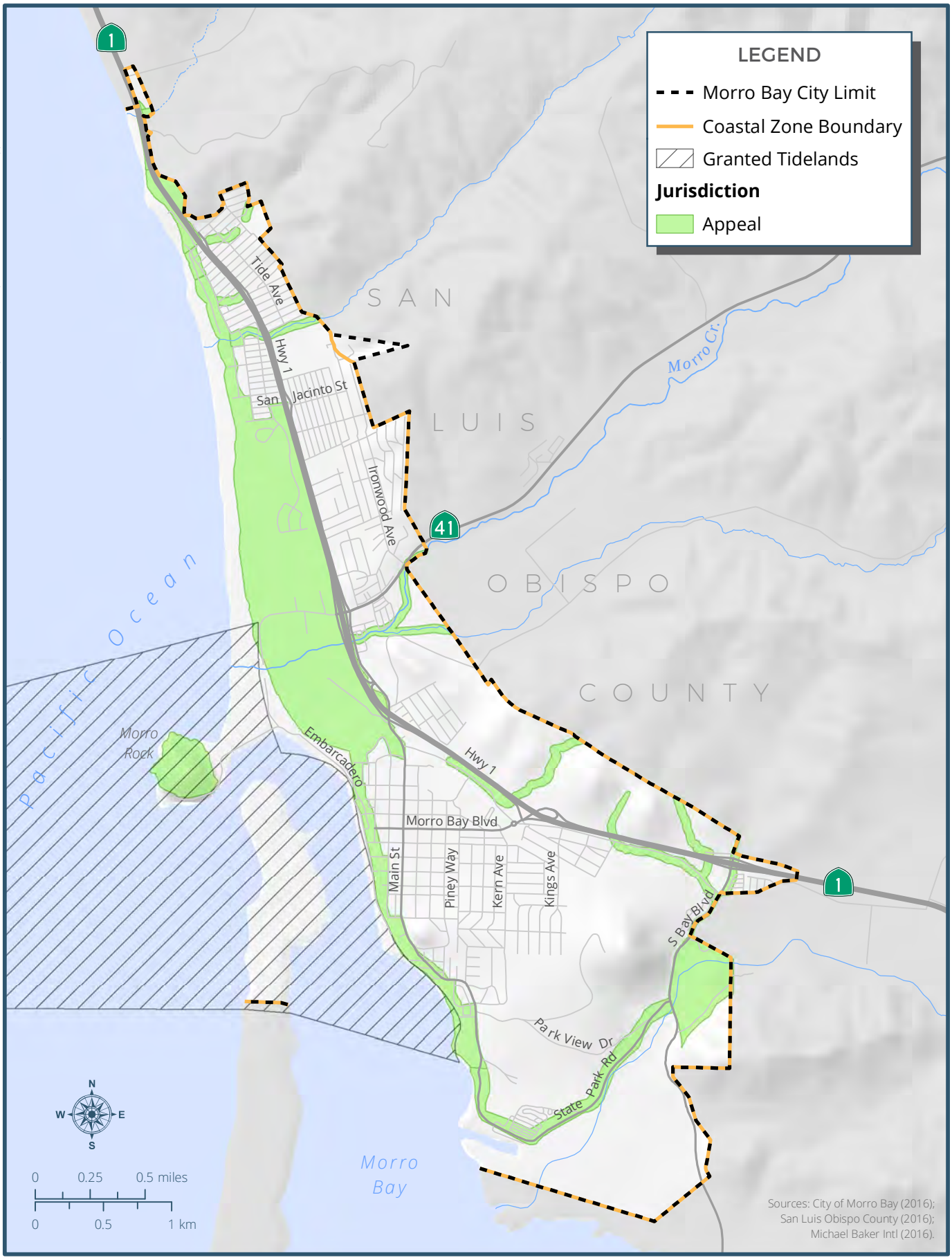
General Plan Designation	Consistent Zone
Residential	
Low Density	R-A, R-1
Low/Medium Density	R-1, R-2
Medium Density	R-1, R-2
High Density	R-3, R-4
Commercial	
Neighborhood	C-2, MCR
District	C-1, C-2
Service	C-2, M-1
Visitor Serving	C-VS
Commercial/Recreational Fishing	CF
Industrial	
General (Light)	M-1
Coastal Development	M-2
Other	
Harbor/Navigational Ways	H
Open Space/Recreation	OA-1, OA-2
Mixed Uses (Harbor)	MCR, H
Mixed Use	MCR
Agriculture	AG
Environmentally Sensitive Habitat	ESH
Limited Density Residential/Golf Course	R-A, GC
Mariculture and Marine Research/Limited Residential/Golf Course	MRR, R-A, GC

Local Coastal Program and Coastal Land Use Plan

The Morro Bay LCP and Coastal Land Use Plan (LUP) was certified on May 20, 1982, and the General Plan was adopted in 1988 (City of Morro Bay 1982; City of Morro Bay 1988). The LCP has since been updated periodically, with a comprehensive update currently occurring in tandem with the General Plan update. These documents govern the coastal zone in the City to implement the California Coastal Act. The major topics addressed in the City of Morro Bay's LUP, pursuant to the Coastal Act, are:

- Shoreline access and recreation
- Archaeology
- Energy (industrial development)
- Commercial fishing
- Environmentally sensitive habitat
- Visual resources and neighborhood character
- Visitor-serving facilities
- Public works
- Agriculture
- Hazards
- Diking, dredging, and filling

Each topics has equal importance in the LUP, and has been considered in the City's development plans.



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Plan MORRO BAY

FIGURE 7.13

Coastal Appeal Jurisdiction and Granted Tidelands

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Within the Coastal Zone, the City is responsible for an area designated "state tidelands trust" (under the jurisdiction of the State Lands Commission). This area is located along The Embarcadero from Fairbanks Point at the south to a pump station at the north, and occurs partially on land and partially in the ocean (Figure 7.13). On land, the designation extends from the shoreline to the centerline of The Embarcadero. These lands are owned by the City and managed by the Harbor Department. The Harbor Department leases these lands to lessees with visitor-serving uses consistent with the Coastal Act (Endersby 2016).

The Coastal Commission has the ability to appeal locally approved development projects in the "coastal appeal jurisdiction." This appeal process ensures that statewide interests in coastal resources are protected and balanced with local interests.

Interim Residential Design Guidelines

In July 2015, the City adopted interim residential design guidelines. The guidelines address the following design issues:

- Scale and mass
- Surface articulation
- Building orientation
- Garage placement and design
- Building materials
- Architectural elements
- Additions to existing homes
- Privacy
- Landscaping

The interim design guidelines were developed to provide objective guidelines for use in reviewing proposed residential projects to achieve consistency with the look and feel of the existing neighborhood (City of Morro Bay 2015a).

Other Applicable City Plans

The City of Morro Bay has adopted several specific and area plans to provide further development guidance for distinctive areas that require more detailed or considerate regulation. Figure 7.14 shows the boundaries of each plan area listed below.

Beach Street Specific Plan

The Beach Street Specific Plan was adopted in 1986. The plan area, which is divided into seven subareas, includes the area north of Beach Street approximately from Front Street to halfway between Morro Street and Main Street. The plan primarily addresses street standards, overlook and bluff top access, and drainage for the area, and includes uses and design standards intended to protect the visual and physical integrity of the bluffs and coast as well as to give priority to visitor-serving and coastal uses. Area F also includes the Cypress Morro Bay RV and Mobile Home Park, which provides for higher densities than are usually permitted in the R-2 zone, subject to pre-existing conditions and a conditional use permit.

North Main Street Management Plan

The North Main Street Management Plan was adopted in 1989. The plan area covers the 2-mile length of properties fronting Main Street in North Morro Bay. It consists of local- and visitor-serving commercial uses at the southern end, and transitions into residential neighborhoods at the northern end. The management plan divides the area into four sections, and allows for a mixed commercial and residential (MCR) zone. It also limits building height, requires landscaped yard setbacks for commercial development, controls negative effects of commercial businesses on neighboring residential areas, and provides street improvements.

Waterfront Master Plan

Morro Bay adopted the Waterfront Master Plan in 1996. It covers four areas: Morro Rock/Coleman Park, T-Piers/Fisherman's Work Area, Embarcadero Visitor Area, and Tidelands Park. This plan addresses the design of The Embarcadero corridor, public transit, harbor facilities, nature observation and information areas, and access to the waterfront.

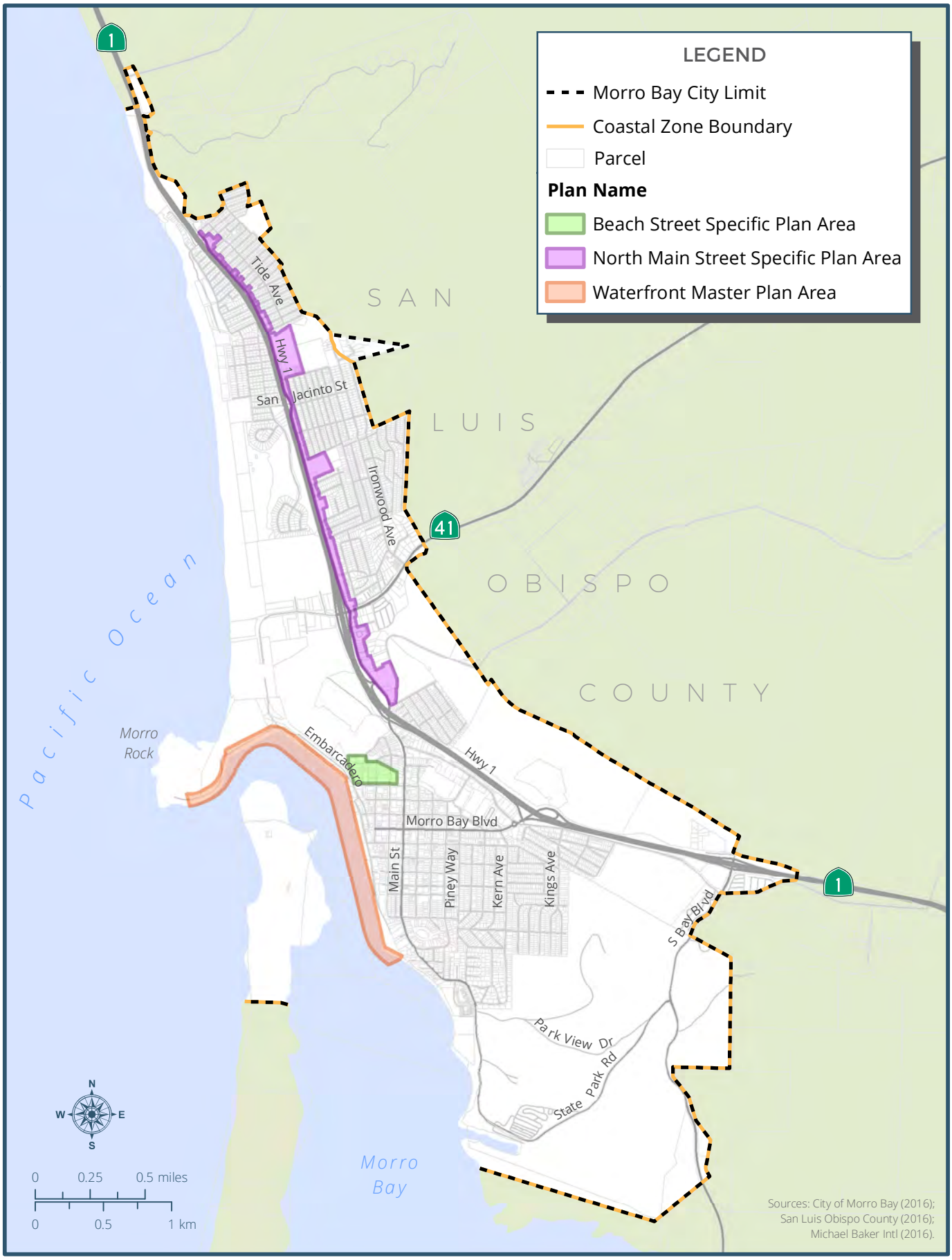

FIGURE 7.14

Plan Areas

Page 2

Morro Bay Ballot Initiatives

Morro Bay voters can adopt ballot initiatives that result in additional land use controls that impact policies in the General Plan, and therefore affect the future direction of City growth. Changes to these land use controls enacted by ballot measures typically require a vote of the people to amend, modify, or repeal the original action. Voters have approved multiple ballot measures, summarized below, that are relevant to future land use planning.

Measure A, 1972 (Ordinance No. 103)

Measure A prohibits construction in the area located between Morro Bay Power Plant and Morro Rock, as well as in the area between Morro Creek and the bay. Any proposed development in these areas requires approval by a majority vote.

Measure B, 1980 (Ordinance No. 197)

Measure B prohibits annexations of land into the City of Morro Bay, unless approved by a majority vote, or unless the annexed land is dedicated to permanent public use.

Measure D, 1981 (Ordinance No. 207)

Measure D restricts development on state-owned tidelands between Beach Street and Target Rock. Only development serving primarily commercial or recreational fishing is permitted.

Measure F, 1984 (Ordinance No. 266)

Measure F establishes a growth management procedure in Morro Bay, intended to facilitate fair distribution of water resources, protect small town character, and preserve existing open space that surrounds the city. The measure established a Water Management Plan that allocates water resources to development each year, thereby limiting both annual and total growth. The ordinance imposes the following standards:

- Limit the annual allocation of building permits by placing a limit of 12,200 on City population. In order to exceed this number, additional water resources must be

made available, and a majority vote of the people in favor of the growth must occur at a regular or special election.[1]

- Determine the appropriate number of building permits to allocate for multi-unit and single-family residential units by January 15 of each calendar year, starting with a baseline 70-unit ceiling, which was imposed in 1985.

- Each year, commercial and industrial building permits shall not require more than 130 percent of water allocated to residential units that year.

- Impose Coastal Act priorities for water allocation as advised by the Coastal Commission, and review periodically.

- Only award building permits to proposals that meet the definition of infill development. Resolution No. 26-84 defines "infill" as "development of vacant existing lots within existing developed areas of the City. An infill area is to be characterized as having supporting public infrastructure (i.e., utilities and secondary thoroughfares or collector street system)." The resolution provides the following standards for identifying a parcel in a developed area:

    - A vacant lot shall be considered to be in a developed area if it is adjacent to existing developed parcels, on at least two sides for rectangular lots or at least 50 percent of the perimeter for irregularly shaped lots. Any property lines coincident with the City limit shall not be considered in this calculation. Any property line adjacent to a park, recreation area, or school shall be considered adjacent to development.

    - Notwithstanding the standards above, any lot that was legally created prior to 1984 and which is 20,000 square feet or less shall be considered infill.

    - So long as an area is currently served by water and sewer mains, utilities shall be considered present for the purposes of this infill definition.

[1] Per Measure F, if the population is projected to exceed 12,200 in the General Plan population projections, no further residential building will be permitted after a population of 12,200 has been reached unless an increase in allowed residential growth has been approved by a majority vote at a regular or special election.

  - When a water management program is approved and implemented and/or additional water sources are available, the criteria for infill will be reconsidered.
  - No subdivision which would require more than 20 percent of the annual water allotment for residential purposes shall be considered infill.

- Only amend Land Use Element Policies 6.01 through 6.08 (and any zoning regulations that implement those policies) aimed at preserving open space and agricultural land within city limits by majority vote of the people at a regular or special election.
- Exempt nonprofit public facilities supported by public funds from limitations within the ordinance (City of Morro Bay 2016).

Measure A, 1986 (Ordinance No. 297)

Measure A is intended to prevent Morro Bay from becoming a base for offshore oil production, such as an oil port or personnel boat center.

Measure D, 1988 (Ordinance No. 341)

Measure D was intended to facilitate the development of the Downtown Albertson's Shopping Center by rezoning the property on Quintana Road.

Measure H, 1990 (Ordinance No. 389)

Measure H limits the zones and uses at the "Tri-W" property, located at the end of Morro Bay Boulevard at Highway 1. It allows commercial uses on only 13 acres of the 30-acre property in question, establishes the location of the commercial uses to be "generally located adjacent to Highway 1 and Morro Bay Boulevard," and prohibits visitor-serving commercial uses on the property.

Measure I, 1990 (Ordinance No. 390)

Measure I decreases water consumption by eliminating allocations from the pipeline program, and restricting allocations made through the off-site retrofit program.

Measure G, 1991 (Ordinance No. 411)

Measure G mandates the city's participation in constructing and supplying water to the Coastal Branch of the State Water Project. It requires a request for a minimum of 1,313 acre feet per year. Although requests to the State Water Project are rarely met in full, this may create a conflict if community members and civic leaders elect to reduce dependence on water from the State Water Project.

7.3 PRIORITY FINDINGS

BUILDING STOCK

Age and Condition of Buildings

A significant number of buildings in Morro Bay were built before 1970, and are therefore beginning to need maintenance and renovation. In addition, Morro Bay has limited land available for future growth, so ensuring that existing buildings are being maintained and used to their full potential is essential. In order to protect Morro Bay's existing community characteristics, it is important to ensure that maintenance and renovation activities of existing buildings are compatible with their neighborhoods. The City can also encourage retrofits to existing buildings, rather than demolishing them and constructing new ones.

Building Size

Many of the vacant residential lots in the city are smaller than 5,000 square feet, making them hard to develop with existing zoning standards. It is important to build upon programs in the Housing Element to ensure small lots are developable and contribute to achieving desired neighborhood character.

VISUAL CHARACTER AND RESOURCES

As change occurs in Morro Bay, there is potential for conflict between existing visual character and resources and new development. This will need to be carefully considered for both CEQA purposes and the continuing culture of the city.

COMMUNITY CHARACTER

Neighborhood Compatibility

The current General Plan endorses preservation of neighborhood character, but lacks specificity as to what criteria are to be used or how such criteria might be applied to achieve this goal. Additionally, community desires about housing size and type and the kinds of development appropriate for the various community character areas may have changed since adoption of the current plan. Gathering, reviewing, and incorporating input about neighborhood and community character will ensure that the updated plans and regulations reflect the vision that Morro Bay residents have for the future living environment of the city. In some areas of the city, land use patterns have also evolved in a manner that appears to be at odds with those envisioned by the current General Plan and Zoning Ordinance. In these areas, special care will be needed to ensure that *Plan Morro Bay* is consistent with current physical, social, and economic realities and with the community's vision in a manner that will avoid inconsistency in the future.

Views

Many scenic views exist in Morro Bay, including those of the estuary, rock, bay, and hills to the north, south, and east of the city. Continued and expanded protection of these views is important to preserving Morro Bay's natural beauty and community character.

COMMERCIAL FISHING

Commercial fishing in Morro Bay continues to steadily recover from the downturn in the industry. Continuing to support economic viability and infrastructure for the city's commercial fishing industry is critical to its sustainability.

LOW-COST VISITOR-SERVING ACCOMMODATIONS

Morro Bay currently has a good selection of low-cost visitor-serving accommodations. High land costs and other economic barriers could impact this supply in the future. The City may want to continue incentivizing and prioritizing low-cost visitor-serving accommodations in the Coastal Zone.

GROWTH MANAGEMENT

Morro Bay has the option of growing the community's population, through annexing new land for development, increasing density on existing land in the community, or a combination of both strategies. However, any population growth exceeding 12,200 people is subject to Measure F (Ordinance 266), which requires that growth beyond that number be approved by a majority vote of the citizens of Morro Bay and that there be demonstrable available water resources to support the increased population. Additional development potential due to changes in land use designations is one possible outcome of *Plan Morro Bay*. Should the community wish to grow beyond the threshold, the limitations in Ordinance 266 will need to be reconsidered.

8.0 Natural and Environmental Hazards

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8.0 NATURAL AND ENVIRONMENTAL HAZARDS

This baseline assessment identifies the natural and human-caused hazards that pose a reasonable threat within the planning area, and may affect residents, visitors, and businesses of the community. It summarizes the nature of the hazards and the current level of risk, any past hazard events, and how the risk of hazards may change under future conditions.

8.1 EXISTING CONDITIONS

SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards include ground shaking, fault rupture, liquefaction, and landslides. Ground shaking and fault rupture are direct consequences of earthquakes, while liquefaction and landslides may be caused either by earthquakes or by other events.

Earthquakes are caused by the movement of large pieces of the Earth's crust, known as tectonic plates. As tectonic plates move against one another they can become stuck together, causing stress to build up between them. Eventually, the stress becomes high enough to overcome the friction between the plates, causing the plates to suddenly slip past each other. The vibrations resulting from this sudden movement is what we perceive as an earthquake.

Earthquakes occur along boundaries called fault lines. Fault lines can be the actual border between two plates, but they may also be borders between two sections of a single plate, created by the repeated process of accumulation and release. California sits on both the Pacific and North American plates. The border between the two is the San Andreas Fault, although other fault lines are present throughout much of the state.

The strength of an earthquake can be measured using either the moment magnitude scale (MMS, denoted as M_w or simply M) or the modified Mercalli intensity scale. The MMS is a replacement for the Richter scale, which is still often referred to but is no longer actively used, as it is not reliable when measuring large earthquakes (USGS 2014a). The

weakest earthquakes measured by the MMS start at 1.0 and the numbers increase with the strength of the earthquake, with the strongest recorded earthquake measuring 9.5 on the MMS (USGS 2015a). The logarithmic nature of the MMS means that the difference in the strength of two earthquakes is much greater than the difference in their measurements would suggest. For example, a 6.0 M_w earthquake is 1,000 times stronger than a 4.0 M_w earthquake, and about 1.4 times as strong as a 5.9 M_w event.

The modified Mercalli intensity scale is not a quantitative measurement; rather, it is based on the damage caused by the earthquake and how it is perceived. The scale ranges from I (instrumental, rarely felt by people) to XII (catastrophic, total damage, distortion of line of sight). Because the Mercalli scale measures earthquakes differently than the MMS, when comparing earthquakes it is possible for one to have a higher M_w, and another to have a higher Mercalli intensity. A general comparison between the two scales is provided in Table 8.1.

Table 8.1
Comparison of Moment Magnitude Scale and Modified Mercalli Intensity Scale

Moment Magnitude Scale	Modified Mercalli Intensity Scale
1.0 to 3.0	I
3.0 to 3.9	II to III
4.0 to 4.9	IV to V
5.0 to 5.9	VI to VII
6.0 to 6.9	VII to IX
7.0 and greater	VIII and greater

Source: USGS 2014b

Ground shaking is generally the most dangerous of seismic and geologic hazards. Shaking can knock over furniture, break windows, and topple trees and utility lines. In stronger earthquakes, the shaking can be strong enough to significantly damage or destroy buildings, sever roadways and pipes, and collapse bridges. Ground shaking is often strongest closest to the site of the earthquake and decreases with distance, although the severity of ground shaking depends in part on local geology, and sites farther from an earthquake may experience more shaking than locations closer to the event.

Fault rupture is the actual movement of the ground surface along a fault line when the plates slip past each other. Depending on the type of fault, the movement may be vertical, horizontal, or both. The damage can be severe, as any building or structure that

straddles the fault is effectively pulled in two directions at once. However, the damage area from fault rupture is generally limited to the area of the fault itself. Some earthquakes can occur without causing fault rupture. Such earthquakes are usually small, but some can be much more substantial, such as the 2003 San Simeon earthquake. These events are known as "blind thrust earthquakes."

Liquefaction occurs when loosely packed sandy or silty soil saturated with water is shaken hard enough for the soil to lose its strength or stiffness, becoming more like a liquid. The soil no longer has the solidness to support buildings and structures and thus anything built on or in the soil (e.g., pipelines) may tilt, collapse, or otherwise be damaged. Soil composition and the height of the groundwater table generally determine liquefaction risk.

Landslides and related events such as rockslides or debris flows occur when the soils comprising a slope become unstable and slide down toward the base. Structures built on or in the moving soil can be damaged, as can any structure in the slide's path. Landslides may occur quickly, or they may unfold over a long period of time. They can be triggered by ground shaking and fault rupture, or by moisture resulting from intense rainfall.

Current Seismic and Geologic Hazard Risks

A number of fault lines capable of causing earthquakes that could potentially have a significant effect on the planning area run near Morro Bay.[1] They are described below and the closest faults (Los Osos, Hosgri, Oceanic-West Huasna, and Rinconada faults) are illustrated in Figure 8.1.

- The Los Osos fault begins about 7 miles offshore from Morro Bay and runs southeast to a point inland from Arroyo Grande. It is a relatively low-risk fault, as scientists estimate that it has a 0.25% to 0.3% chance of causing a 6.7 M_W earthquake or greater within the next 30 years (City of Morro Bay 2006; USGS 2015b).

[1] The probabilities of earthquake events presented here refer only to earthquakes occurring from natural processes. They do not include the possibilities of earthquakes resulting from human activities that involve injecting water or other liquid into the earth, e.g., hydraulic fracturing ("fracking"), which has been linked to earthquake activity (Goebel et al. 2016).

- The Hosgri fault is a lengthy fault that runs mostly offshore from Big Sur south to Point Arguello, although it comes onshore between Ragged Point and San Simeon. It is considered an active fault. Most of the fault has around a 1.15% to 1.3% chance of causing a 6.7 M_w or greater earthquake in the next 30 years, and a 1.0% to 1.2% chance of a 7.0 M_w or greater event over the same time period (City of Morro Bay 2006; USGS 2015b).

- The Oceanic-West Huasna fault begins north of San Simeon and runs southeast along the base of the Santa Lucia Mountains to the Santa Maria River. The risk of this fault causing a 6.7 M_w earthquake or greater in the next 30 years varies from around 0.5% to 0.8% at various points along the fault (USGS 2015b).

- The Rinconada fault runs from west of King City southeast to Santa Margarita Lake. Scientists consider it a potentially active fault, and estimate that it has a 0.35% to 0.4% chance of causing a 6.7 M_w or greater earthquake in the next 30 years (City of Morro Bay 2006; USGS 2015b).

- The East Huasna fault runs from Santa Margarita Lake (at the terminus of the Rinconada Fault) southeast to Zaca Lake in Santa Barbara County. It is considered potentially active and the odds of this fault causing a significant earthquake are quite low, as scientists give it only a 0.06% chance of causing a 6.7 M_w or greater earthquake in the next 30 years (City of Morro Bay 2006; USGS 2015b).

- The La Panza fault runs southeast from Creston to the Santa Maria River. It has a low risk of causing a substantial earthquake, with around a 0.08% to 0.14% chance of resulting in a 6.7 M_w or greater earthquake in the next 30 years, and is considered a potentially active fault (City of Morro Bay 2006; USGS 2015b).

- The San Andreas fault, the most well-known of California's fault lines, runs from Cape Mendocino in Northern California to the Salton Sea southeast of Palm Springs. Part of the fault line runs through eastern San Luis Obispo County in the Carrizo Plain, approximately 40 miles from Morro Bay at its closest point. The size and geologic characteristics of this fault make it one of the highest risk faults in California. The sections in San Luis Obispo County have approximately a 17% to 20% chance of causing a 6.7 M_w or greater earthquake in the next 30 years, and approximately a 6% chance of triggering an 8.0 M_w or greater event in the same time period (USGS 2015b).

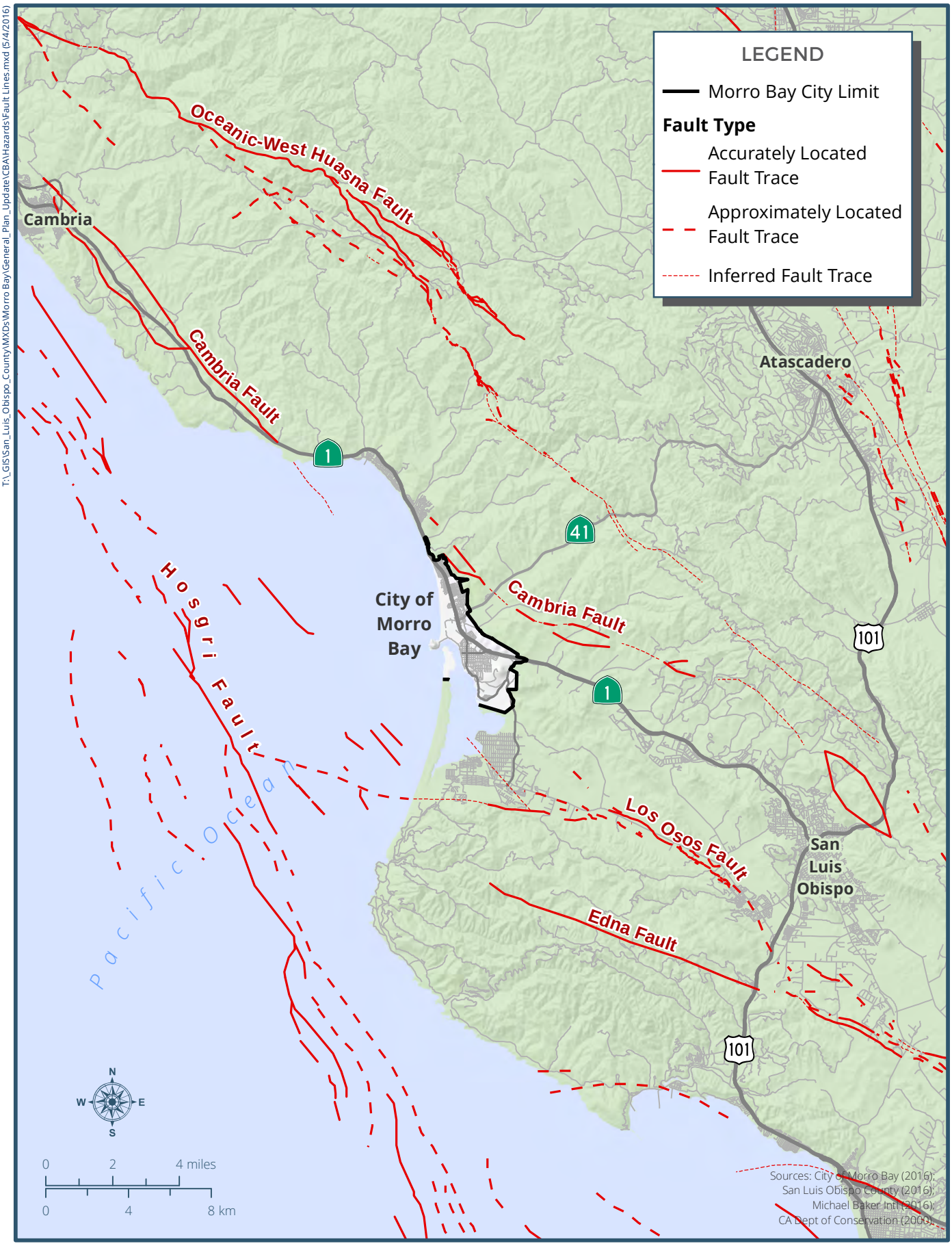

FIGURE 8.1

Regional Fault Lines

Page 2

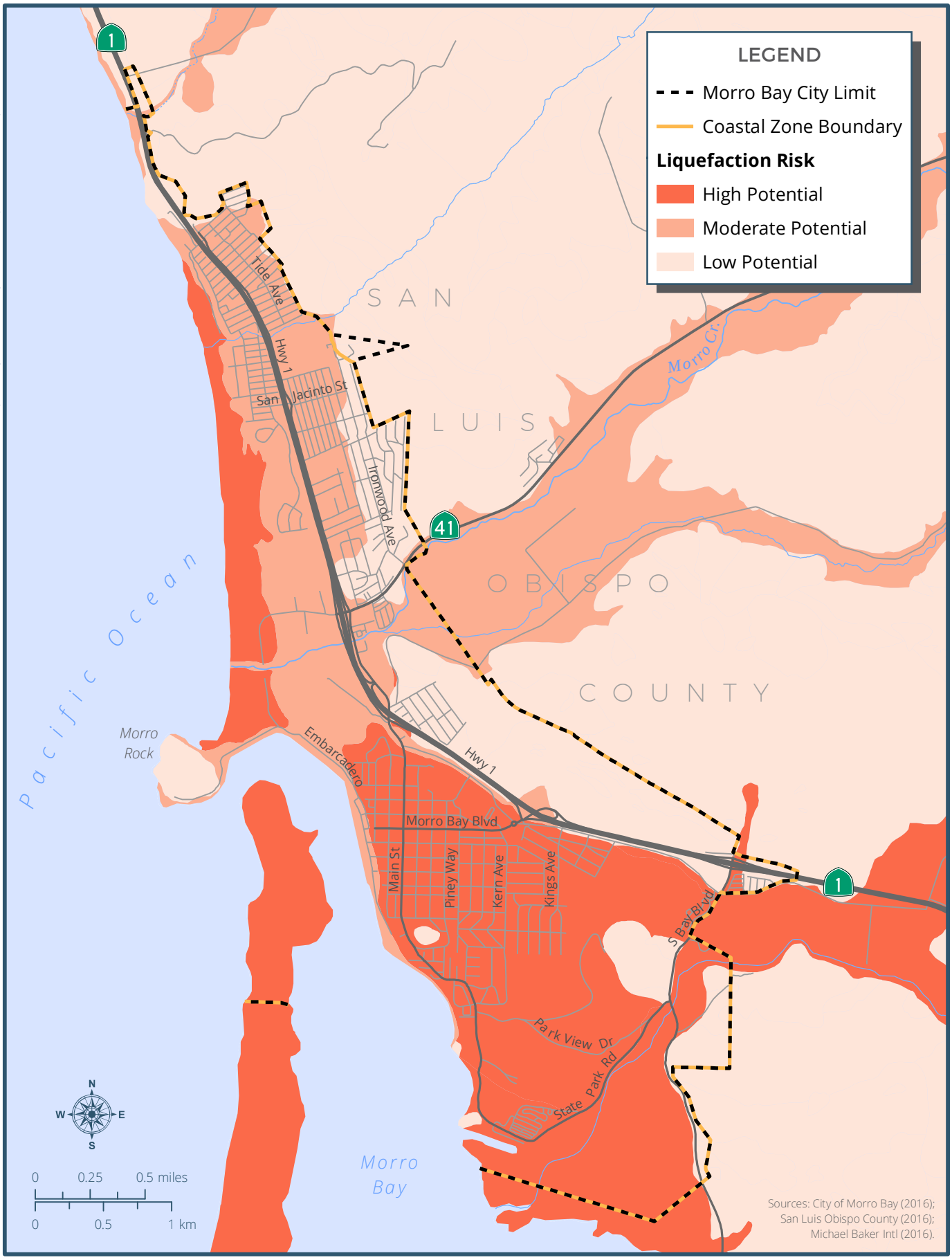

FIGURE 8.2

Liquefaction Susceptibility

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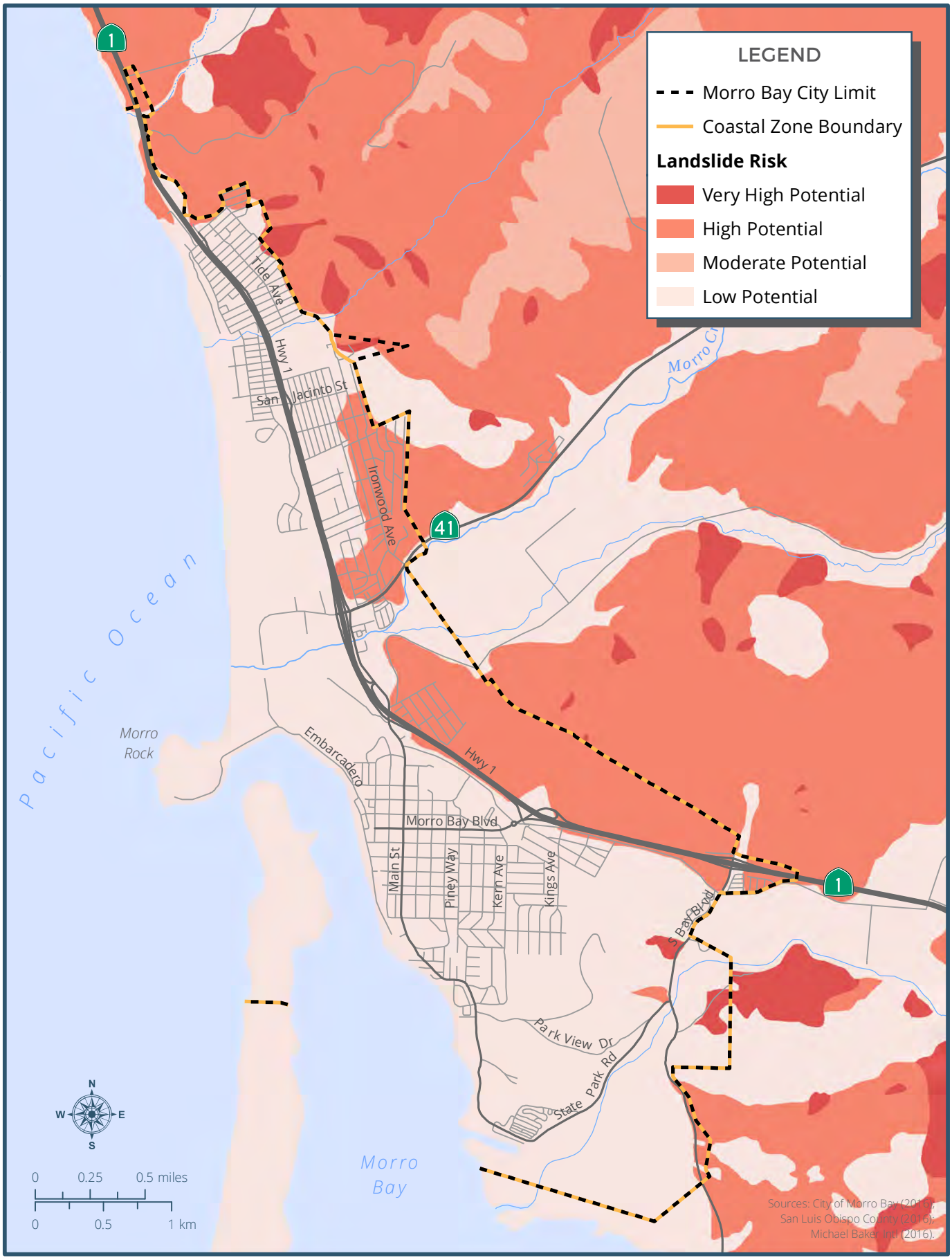

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FIGURE 8.3

Landslide Susceptibility

Page 2

The above is not a complete list of all faults present near Morro Bay; some faults may not be well-studied or not deemed important enough to appear on lists of key area faults. For example, the Cambria fault is not considered likely to produce a substantive earthquake and so it is not listed, although it is still capable of generating earthquakes that could cause damage in Morro Bay. Other faults not included in this list, including faults outside of the Morro Bay region, may be capable of causing substantial earthquakes that may affect the community. Additionally, there may be faults in the area that are yet unknown, but could cause significant ground shaking or fault rupture.

Large parts of Morro Bay sit atop sandy soil, originally either from the beach or deposited as sediment from local creeks. These types of soils have an elevated risk of liquefaction due to their relatively loose, granular structure. This includes parts of the community where the bay has been filled in, such as in places along the Embarcadero (City of Morro Bay 2006). Figure 8.2 shows the liquefaction hazard zones in Morro Bay.

While landslides can occur on most slopes, they are more likely on slopes that are already unstable. In Morro Bay, these landslide-prone slopes are generally located east of Highway 1 and north of State Route (SR) 41 and in some cases include existing residential uses. Landslides along these slopes are particularly frequent in areas with Franciscan Complex geology, which contain numerous varieties of rocks that have been folded into complicated patterns by fault activity (City of Morro Bay 2006). Figure 8.3 shows the landslide hazard zones in Morro Bay.

Historic Seismic and Geologic Hazard Events

The most substantial earthquake to occur in the vicinity of Morro Bay was the San Simeon earthquake, which occurred on December 22, 2003. While the event is usually associated with the Oceanic-West Huasna fault, the earthquake's characteristics were not consistent with the expected behavior of that fault (CISN 2003). The epicenter of the earthquake was about 21 miles northwest of Morro Bay, and was felt as far away as San Francisco and Los Angeles. It measured 6.5 M_w on the MMS and had a Mercalli intensity of VIII (Severe). Most of the damage occurred in Paso Robles, where two people were killed when an unreinforced masonry building collapsed. Morro Bay experienced some building damage and small fires as a result of the earthquake (USGS 2012).

San Luis Obispo County experienced two substantial earthquakes in 1952. The Arvin-Tehachapi earthquake, which occurred on July 21 south of Bakersfield, measured 7.3 M_w on the MMS. It killed 12 people and caused an estimated $60 million in damage (USGS 2014c). It was felt throughout San Luis Obispo County, including in Morro Bay (City of Morro Bay 2006) and caused damage as far away as San Diego and Las Vegas (USGS 2014c). Another earthquake, the Bryson earthquake, occurred in northern San Luis Obispo County. It measured 6.2 M_w on the MMS and had a Mercalli intensity of VI (Strong), and was felt in Morro Bay and other parts of the western county. Smaller earthquakes in the region include the 1830 San Luis Obispo earthquake, measuring an estimated 5.1 M_w, and the 1916 5.1 M_w Avila Beach earthquake. Morro Bay also felt the 1906 San Francisco earthquake, although no damage in the area was reported (City of Morro Bay 2006).

The areas east of Highway 1 and north of SR 41, as previously discussed, are highly prone to landslides. Much of this land is designated as having a high potential for landslides, due to the steep slopes (sometimes 50 percent slopes or more) and presence of Franciscan Complex rocks. Some parts of these areas are designated as very high risk, due to the presence of historical landslide deposits. West of Highway 1, the landslide risk is substantially lower, although there are a few areas of elevated landslide risk around Black Hill and Cerro Carrillo (County of San Luis Obispo 1999).

WILDFIRE

Wildfires are a regular feature of the ecosystem in large parts of California and many of the state's native species have evolved to cope with the natural fire cycle, although increasing development into wildfire-prone areas makes wildfires a hazard of concern. Wildfires that burn exclusively in natural areas generally pose little risk to lives or property, although the smoke from such fires may cause respiratory problems for people nearby. Wildland-urban interface (WUI) fires are much more of a hazard, as they threaten areas located near the border between urban and wild lands. Common causes of wildfires include accidents, sparks from power lines, lightning, and arson. Wildfire risk is dependent on the amount and type of vegetation, weather, and local topography, among other factors. In Morro Bay, chaparral vegetation is considered at highest risk for fire. Foothill woodland, juniper/oak woodland, and north coast scrub vegetation are also at an elevated risk (City of Morro Bay 2006).

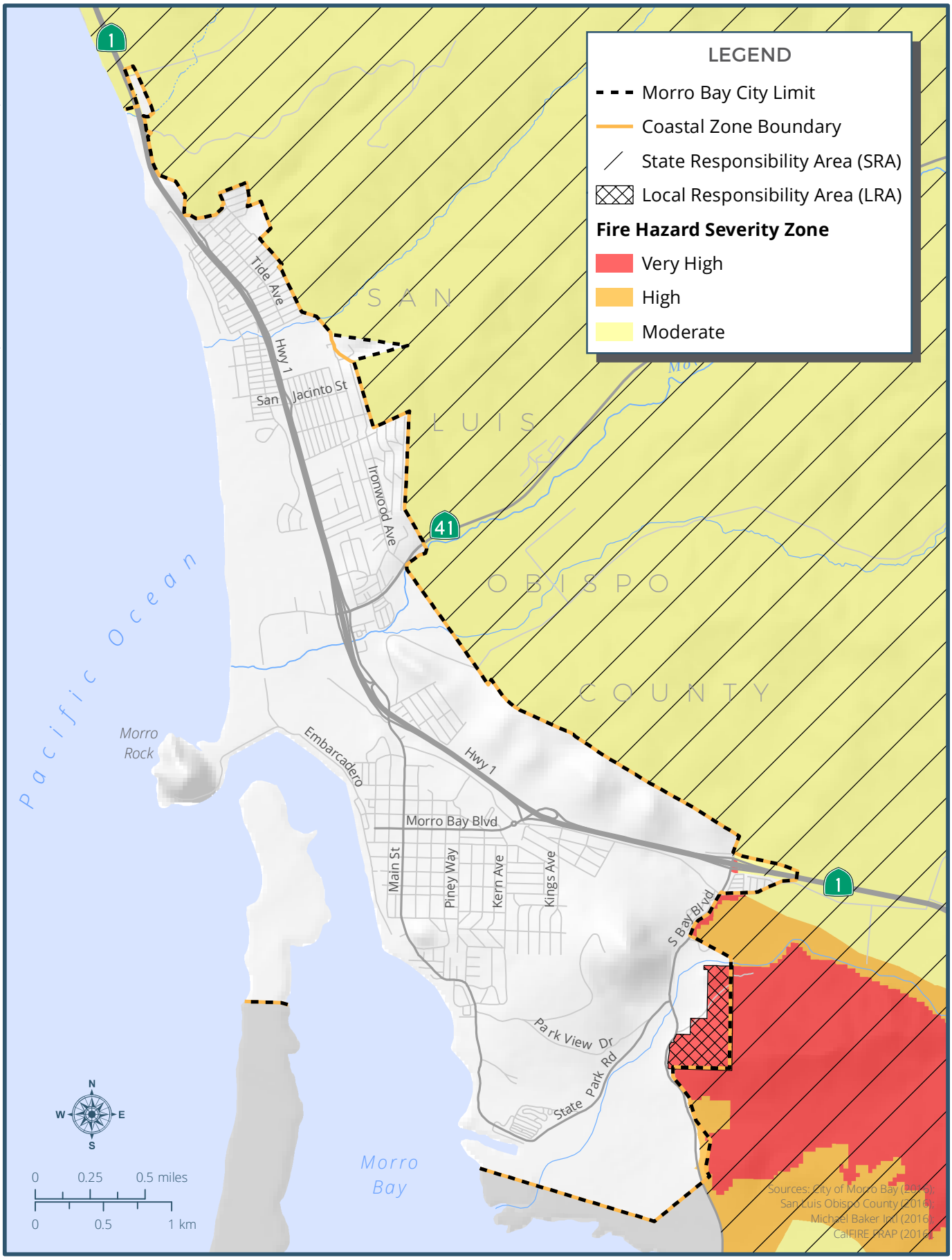

FIGURE 8.4

Fire Hazard Severity Zones and Responsibility Areas

Page 2

The state of California categorizes fire hazard zones (FHZs) as Very High, High, or Moderate. These categories do not necessarily correspond to a specific numeric risk of wildfire frequency or severity, but rather represent a combination of numerous factors. It is possible for significant wildfires to occur in in Moderate FHZs, although such conflagrations are less likely or expected to be somewhat less dangerous.

Current Wildfire Risk

Areas of elevated wildfire risk in Morro Bay lie along the southeastern edge of the community, near Black Hill and Cerro Carrillo. Large parts of this area are designated as a Very High FHZ, and other sections are designated as a High FHZ. All other land in and around Morro Bay is considered a Moderate FHZ, or is not considered at any substantive risk from wildfires. However, areas designated as Moderate FHZ are still susceptible to wildfires to some degree. The proximity of some developments to potential wildfire area and the lack of any wildfire-resistant buffer zone in some areas may increase the wildfire risk in the community. In surrounding areas, there are Very High FHZs along the crest of the Santa Lucia Mountains (approximately 5 miles northeast of Morro Bay) and at Montano de Oro (approximately 6 miles south) (Cal Fire 2007, 2009). Figure 8.4 identifies the FHZs in and adjacent to Morro Bay (note that the State Responsibility Areas identified in Figure 8.4 correspond to areas where the state of California holds primary financial responsibility of preventing and suppressing fires; since Morro Bay is responsible for fire prevention and suppression within its city limits, it is considered a Local Responsibility Area).

Historic Wildfires

Most wildfires in San Luis Obispo County occur in the interior parts of the county, especially the northern and central portions. However, there have been occasional substantial wildfires around Morro Bay. The 1994 Highway 41 fire burned approximately 49,000 acres in the mountains behind Morro Bay, destroying 42 homes and 61 other structures, although Morro Bay itself was not directly threatened (City of Morro Bay 2006).

FLOOD

Floods are events in which normally dry land is partially or completely covered with water. Floods can occur in a number of ways. The water level in a body of water such as a lake or creek can rise higher than the water body's banks, causing it to overflow into nearby areas. Heavy precipitation can also overwhelm the ability of soil to absorb water or storm drains to carry it away, causing water to build up on the surface (ponding). Additionally, flooding may occur as the result of wave run-up. Flooding may also occur from infrastructure failure, such as a burst water tank or pipe. Coastal flooding, which occurs because of exceptionally high tides, storm surges, sea level rise, or some combination of these events, is discussed in the Coastal Hazards section below.

Floods are usually described by their frequency. A 100-year flood is one that has a 1 percent (one in 100) chance of occurring in any given year, while a 500-year flood is one that has a 0.2 percent (one in 500) chance of occurring in an average year. This does not necessarily mean that a 100-year or 500-year flood will only occur once every 100 or 500 years, as it is possible to have multiple such events occur frequently. The severity of flooding that constitutes a 100-year or 500-year flood event may change over time. The area at risk of flooding from these types of events is known as the flood plain.

Current Flood Risk

In Morro Bay, the floods that are of greatest concern occur as a result of heavy precipitation from meteorological phenomena called atmospheric rivers (ARs). These are narrow bands of warm, very moist air that often bring heavy precipitation. ARs are responsible for 30–50 percent of the Pacific coast's precipitation, much of which comes from a relatively small number of events (NOAA 2016a). Flooding can also occur from non-AR storms, although the likelihood of such an event is lower.



FIGURE 8.5

FEMA Flood Zones

Page 2

Flood risk in an area is identified by the Federal Emergency Management Agency (FEMA), which prepares maps identifying the boundaries of flood-prone areas and the severities of potential floods. According to FEMA, the areas of highest flood risk in Morro Bay are coastal areas, a wide swath of land around Morro Creek, and parts of northern Morro Bay around Alva Paul Creek (FEMA 2016). Figure 8.5 shows the flood hazard zones in Morro Bay.

Historic Floods

Multiple past flood events have affected Morro Bay, along with much of the rest of San Luis Obispo County. Intense rainfall in the area usually occurs between December and March; thus, flood events typically occur in this period. A series of storms in January 1969 delivered up to a foot of rain over an eight-day period, and another set of storms in February resulted in another 5 to 10 inches. The Morro Bay sewage treatment plant was inundated, causing a sewage spill that posed a substantial human and environmental health risk. In early 1995, a series of storms driven by a strong El Niño event delivered up to a foot of rain in one 24-hour period. Morro Bay was temporarily isolated when SR 41 was closed by a rockslide, and flooding in San Bernardino and Morro Creek cut off access from the south and north, respectively.

DROUGHT

A drought is a lengthy period of time when precipitation is substantially below normal levels. The lack of water supplies may lead to water use restrictions or increases in water rates, which can be harmful for activities that rely on large volumes of water. Agricultural activities can suffer, particularly crops that rely heavily on irrigation. In developed areas, vegetation such as street trees and property landscaping may become water stressed, increasing the risk of disease or plant death. Drought conditions usually do not create a health or safety risk, although in severe cases communities may not have sufficient water to meet demand.

In addition to creating water shortages, droughts can have secondary impacts. During a drought, soil often hardens and becomes less permeable, which can lead to increased flooding when precipitation returns because the soil cannot absorb water as easily. Drought conditions can increase the amount of dried vegetation in a wildland area, exacerbating the risk of fires.

Unlike many other hazards, droughts are chronic conditions that develop over a long period of time. It typically takes multiple years of lower-than-average precipitation for a drought to be declared, and droughts may last for years. Droughts are considered regional or statewide hazards, and conditions where one or a small number of communities are in drought conditions while their neighbors are not are rare.

Droughts are classified using the US Drought Monitor Classification Scheme, shown in Table 8.2.

Table 8.2
US Drought Monitor Classification Scheme

Category	Description	Possible Impacts
D0	Abnormally dry	Slower growth of crops and pastures compared to normal activities.
D1	Moderate drought	Some damage to crops and pastures. Streams, reservoirs, or wells low. Some water shortages may be developing or imminent.
D2	Severe drought	Likely crop and pasture losses. Water shortages are common, leading to restrictions.
D3	Extreme drought	Major crop and pasture losses. Widespread water shortages.
D4	Exceptional drought	Exceptional and widespread crop and pasture losses. Emergency shortages develop.

Source: US Drought Monitor 2016a

Current Drought Risk

Droughts are an occasional feature of California's climate conditions, and Morro Bay may be affected by them. While many native plant and animal communities have adapted to occasional droughts, nonnative vegetation may suffer during drought conditions. This includes some types of landscaping, lawns, and crop types that require a large amount of water.

Morro Bay receives most of its water from a combination of local groundwater and purchased water from the State Water Project (SWP), with a smaller amount of water coming from the City's desalination plant. Water from desalination is effectively drought-proof, although the desalination plant is used only in a limited capacity due to occasional operational issues (City of Morro Bay 2011). Local groundwater is somewhat resilient to drought conditions, although groundwater supplies may not be fully replenished during drought conditions, and groundwater shortages may occur in extreme situations. Water from the SWP is sourced from the northern Sierra Nevada, which is vulnerable to

drought. In significant drought years, water deliveries from the SWP may be substantially curtailed from normal levels.

Historic Drought Events

Multiple past drought events have affected large swaths of California, including Morro Bay. One drought in 1976 affected most of California and caused approximately $2.7 billion in damage, mostly through agricultural losses. The most severe drought known to have occurred in Morro Bay began in 2012 and has persisted into early 2016. Although rains over the 2015–2016 winter season have somewhat diminished the drought's severity, it continues to have a drastic impact on California. As of June 2016, approximately 21 percent of California, including Morro Bay, was in a state of exceptional drought (the most severe category). Overall, approximately 59 percent of California was in a state of severe drought or higher, and all but 6 percent of California was in some form of drought condition (US Drought Monitor 2016b).

RADIATION AND HAZARDOUS MATERIALS

A hazardous material is defined under the California Health and Safety Code Section 25141 as a substance that causes "an increase in mortality or an increase in serious, irreversible, or incapacitating illness," or poses "a substantial present or potential hazard to human health or the environment … when improperly treated, stored, transported, or disposed of, or otherwise managed." This can include a wide variety of substances, such as flammable or explosive materials, infectious materials such as germs, corrosive substances such as acids, or other dangerous materials such as poisons or radioactive substances. Some materials are always hazardous or potentially hazardous, while others only pose a danger in certain conditions. For example, some flammable materials are inert and relatively harmless unless they are exposed to a heat source or spark.

Hazardous materials are usually contained in specially designed vessels and subject to appropriate protocols regarding how they are handled, stored, transported, used, and disposed of. However, when these materials leak or escape, they can expose people and objects in the vicinity to their harmful effects. Hazardous material releases can occur because of another emergency, such as an earthquake or flood, that breaks the storage container. Releases could happen as a result of human error or an equipment malfunction, or more rarely as a deliberate act. A vehicle transporting hazardous

materials may have an accident, which could cause the material to escape. Pipelines used for hazardous materials, including petroleum or natural gas, may rupture due to an accident, a natural hazard such as an earthquake, or a malfunction, creating an additional risk of hazardous materials release.

Existing Hazardous Material Conditions

The California Department of Toxic Substances Control (DTSC) maintains a list known as the Cortese List, which identifies sites where hazardous materials are present and cleanup activities are necessary. There are no facilities in Morro Bay on the Cortese List (DTSC n.d.), although two facilities are in the vicinity. The Baywood Park Training Area, now partially included in Montana de Oro State Park, is a 9,100-acre former Department of Defense site located about 4 miles south of Downtown Morro Bay. The site contains munitions and unexploded ordnance, and while investigations and removal activities have occurred, some residual risk may always persist (DTSC 2005a). Camp San Luis, located approximately 8.5 miles east of Downtown Morro Bay, was previously used as a National Guard post and an army camp, and may also have leftover munitions and unexploded ordnance (DTSC 2005b).

In Morro Bay, there are four known facilities that are not currently subject to state or federal response activities where hazardous materials are still present or may be present. The closed Dynegy Morro Bay Power Plant has undergone extensive remediation activities to remove hazardous materials. DTSC declared in 2014 that the site poses no significant health or environmental hazard (DTSC 2014). Two additional former military sites (one near the intersection of Panorama Drive and Nevis Street, the other near the intersection of the Embarcadero and Coleman Street) are in need of evaluation to determine the hazardous materials risk, and one additional site (in the foothills near Little Morro Creek Road) has been sufficiently cleaned and no further action is required (DTSC 1997, 2005c, 2005d).

The California State Water Resources Control Board (SWRCB) maintains a separate list of sites with hazardous materials that may contaminate groundwater supplies. There are 21 of these facilities located in Morro Bay, some of which are also listed by DTSC. Of these 21 facilities, 18 have finished all cleanup activities and formal case closure decisions have been issued, although any future development activities on these sites may require remediation activities and special permitting to ensure that people and the

environment are not exposed to any newly unearthed contaminated material. Three facilities are still open: the Dynegy power plant, where cleanup actions have finished and monitoring activities are ongoing to ensure the cleanup was successful; the former Texaco facility near Del Mar Park, which is subject to evaluation activities; and the Chevron Estero Bay Marine Terminal at Highway 1 and Morro Road, where remediation activities are ongoing (SWRCB 2016a). There are also 15 permitted underground storage tanks in Morro Bay, which may store hazardous or potentially hazardous materials (SWRCB 2016b).

One other facility in the vicinity which may pose a hazardous materials risk is the Diablo Canyon Power Plant located about 10 miles south of Morro Bay. Diablo Canyon is the one remaining operational nuclear power plant in California, and is expected to remain in operation until its license expires in 2025 (Baker 2016). The facility is built on a fault line and is located on the coast, raising concerns that it may be vulnerable to both seismic hazards and coastal hazards such as tsunamis, although Diablo Canyon is designed to be highly resilient to these emergency situations (City of Morro Bay 2006). The primary safety concern for Morro Bay is the accidental release of nuclear materials into the environment.

Emergency situations at nuclear power plants are ranked on a four-tier system. Only the most severe situation, designated as a General Emergency, would pose a threat to Morro Bay (County of San Luis Obispo 2016a). In such a situation, Morro Bay residents may be asked to shelter in place or to evacuate. Morro Bay is located just beyond the federally defined 10-mile Emergency Planning Zone that surrounds Diablo Canyon, although the community is within the expanded state-defined Emergency Planning Zone (County of San Luis Obispo 2007, 2016b), identified in Figure 8.6 as Preparation Action Zone 9.

Morro Bay may be subject to hazardous material releases from a transportation accident. Small amounts of hazardous materials may be transported into and through the community on Highway 1 and SR 41. Accidents along these roadways may create a hazardous materials emergency, although the small volumes of hazardous materials involved may limit the risk. Aircraft and watercraft also may transport small amounts of hazardous waste, although accidents involving these vehicles may pose a greater environmental risk (City of Morro Bay 2006).

The risk from pipelines in Morro Bay involves existing in-service natural gas pipelines and abandoned pipelines once used for petroleum and related products. The Southern California Gas Company (SoCalGas), which provides natural gas service to Morro Bay, operates pipelines in the community. A large transmission line intended to transport natural gas across significant distances enters Morro Bay from the east along Highway 1, running alongside Highway 1 until it terminates near where Main Street crosses under Highway 1. Two high-volume (but smaller) distribution lines run north from this point: one continuing along Highway 1 north to Cambria, the other running northeast toward Atascadero (SoCalGas n.d.). The City designates these pipelines as very low risk. There are a number of abandoned pipelines in the community, some of which have been fully decontaminated and decommissioned. The other abandoned pipelines are generally not expected to pose a threat to human health and safety, although they may threaten ecological health (City of Morro Bay 2006).

Historic Hazardous Material Events

The Morro Bay Fire Department responds to several actual or potential hazardous material releases each year. These events often involve small quantities of hazardous materials, and do not usually pose a substantial health or safety risk. However, on occasion larger events may pose more significant risks. One of the highest profile hazardous material releases in Morro Bay occurred in 2001, when a vehicle accident at a fish processing facility ruptured a valve on a refrigeration system, causing an ammonia leak. Approximately 3,000 people were evacuated for nine hours while the leak was fixed (NOAA 2001; City of Morro Bay 2006).

COASTAL HAZARDS

Coastal hazards are related to marine processes and impacts from coastal hazards are generally limited to areas adjacent to the ocean. This category of hazards covers a broad range of hazardous situations, including coastal flooding, sea level rise, tsunamis and seiches, and erosion of coastal environments. While these hazards are presented here for the sake of completeness, these hazards are also discussed in the Coastal Resources & Resiliency and the Shoreline Management & Protection baseline assessments.

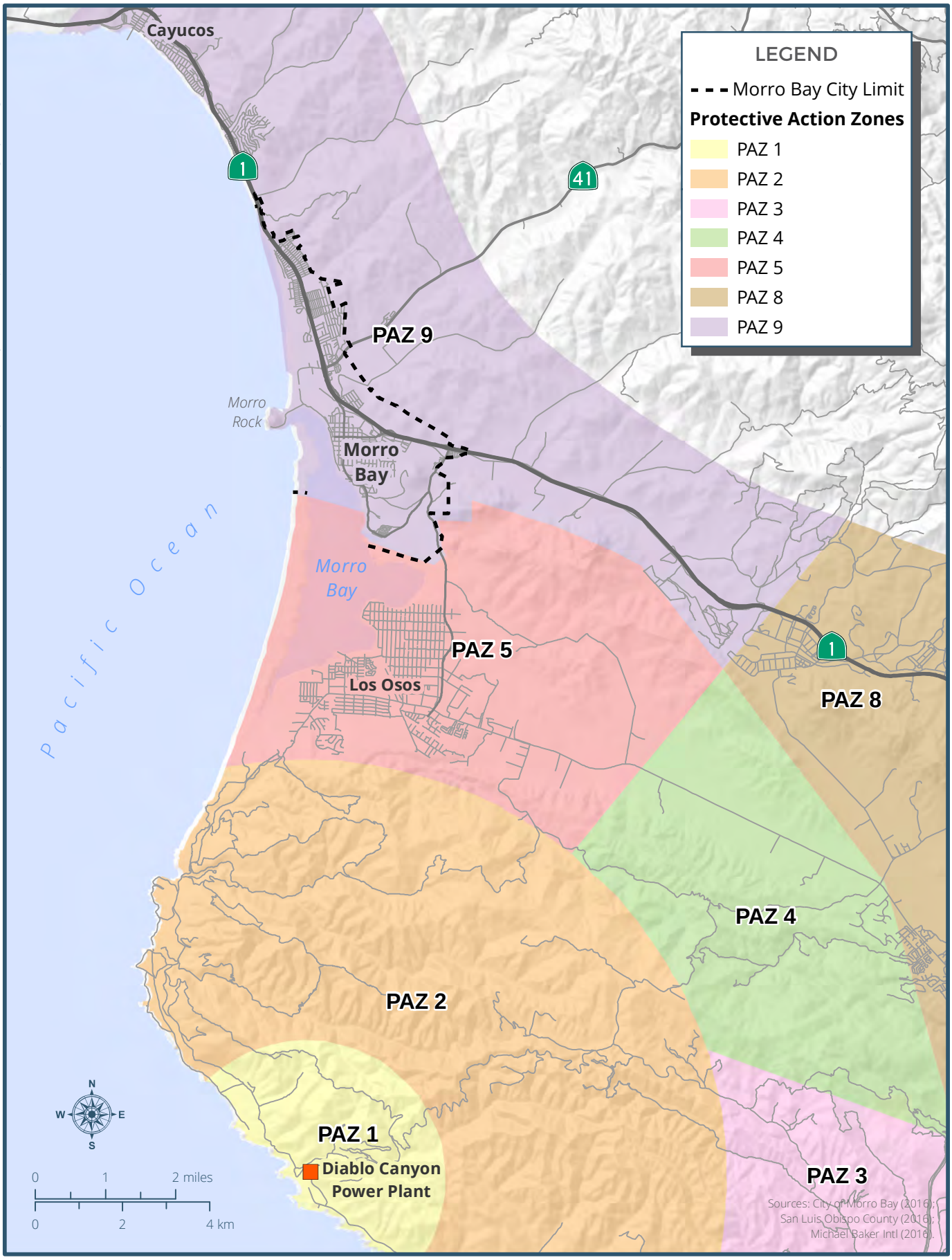

FIGURE 8.6

Nuclear Emergency Planning Zones

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Coastal flooding occurs when ocean water temporarily inundates normally dry land. Extreme high tides, sometimes called king tides or perigean spring tides, typically occur a few times a year. Unlike most other hazards, the severity of extreme high tides and the frequency with which they occur can be accurately predicted, allowing for ample notification if the high tide may pose a safety hazard. Coastal flooding can also occur during strong storms as a result of large waves generated by the storm. The winds of very strong storms can push water ashore in a phenomenon known as a storm surge. This hazard is usually associated with tropical cyclones such as hurricanes, although extratropical cyclones may also cause a storm surge.

While sea level rise is also a naturally occurring process, sea level rise as a potential hazard is driven by climate change as a result of human activities. This human-induced sea level rise is primarily caused by ice on Earth's surface melting due to warmer temperatures. The meltwater runs into the seas, causing ocean levels to increase globally. A smaller portion of sea level rise is also the result of thermal expansion, as water expands when temperatures rise (IPCC 2013). Sea level rise is a slow process, but nevertheless can have significant impacts. Low-level areas near the shore can be permanently inundated, and other areas may be temporarily flooded due to other factors.

A tsunami is a type of wave generated by the sudden displacement of a large amount of water, compared to conventional waves which are driven by winds and tides. Earthquakes, landslides, volcanic eruptions, or similar events occurring underwater or on the shore can cause sudden displacement, triggering a tsunami. Tsunami waves travel extremely quickly, sometimes in excess of 500 miles per hour, but in the open ocean are no more than a few feet tall and often go unnoticed by ships. As the wave approaches the shore, the shallow water forces the wave to compress and grow in height. The tsunami, which now resembles a wall of water or a very rapidly rising tide rather than a conventional wave, washes ashore and can cause significant damage to coastal areas. Tsunami waves can exceed 100 feet tall, and some tsunami events may consist of multiple waves. Tsunamis can travel thousands of miles from the triggering event, although they do lose some energy as they travel (NOAA 2016b). A related hazard, called a seiche, occurs when a sudden displacement event or very strong winds happen within an enclosed or semi-enclosed body of water such as a lake or bay. This causes the water to "slosh" around the water body, creating waves that behave similar to tsunami waves (NOAA 2015).

High tides and waves can cause erosion of beach environments, including sand dunes. Over time, this erosion can degrade coastal access, decrease beach quality, and weaken dunes that help to protect coastal structures. While erosion is driven by natural processes, human activities such as shoreline hardening, dredging, and coastal structures can alter natural processes and exacerbate erosion.

Existing Coastal Hazard Conditions

A large section of Morro Bay is located near the beach and so is vulnerable to coastal hazards. Coastal flooding is included on the flood maps provided by FEMA. All of Morro Bay's beaches lie within the 100-year floodplain, while coastal properties beyond the beach sit within either the 100-year or 500-year floodplain. In some instances, the floodplain barely extends beyond the beach itself, although near creeks and estuaries the water from a coastal flood may extend significantly farther inland, creating a much larger floodplain (FEMA 2016). Sea level rise is generally not severe enough at present to pose a current threat, although as sea level rise continues into the future the threats associated with it become substantially greater.

The tsunami risk is Morro Bay is greater in the northern part of the community. Some neighborhoods in northern Morro Bay near Beachcomber Street lie within the tsunami inundation zone. Between Azure Street and SR 41, the tsunami inundation zone extends to Highway 1; between SR 41 and the power plant, the inundation zone extends out to Little Morro Creek Road. South of the power plant, the tsunami inundation zone is mostly limited to the immediate beach area, although the marina and its surroundings are also located within the tsunami inundation zone (CGS 2009). Figure 8.7 shows the tsunami hazard zone in Morro Bay.

The wide beach and tall sand dunes present in southern Morro Bay largely protect this section of the community from erosion risk, although the beach and dunes themselves may be eroded during severe storms. Northern Morro Bay, which is directly exposed to the ocean and does not enjoy the protection of the bay and sandspit, has a somewhat higher erosion risk. However, northern Morro Bay also has a wide sloping beach and a series of small sand dunes which can buffer homes in this part of the community. The beach and dunes can be eroded by storms, but they are generally replenished during the summer through natural processes (City of Morro Bay 2006).

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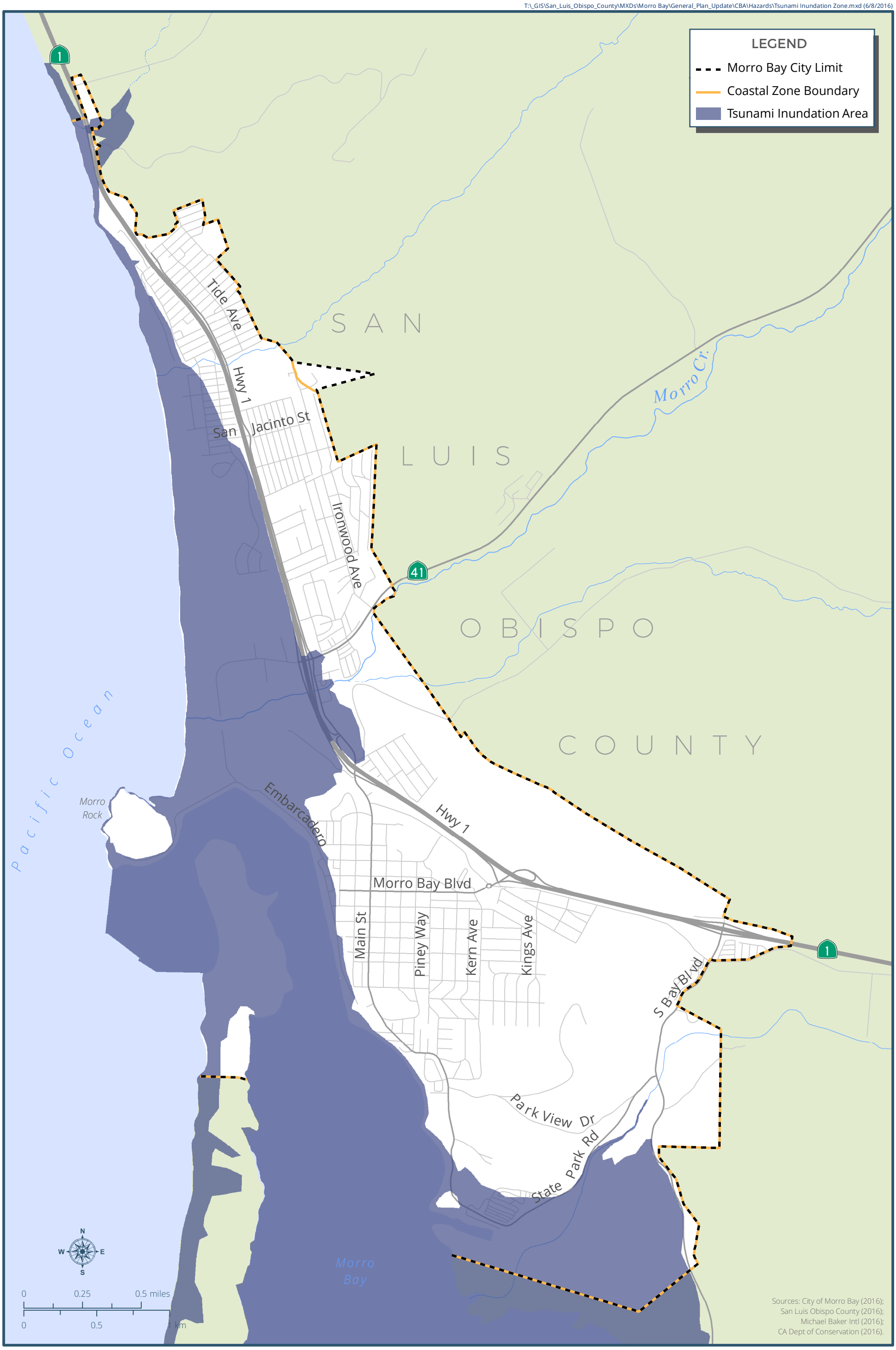

Plan MORRO BAY

FIGURE 8.7

Tsunami Inundation Zone

Page 2

Historic Coastal Hazards

There have been numerous historical coastal flooding events in Morro Bay, usually resulting from strong storms and heavy surf. Most of these flood events affected only the immediate beach area, although on occasion there have been more severe coastal flooding events. In 1998, intense storms driven by a strong El Niño produced surf as high as 25 feet along the San Luis Obispo County coast. The Morro Bay breakwater and jetties at the entrance of the harbor were damaged by the waves (City of Morro Bay 2006).

Tsunamis have also affected Morro Bay in the past. On April 1, 1946, an 8.6 M_w earthquake struck the Aleutian Islands in Alaska, triggering a tsunami that affected much of the Pacific. While the tsunami had a much greater effect in Hawaii and the Pacific Northwest (USC n.d.), Morro Bay saw tsunami waves 5 feet in height (City of Morro Bay 2006). On March 27, 1964, a 9.2 M_w earthquake occurred near Anchorage, Alaska, setting off tsunamis that rose to heights of over 5 feet at Morro Bay and caused 12 deaths elsewhere in California (City of Morro Bay 2006; Cal OES 2013). More recently, the 2011 Tōhoku earthquake in Japan caused rapid 8-foot tidal shifts in Morro Bay, although advance warning of the event reduced damage (Koenen 2011).

8.2 POTENTIAL FUTURE HAZARD CONDITIONS

The risks posed by hazards are not constant, and may change as a result of a variety of factors. As populations grow and demographics change, people may become more vulnerable to an existing hazard condition, such as when an aging population may lack financial resources to improve resiliency to disasters, or may have limited mobility that affects evacuation. Population growth can encourage development in areas that may face increased risk of hazards, such as when a community begins to build houses in more rural areas that are prone to wildfires. Additionally, hazards themselves may become more or less frequent and/or severe over time. Climate change is a primary driver of this, causing large shifts in Earth's climate system that affect hazards such as drought, wildfire, and flooding.

PROJECTED SEISMIC AND GEOLOGIC HAZARD RISK

Seismic and geologic hazards will almost certainly continue to occur in Morro Bay, as these events have occurred in the past and no evidence suggests that the factors that drive these hazards are declining. As previously discussed, most of the fault lines in the region have less than a 1.5 percent chance of causing a 6.7 M_w or larger earthquake in the next 30 years. However, these faults are considered active or potentially active, and may have a higher risk of causing an earthquake lower than 6.7 M_w. The San Andreas fault is located farther from Morro Bay, but it is substantially more likely to cause a major earthquake. Impacts in Morro Bay are likely to be buffered by the distance from the fault.

A major earthquake on the San Andreas fault would be a significant event. An earthquake on nearby sections of the San Andreas fault measuring 7.7 M_w to 7.9 M_w would be felt throughout Central and Northern California, causing widespread damage disrupting normal activities. Expected shaking in Morro Bay is expected to measure VI (Strong) on the Mercalli scale, enough to cause potentially significant damage but unlikely to be devastating (USGS 2013a, 2013b, 2013c, 2013d).

The San Andreas fault may not be the source of the most damaging earthquake to Morro Bay. Other less well-known fault lines closer to Morro Bay may cause earthquakes with more significant impacts. An earthquake measuring 7.0 M_w on the Los Osos fault could occur approximately 8.5 miles south of Downtown Morro Bay. Shaking in Morro Bay from such an event could measure VIII (Severe) or potentially higher on the Mercalli intensity scale (USGS 2013e). A 7.3 M_w earthquake on the Hosgri fault, located approximately 33 miles south of Downtown Morro Bay, could cause shaking in Morro Bay measuring VI to VII (Strong to Very Strong) on the Mercalli scale (USGS 2013f).

The most severe modeled scenario, a 7.5 M_w earthquake on the Hosgri fault centered approximately 7.5 miles northwest of Morro Rock, could cause shaking in Morro Bay measuring VIII to IX (Severe to Violent) on the Mercalli scale. Such an event could be very damaging to Morro Bay, destroying underground utilities and causing severe harm to buildings. Moreover, this earthquake's Mercalli intensity would measure at least VII (Very Strong) throughout the western half of San Luis Obispo County and at least VI (Strong) elsewhere in the county, running a significant risk of regional destruction. Long-term

damage to the region could be substantially detrimental to tourism in Morro Bay, harming the local economy (USGS 2009a). Even a smaller version of this earthquake, measuring 7.1 M_w, would likely cause significant damage in Morro Bay (USGS 2009b).

As presented earlier in Current Seismic and Geologic Hazards, the odds of a significant earthquake occurring on most regional faults is low (at most, 1.3 percent in the next 30 years), but not nonexistent. The odds of a major event on the San Andreas fault are substantially higher (up to 20 percent in the next 30 years).

Climate change may affect the risk of landslides not driven by seismic activity. Changes in intense rainfall patterns may lead to an increase in precipitation-related landslides.

PROJECTED WILDFIRE RISK

Wildfires are a regular part of the ecosystem in large sections of California, and they have occurred occasionally in the vicinity of Morro Bay. Given the recurring nature of wildfires in the area, future expectations are that wildfires will continue to occur. Climate change is expected to affect many of the factors that influence wildfires, including temperatures, precipitation levels, and overall drought conditions. By the end of this century, Morro Bay is expected to see mild increases in areas burned by wildfires (up to 15 percent more than current conditions) (CEC 2016).

PROJECTED FLOOD RISK

Flood risks will continue to exist in and around Morro Bay. Floods driven by intense precipitation are expected to continue to occur, as these are a natural part of the local climate. Climate change is expected to cause an overall decrease in precipitation in the wider Central Coast region. Morro Bay currently experiences an average of 17 inches of rainfall a year (WRCC 2015), but this may decline to an average of 13-14 inches by 2100 (CNRA and Cal OES 2012). However, flood risk in the area may increase due to possible changes in the AR storms that deliver most of the intense precipitation to Morro Bay. Some studies suggest that Northern California will experience an increase in the number of AR storms, although the average intensity of a typical storm will remain unchanged. Southern California will experience about the same number of AR storms, but with a 10–20 percent increase in average intensity (Oskin 2014). However, the impacts on the

Central Coast region are unknown, as it is not clear which of the two (or both) forecasted changes in AR storms apply to the region.

Climate change can also increase flood risks by causing more frequent droughts. The drought risk in California is expected to increase as a result of climate change, and droughts typically cause soil to harden and become less permeable. When this happens, precipitation is not absorbed into the soil as quickly or effectively, causing an increased risk of ponding or increased runoff.

PROJECTED DROUGHT RISK

The drought risk in Morro Bay and the wider Central Coast region is expected to become greater in the future. While occasional droughts are a regular feature of California's climate, scientists anticipate that droughts will become more frequent and more severe. The Central Coast region is expected to experience a decline in precipitation of about 2 inches by 2050, and of about 3–4 inches by 2100 (CNRA and Cal OES 2012), translating to precipitation levels of approximately 15 inches in an average year for Morro Bay by 2050, or 13–14 inches by 2100 (WRCC 2015). Due to warmer temperatures, more precipitation in the Sierra Nevada is expected to fall as rain instead of snow, and snow is expected to melt faster (CNRA and Cal OES 2012). On top of overall projected decreases in precipitation, these shifts in the Sierra Nevada may make less SWP water available to Morro Bay. Recent studies suggest that the drought which began in 2012 was exacerbated by climate change and may be a harbinger of future drought conditions (Williams et al. 2015).

PROJECTED RADIATION AND HAZARDOUS MATERIALS RISK

The risk from hazardous materials is expected to persist in Morro Bay, as facilities that use hazardous materials will continue to exist in the community. While containment technology may improve and hazardous materials regulations may become more stringent, some degree of risk will persist. In June 2016, the Pacific Gas and Electric Company, the owner of the Diablo Canyon Power Plant, announced it will close the facility when its operating license expires in 2025 (Baker 2016). Until 2025, Diablo Canyon will continue to receive radioactive material and the risk of exposure to these

materials is likely to remain the same. However, even after Diablo Canyon closes, nuclear material would still be stored on-site (at least temporarily), and so some degree of risk of nuclear materials release would continue, although potentially at lower levels.

PROJECTED COASTAL HAZARD RISK

Coastal hazards in Morro Bay are likely to continue to pose a threat to the community. Coastal flooding will remain a risk, given that coastal flooding has occurred on occasion in the past and strong storms such as AR events may become more frequent and/or more severe in Morro Bay (Oskin 2014). Tsunamis are expected to continue to occur, although the risk of a serious tsunami remains low.

One coastal hazard, sea level rise, is exclusively a future hazard. Although at present sea levels have generally not risen enough to pose a substantial threat to Morro Bay, future sea level rise may be great enough to create hazardous conditions. While projections of future sea level rise vary, some studies indicate that by 2100, ocean levels may have increased by as much as 66 inches, or 5.5 feet (CCC 2015). At 5 feet of sea level rise, projections show that the marina, parts of the Morro Bay Golf Course, and the inlets of Morro and Toro Creeks would be inundated. Additionally, large sections of the beach north of Morro Rock would be underwater. At 6 or more feet of sea level rise, inundation of The Embarcadero may begin (NOAA 2016c). Sea level rise also increases the risk of coastal flooding and erosion by moving the ocean level closer to existing structures, decreasing the required severity of a flood or erosion event before it begins to have an impact on homes, businesses, or infrastructure. Additional discussion of how coastal hazard risks may change in the future can be found in Chapter 3, Coastal Resources & Resiliency and Chapter 12, Shoreline Management & Protection.

8.3 REGULATORY SETTING

This section details the federal, state, and local laws, regulations, agencies, plans, and policies that pertain to natural and environmental hazards in Morro Bay.

FEDERAL REGULATIONS

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a program administered by FEMA to provide subsidized flood insurance for property owners in communities. The NFIP establishes regulations that limit development in flood-prone areas. The boundaries of flood-prone areas are determined by FEMA's Flood Insurance Rate Maps, which provide flood information and identify the flood hazard in the community. In certain high-risk areas, federally regulated or insured lenders require property owners to have flood insurance before issuing a mortgage.

Executive Order 11988

Executive Order (EO) 11988 (1977) addresses floodplain issues related to public safety, conservation, and economics. It requires federal agencies that construct, permit, or fund a project located in a floodplain to avoid development that is generally incompatible with the floodplain or would otherwise have adverse effects on flood risks. Developments to which EO 19988 applies should also be consistent with the standards and criteria of the NFIP, and restore and preserve natural and beneficial floodplain values. Federal agencies are required to take floodplain management into account when creating or reviewing land use and water plans.

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was passed in 1977 to reduce the threat to life and property from earthquakes by establishing the National Earthquake Hazards Reduction Program (NEHRP). The act was significantly amended in 1990 by the NEHRP Act, which redefined agency responsibilities, program goals, and objectives. The NEHRP

is a coordinated nationwide program that addresses many factors related to earthquake safety, including improved understanding and prediction of earthquake-related hazards and vulnerabilities, improved building codes and land use practices, development of more resilient design and construction techniques, improved mitigation capacity, and accelerated effective implementation of earthquake-related research. The NEHRP is led by FEMA, with support from a number of other agencies and organizations.

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) was established in 1974 to ensure the safe use of radioactive materials for civilian purposes, and is responsible for licensing and regulating civilian use of radioactive materials. Areas under the NRC's regulatory purview include nuclear reactors for power plants and civilian research, the use and transport of nuclear materials for civilian purposes, and safe disposal of radioactive waste materials. The NRC's role includes licensing the operation of nuclear power plants, and it is responsible for ensuring that these power plants operate safely.

STATE REGULATIONS

California Government Code – Safety Element Requirements

California Government Code Section 65302(g) includes specific requirements for the safety element of local general plans. It specifies that safety elements must address the risk resulting from surface rupture, ground shaking, ground failure, tsunami, seiche, dam failure, mudslides and landslides, subsidence, liquefaction, other known geologic hazards, flooding, and wildland and urban fires, to the extent that these hazards are present in the community. It requires safety elements to include mapping of known seismic and geologic hazards, and to address evacuation routes, military installations if applicable, peak load water requirements, and minimum road widths and clearances around structures. Safety elements must address a number of specific items related to flooding and wildfires as outlined in Government Code Sections 65302(g)(3) and 65302(g)(4).

Senate Bill 379 (2015) amended the California Government Code to require that upon the next update to a city's hazard mitigation plan after 2017, or after 2022 if a city has no hazard mitigation plan, the safety element be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to that city or county. The bill requires the update to include a set of goals, policies, and objectives based on a vulnerability assessment that identifies both the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies.

Assembly Bill 2140

Assembly Bill (AB) 2140 (Government Code Sections 8685.9 and 65302.6) passed in 2006, allows local communities to adopt a local hazard mitigation plan (LHMP) into the safety element, and specifies certain elements that must be included in the LHMP if a community chooses to prepare one. Typically, when a federal disaster is declared, FEMA will provide disaster relief funds up to 75 percent of the total cost of eligible reconstruction activities. Of the remaining 25 percent not covered by FEMA, the California state government can contribute up to 75 percent (18.75 percent of the total), leaving 25 percent of the remaining costs (6.25 percent of the total) to be covered by the local governments. AB 2140 allows the state to pay for more of the funding not covered by FEMA if the local government has incorporated an LHMP into its safety element, decreasing the amount of disaster relief funds that must be provided by the local government. By including the LHMP in the safety element, communities can also ensure that the two documents are consistent.

Hazardous Waste Control Act

The Hazardous Waste Control Act (Health and Safety Code Sections 25100 et seq.) describes requirements for the proper management of hazardous wastes in California. It establishes a statewide hazardous waste management program similar to the one created by the federal Resource Conservation and Recovery Act, but is more stringent. It covers a number of areas, including identifying and classifying hazardous waste, generation and transportation of hazardous waste, design and permitting of hazardous waste facilities (including recycling, treatment, storage, and disposal facilities), treatment standards, facility operation and staff training, and closure of facilities and liability

requirements. The Hazardous Waste Control Act also lists more than 800 hazardous and potentially hazardous materials and requirements associated with them.

Emergency Services Act

California's Emergency Services Act (California Government Code Sections 8550-8668) includes a number of provisions to protect the health, safety, and property of state residents. Under the Emergency Services Act, California developed an emergency response plan to coordinate services between federal, state, and local agencies. The plan is administered by the California Office of Emergency Services (Cal OES), and involves other groups such as the California Environmental Protection Agency, the California Highway Patrol, regional water and air quality agencies, and local disaster response offices.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Section 2621) addresses hazards from surface fault rupture. It requires the California Geologic Survey (CGS) to map areas around active and potentially active faults where fault rupture may prove a hazard. Under the act, no structures intended for human occupancy can be built across an active fault, and structures for human occupancy built within an area of around 200 to 500 feet from an active fault can only be permitted following the completion of a fault location report. Structures within fault rupture hazard zones must incorporate siting and design recommendations into planning and construction to reduce the risk from this hazard.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (Public Resources Code Sections 2690–2699.6] addresses seismic and geologic hazards beyond fault rupture. It directs CGS to prepare maps identifying seismic hazard zones and encourages local governments to include policies that reduce seismic hazards in the safety elements of their general plans. Under the Seismic Hazards Mapping Act, development projects within a seismic hazard zone must prepare a geotechnical report identifying and delineating any applicable seismic

hazards before the project is approved. After local governments approve these reports, they must be submitted to the State Geologist.

California Building Standards Code

The California Building Standards Code (BSC, Title 24 of the California Code of Regulations) contains minimum standards for all new construction and significant remodels of existing structures that address a variety of issues. Parts of the BSC address safety from hazards, particularly around seismic hazards and fires. Requirements of the BSC include minimum standards for structural design, necessary tests and inspections, provisions addressing building foundations, and standards for the use of certain materials.

LOCAL REGULATIONS

Morro Bay Local Hazard Mitigation Plan

The Morro Bay LHMP is a plan to improve resiliency in the community by identifying natural hazards present in Morro Bay, determining the community's vulnerability to each hazard, and identifying development mitigation strategies to reduce vulnerability before emergency situations develop. Morro Bay's LHMP was adopted in 2006 and addresses nine hazards. The LHMP also contains nine goals to improve resiliency. Objectives and mitigation actions are associated with each goal. Morro Bay's LHMP identifies earthquakes (including fault rupture and liquefaction), floods, landslides, and hazardous material releases as the most significant hazards present in the community. As of August 2016, the City is in the process of updating the LHMP, and is currently developing the mitigation strategies.

Morro Bay Multi-Hazard Emergency Response Plan

The Morro Bay Multi-Hazard Emergency Response Plan contains City policies and operational concepts for responding to emergency situations, and is generally only consulted when an emergency occurs. Most of the hazards in the response plan are also contained in the LHMP. The policies and general approach to emergency situations delineated in the plan follow a number of widely adopted emergency response

standards and operations protocols, including the National Incident Management System, the State Emergency Management System, and the Incident Command System.

8.4 PRIORITY FINDINGS

LOCAL EARTHQUAKES

The San Andreas fault is the fault in the region most likely to cause a major earthquake. Sections of the fault in San Luis Obispo County have approximately a 17–20 percent chance of causing an earthquake measuring 6.7 M_W or greater in the next 30 years, with approximately a 6 percent chance of causing an 8.0 M_W or greater event (USGS 2015b). A significant earthquake on the Hosgri fault would likely have a greater effect on Morro Bay than one on the San Andreas fault, due to the proximity of the Hosgri fault. Regardless of where an earthquake occurs, there are many fault lines which could produce shaking of at least VI (Strong) on the Mercalli scale, large enough to cause substantial damage.

While California's current building codes require structures to be resilient to earthquakes, these structures may not be strong enough to withstand an event such as a 7.5 Mw Hosgri earthquake, the reasonably plausible scenario that would likely generate the strongest shaking in Morro Bay. The risk of such an event is low (approximately 0.6 percent chance of occurring in the next 30 years, or a 1-in-167 chance (USGS 2015b)), but the potential damage from this and other local earthquakes still poses a threat to Morro Bay. Moreover, many of Morro Bay's homes and nonresidential buildings were constructed before modern earthquake-resistant building codes were put into place, and so a substantial earthquake has an increased risk of causing widespread damage to existing structures if they are not sufficiently retrofitted. The City must take steps to ensure that the community is prepared and made resilient to such earthquakes.

CLIMATE CHANGE VULNERABILITY

Many of the hazards that pose a risk to Morro Bay may increase as a result of climate change. Intense storms may become more frequent and/or more severe, droughts are likely to become worse, and the risk from coastal flooding is expected to increase due to sea level rise. There are also other potential hazards, such as extreme heat and exposure to disease-carrying pests such as mosquitos, which have not been historically associated with Morro Bay. Greater parts of Morro Bay may be at risk from these hazards, and certain populations, such as elderly residents, may be disproportionately affected.

Climate change means that some current policies and activities to mitigate hazard risks in Morro Bay may be less effective in the future. The City will need new strategies to improve resiliency to climate change-exacerbated hazards, and to ensure that Morro Bay residents and visitors remain safe. This includes monitoring the latest science pertaining to these hazards and appropriately responding to changes in hazard scenarios by updating City plans, policies, and practices.

IMPACTS TO WATER SUPPLY

As previously discussed, Morro Bay's water comes from a variety of sources. Morro Bay has access to approximately 3,680 acre-feet of water, which is substantially more than the community requires. Water from local groundwater basins comprises 47 percent of available supplies; water from the SWP makes up approximately 36 percent of supplies; and the remaining approximately 16 percent of available supplies comes from Morro Bay's local desalination plant (City of Morro Bay 2011). Morro Bay's future water reclamation facility is also expected to supply some water for nondrinkable purposes, such as irrigation.

Despite this diversity, Morro Bay's water supply is vulnerable to shortages. The SWP is highly susceptible to drought as a result of climate change. In 2015, San Luis Obispo County only received 20 percent of its requested allocation from the SWP as a result of drought conditions (DWR 2015). Groundwater supplies are also vulnerable to drought conditions due to a lack of precipitation needed to recharge them, and may also face additional hazards from sea level rise. Morro Bay's water comes from two groundwater basins, Chorro Valley and Morro Valley, both of which border the Pacific Ocean, and

saltwater intrusion is a primary issue of concern for both (County of San Luis Obispo 2014). Saltwater intrusion occurs when salty water from an ocean or other water body moves into groundwater basins as a result of drought conditions when groundwater levels decrease, or as a consequence of sea level rise. Saltwater intrusion can contaminate groundwater supplies for decades, requiring expensive and energy-intensive desalination solutions. As both factors are likely to occur in the future, the risk of saltwater intrusion is elevated.

Morro Bay's water supply will face increasing pressure in the future. Even without increased development, future water supplies may be threatened. Conservation measures established as a result of drought conditions appear to be working. In the second half of 2015, Morro Bay residents successfully reduced water use by over 19 percent compared to 2013, exceeding the reduction target of 12 percent (SWRCB 2016c). The community must continue existing conservation efforts and reduce water use through more extensive strategies, even if drought conditions end.

DIABLO CANYON POWER PLANT

Although the Diablo Canyon Power Plant will not be relicensed to operate after 2025, there will continue to be some risk of nuclear material release from the site. The United States lacks a long-term repository for high-level radioactive waste produced by nuclear power plants; thus, this material is stored on a power plant site, even after the plant has ceased operations. While the Diablo Canyon facility and its on-site storage containers have a number of systems to prevent the release of radioactive material and are built to withstand natural disasters such as earthquakes, a radiation event is nevertheless possible.

Beyond advocating for policies that reduce the amount of nuclear material at the Diablo Canyon site or increase the safety standards that apply to the facility and any storage sites, the City of Morro Bay cannot affect the chances of a release of radioactive material from Diablo Canyon. The City instead must ensure that residents, businesses, and the municipal government are prepared to appropriately respond in the event of a radioactive incident. The odds of such an event are low, but a radioactive incident is a potential hazard of significant concern that the City must effectively address.

INCORPORATION OF THE LHMP IN THE SAFETY ELEMENT

AB 2140 allows local communities to incorporate the LHMP into the safety element, which helps to ensure plan consistency and can reduce the amount of disaster relief funds that must be paid by the local government in the event of a disaster. To ensure that Morro Bay receives these benefits, the Safety Element of the General Plan should incorporate the City's LHMP by reference as through it were fully set forth therein.

9.0 Natural Resources

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9.0 NATURAL RESOURCES

This chapter identifies existing biological resources, habitat, and wildlife corridor conditions in the planning area and discusses how those conditions would reasonably be expected to change given projected population, economic, and environmental conditions. This chapter also summarizes applicable regulations related to these resources. Species and conditions were identified using the California Department of Fish and Wildlife (CDFW) RareFind5 Database, United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC), and California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California database search tools. Chapter 7 contains a discussion of the scenic viewsheds in and around the planning area.

9.1 EXISTING CONDITIONS

VEGETATION COMMUNITIES AND HABITATS

Morro Bay has a wide diversity of tree (hardwood and coniferous forests, oak woodlands), shrub (chaparrals, coastal scrubs), and herbaceous (grasslands) terrestrial habitat types, as well as aquatic habitat types. The vegetation communities and wildlife habitats described as occurring in the city are based on the CDFW's California Wildlife Habitat Relationship (CWHR) classification system (CDFW 2008), and are shown in Figure 9.1. The corresponding alliances in the discussions below are defined as vegetation classification units containing one or more associations (a primary vegetation type), and defined by a characteristic range of species composition, habitat conditions, physical characteristics, and diagnostic species, typically at least one of which is found in the uppermost or dominant layer of the vegetation (Jennings et al. 2009).

WOODLANDS

Conifer and hardwood forests and woodlands in the city are shown in Figure 9.1. These tree-dominated habitats can support diverse wildlife populations. Riparian woodlands are generally the terrestrial areas adjacent to freshwater bodies forming a

vegetated corridor from stream edge to floodplain edge. Riparian woodlands occur in and along creeks and streams in the city. The following are descriptions of types of tree-dominated habitats that occur in the city.

Coastal Oak Woodland. Coastal oak woodlands, such as those identified in Morro Bay, are extremely variable in structure. The overstory consists of deciduous and evergreen hardwoods, sometimes mixed with scattered conifers. In sites with moderate moisture, the trees are dense and form a closed canopy. In drier sites, the trees are widely spaced, forming an open woodland or savannah. The understory is equally variable. In some instances, it is composed of shrubs from adjacent chaparral or coastal scrub which forms a dense, almost impenetrable understory. More commonly, shrubs are scattered under and between trees. Where trees form a closed canopy, the understory varies from a lush cover of shade-tolerant shrubs, ferns, and herbs to sparse cover with a thick carpet of litter. When trees are scattered and form an open woodland, the understory is grassland, sometimes with scattered shrubs. Slope, soil, precipitation, moisture availability, and air temperature cause the variations in structure of coastal oak woodlands. These factors vary along the latitudinal, longitudinal, and elevational gradients over which coastal oak woodlands are found.

Composition of both the overstory and understory of coastal oak woodland varies and reflects the environmental diversity over which this habitat occurs. In Morro Bay, the coastal oak woodlands are typically dominated by coast live oak (*Quercus agrifolia*).

Montane Hardwood Forest. A typical montane hardwood habitat is composed of a pronounced hardwood tree layer, with an infrequent and poorly developed shrub layer, and a sparse herbaceous layer. In the Coast Range, canyon live oak (*Quercus chrysolepis*) often forms pure stands on steep canyon slopes and rocky ridge tops. At low elevations, such as in the City of Morro Bay, knobcone pine (*Pinus attenuata*), foothill pine (*Pinus sabiniana*), and coast live oak are abundant. Understory vegetation is mostly scattered woody shrubs and a few forbs. Elevations range from 300 feet near the Pacific Ocean up to 9,000 feet. Montane hardwood typically corresponds to the Canyon Live Oak Forest Alliance (Sawyer, Keeler-Wolf, and Evens 2009).

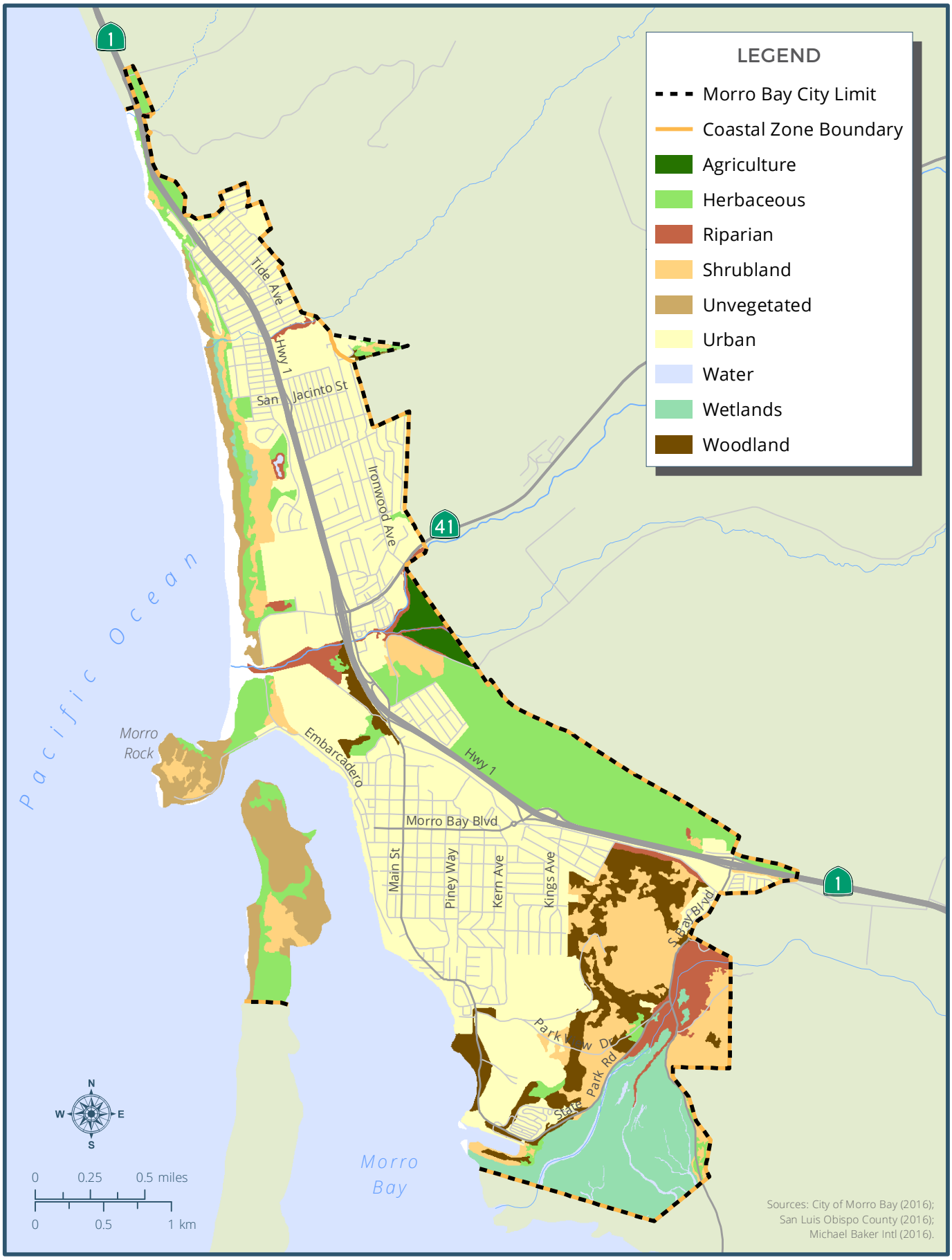

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FIGURE 9.1

Citywide Habitat Map

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Montane Hardwood-Coniferous Forest. Typical montane hardwood-coniferous forests include both conifers and hardwoods, often as a closed forest. To be considered montane hardwood-coniferous forest, at least one-third of the trees must be conifer, and at least one-third must be broad-leaved. Species composition varies by geographic region. In the Central Coast region of California, including the City of Morro Bay, common tree species include coast live oak, big leaf maple (*Acer macrophyllum*), Pacific madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflorus*), canyon live oak, and Coulter pine (*Pinus coulteri*).. Most of the broad-leaved trees are evergreen, but winter deciduous species also occur. Relatively little understory occurs under the dense, bilayered canopy. However, considerable ground and shrub cover can occur in transition areas between vegetation communities or following disturbance. Montane hardwood-coniferous forest can correspond to multiple alliances as described by Sawyer et al. (2009) depending upon the species composition. These alliances can include, but are not limited to, Pacific Madrone Forest Alliance, Coulter Pine Forest Alliance, Tanoak Forest Alliance, Canyon Live Oak Forest Alliance, and Coastal Redwood Forest Alliance.

Montane Riparian Forest. The vegetation of montane riparian forest habitats is variable and often structurally diverse. Usually, these riparian areas occur as a narrow, often dense grove of broad-leaved, winter deciduous trees with a sparse understory. In the Coast Range, including the City of Morro Bay, big leaf maple and California bay laurel (*Umbellularia californica*) are typical dominants of montane riparian habitat.

Valley Foothill Riparian Forest. This habitat type is associated with drainages in Morro Bay, particularly those with low velocity flows, floodplains, and gentle topography. This habitat is generally composed of a subcanopy tree layer dominated by cottonwoods (*Populus sp.*), sycamore (*Platanus racemosa*), and/or valley oak and an understory shrub layer typically consisting of willows (*Salix spp.*) and/or mulefat (*Baccharis salicifolia*). Valley foothill riparian can correspond to multiple alliances (Sawyer, Keeler-Wolf, and Evens 2009) depending upon the species composition. These alliances can include, but are not limited to, Sycamore Woodland Alliance, and the various cottonwood alliances, depending upon dominant species present.

Eucalyptus Forest. This habitat type typically ranges from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous and shrubby understory. In most cases, eucalyptus forms a dense stand with a closed canopy. Blue gum eucalyptus (*Eucalyptus globulus*) and red gum eucalyptus (*E.*

camaldulensis) are the most common eucalyptus species found in these stands. The understory of these areas tends to have extensive patches of leaf litter but may include species such as poison oak. Trees within this habitat type are typically planted in rows for use as a wind break.

SHRUB-DOMINATED HABITATS

Shrub-dominated habitats in the City of Morro Bay are shown in Figure 9.1. The following are descriptions of types of shrub-dominated habitats that occur in the city.

Chamise-Redshank Chaparral. This habitat type typically ranges from nearly pure stands of chamise (*Adenostoma fasciculatum*) or redshank (*A. sparsifolium*) to a mixture of both. Mature chamise-redshank chaparral is single-layered, generally lacking well-developed herbaceous ground cover and overstory trees. Shrub canopies frequently overlap, producing a dense canopy of interwoven branches. Redshank stands tend to be slightly taller and more open than chamise-dominated stands. Fire occurs regularly in chamise-redshank chaparral and influences habitat structure. In Morro Bay, occurrences of chamise-redshank chaparral typically correspond to the Chamise Shrubland Alliance (Sawyer, Keeler-Wolf, and Evens 2009).

Coastal Scrub. The coastal scrub habitat type is most similar to central coastal scrub, as described by Holland (1986), and includes areas consistent with the California sagebrush (*Artemisia californica*) scrub community (California Sagebrush Alliance) and the black sage (*Salvia mellifera*) scrub community (Black Sage Alliance) (Sawyer, Keeler-Wolf, and Evens 2009). These coastal scrub communities consist of a dense canopy of shrubs adapted to drier south-facing slopes and terraces along the coastal zone of California and northern Baja California. Vegetation in the coastal scrub type is composed primarily of soft-leaved deciduous shrubs 3 to 6 feet tall that form a dense canopy over rocky, nutrient-poor soils. Evergreen shrubs are often present within this habitat type. In Central California, from Monterey to Point Conception, coastal scrub occurs primarily below 2,000 feet on the ocean side of the coastal ranges.

Mixed Chaparral. Mixed chaparral habitat is a structurally uniform brushland type dominated by shrubs with thick, stiff evergreen leaves. Shrub height and crown cover vary with age since last burn, precipitation, aspect, and soil type. At maturity, cismontane mixed chaparral typically is a dense, nearly impenetrable thicket. On sites

with serpentine soils or steep slopes, shrub cover may be reduced and shrubs may be shorter. Leaf litter and standing dead material may accumulate in stands that have not burned for several decades. Mixed chaparral can correspond to multiple alliances (Sawyer, Keeler-Wolf, and Evens 2009) depending upon the species composition. These alliances can include, but are not limited to, Buckbrush (*Ceanothus cuneatus*) Shrubland Alliance and the Bigberry Manzanita (*Arctostaphylos glauca*) Shrubland Alliance.

HERBACEOUS-DOMINATED HABITATS

Herbaceous-dominated habitats in the City of Morro Bay are shown in Figure 9.1. These habitats are generally composed of areas dominated by grasses and other nonwoody species. The following are descriptions of types of herbaceous-dominated habitats that occur.

Coastal Salt Marsh. Coastal salt marshes occur in bays and other areas protected from the open ocean, where there is a mixing of freshwater from streams and springs with salt water from the ocean. They often intergrade with estuarine communities, and are subject to periodic inundation (Holland and Keil 1995). Coastal salt marshes occur throughout fringes of the Morro Bay Estuary and throughout southern and central western Morro Bay State Park. Species diversity in the coastal salt marsh tends to be relatively lower than other communities because few species can tolerate the high fluctuations of salinity. Plants are mostly herbaceous perennials that are adapted to growing in saline environments, and generally short-statured with smaller-sized leaves. Many species also have tissues with many air cavities, which allow them to respire in environments with low oxygen, and salt glands that allow excess salts to be excreted. Other species have cells that contain high concentrations of dissolved solutes, allowing them to absorb water without osmotic imbalances (Holland and Keil 1995). Common native plants of coastal salt marsh in Morro Bay include California saltbrush (*Atriplex californica*), spearscale (*A. triangularis*), slough sedge (*Carex obnupta*), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), fleshy jaumea (*Jaumea carnosa*), giant rush (*Juncus acutus*), creeping rush (*J. lesueurii*), sea lavender (*Limonium californicum*), coastal silverleaf (*Potenilla anserine*), pickleweed (*Salicornia virginica*), American three-square (*Scirpus americanus*), common three-square (*S. pungens*), and arrowgrass (*Triglochin concinna*) (Sims 2010).

Coastal Dune Scrub. Coastal dune scrub communities are older dune communities with stable and fertile soils, with high organic matter content, high water holding capacity, and low salt content. These communities also have reduced reflectivity and temperature fluctuation of the soil compared to other dune communities, due to more shade and vegetation litter (Holland and Keil 1995). These characteristics result in higher species diversity in these communities when compared to other dune types. Coastal dune scrub communities in Morro Bay make up the dominant habitat type of the Morro Dunes Complex, which runs north to south from Cayucos to Montana de Oro State Park. Coastal dune scrub communities are largely dominated by shrubby vegetation. Common subshrub and shrub species of coastal dune scrub in Morro Bay area include California sagebrush, coyote brush (*Baccharis pilularis*), mock heather (*Ericameria ericoides*), coastal buckwheat (*Eriogonum parvifolium*), coastal golden yarrow (*Eriophyllum staechadifolium*), golden brush (*Isocoma menziesii*), California aster (*Lessingia filaginifolia*), deerweed (*Lotus scoparius*), tree lupine (*Lupinus arboreus*), coastal silver lupine *(L. chamissonis*), and black sage. In addition to these shrubs and subshrubs, many native herbaceous species present in this habitat type include California goosefoot (*Chenopodium californicum*), Blochman's leafy daisy (*Erigeron blochminae*), wallflower (*Erysimum insulare suffrutescens*), California poppy (*Eschscholzia californica*), rush-rose (*Helianthemum scoparium*), horkelia (*Horkelia cuneata*), wild cucumber (*Marah fabaceus*), and Blochman's groundsel (*Senecio blochmaniae*) (Sims 2010).

Mudflats. Mudflat habitats along coastlines occur where the shore is protected from waves. In Morro Bay, mudflats are present in the area of the estuary. The gentle movement of salt water inland and freshwater to these areas brings fine sediments which settle out as mud. At low tide, the intertidal mud is exposed as a mudflat, leaving water only in permanent channels. At high tide, the mudflat is covered with water. The back bay at Morro Bay is a large area of mudflat and coastal salt marsh habitat. If mud has built up above the high tide line, it may be covered with salt marsh habitat. Therefore, herbaceous species common to the coastal salt marsh habitat in Morro Bay are also likely to occur in the mudflat habitats.

Annual Grasslands. This habitat type is composed primarily of nonnative annual herbs and forbs and typically lacks shrub or tree cover. The physical characteristics and species composition of annual grasslands are variable. Common grass species in Morro Bay include wild oats (*Avena* sp.), soft chess brome (*Bromus hordeaceous*), ripgut

brome (*Bromus diandrus*), and red brome (*Bromus madritensis*). Common forb species can include species of filaree (*Erodium* sp.), and bur clover (*Medicago* sp.). California poppy can also be quite common in this habitat type. Annual grassland can correspond to multiple alliances (Sawyer, Keeler-Wolf, and Evens 2009) depending upon the species composition. These alliances can include, but are not limited to, wild oat semi-natural stands and brome (ripgut, red)–purple false brome (*Brachypodium distachyon*) semi-natural stands.

Perennial Grassland. Perennial grassland habitats typically occur in two forms in California: coastal prairie, found in areas of Northern California under maritime influence, and relics in habitats now dominated by annual grasses and forbs. In Morro Bay, perennial grassland habitats are dominated by perennial grass species such as California oatgrass (*Danthonia californica*), purple needlegrass (*Stipa pulchra*), meadow barley (*Hordeum* brachyantherum), and sweet vernalgrass (*Anthoxanthum odoratum*). Perennial grassland habitat typically occurs on ridges and south-facing slopes, alternating with forest and scrub in the valleys and on north-facing slopes. It is found below 3,280 feet in elevation and generally less than 62 miles from the coast. Perennial grassland can correspond to multiple alliances (Sawyer, Keeler-Wolf, and Evens 2009) depending upon the species composition. These alliances can include, but are not limited to, the California Oatgrass Herbaceous Alliance and Purple Needlegrass Herbaceous Alliance.

Pasture. Pasture vegetation is typically a mix of perennial grasses and legumes with complete canopy closure. Structurally this habitat type resembles annual grassland habitats. Vegetation height varies, according to season and livestock stocking levels. Old or poorly drained pastures may have patches of weeds in excess of 2 feet in height. The mix of grasses and legumes varies according to management practices such as seed mixture, fertilization, soil type, irrigation, weed control, and the type of livestock on the pasture.

DEVELOPED AND SPARSELY/NONVEGETATED HABITATS

Developed and sparsely/nonvegetated habitats are abundant in Morro Bay. Developed habitats are usually sparsely or nonvegetated, associated with urban and agricultural

areas, and highly disturbed. Species that occur in these areas are typically adapted to human-caused disturbance and/or composed of ornamental species. Sparsely vegetated habitats also tend to be associated with rock outcrops and cliffs. The following are descriptions of developed and sparsely/nonvegetated habitats that occur within Morro Bay (refer to Figure 9.1).

Agricultural Areas. Vegetation in this habitat includes a variety of sizes, shapes, and growing patterns. Most irrigated row and field crops are grown in rows. Some crops may form 100 percent canopy while others may have significant bare areas between rows. Most crops are annuals, while others, such as asparagus and strawberries, are perennial. Annuals are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops. Winter wheat or barley may sometimes be planted after the harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months), and then harvested in the late spring. Agricultural lands in Morro Bay consist primarily of corn, beans, avocados, and dry farming crops. Hillsides around the city are also utilized for livestock grazing.

Urban. This habitat type is a predominantly man-made habitat comprising residential, commercial, and industrial developed areas, with large developed areas lacking vegetation. Plant species within urban habitats are typically ornamental and other nonnative invasive plant species.

Barren. This habitat type is defined by the absence of vegetation. Any habitat with less than 2 percent total vegetation cover and less than 10 percent cover by tree or shrub species is defined as barren. Structure and composition of barren habitats are largely determined by the region of the state as well as surrounding environment. Examples of barren habitats include areas of exposed parent rock (rock outcrops) and rocky slopes. Due to the inadequacies in nutrient and water content throughout thin layers of soil and the presence of solid or densely packed rock that forms an impenetrable layer for plant roots to grow, rock outcrops often lack much vegetation. In Morro Bay, rock outcrops often coincide with serpentine soils, which further limit certain plant species growth (Sims 2010).

ENVIRONMENTALLY SENSITIVE HABITATS

Section 30107.5 of the Coastal Act defines an environmentally sensitive area or environmentally sensitive habitat area (ESHA) as any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

Section 30121 of the Coastal Act defines a wetland as land within the Coastal Zone that may be covered periodically or permanently with shallow water, which can include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens. Additionally, Section 13577(b) of the California Code of Regulations [14 CCR Section 13577(b)] defines wetlands as lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity, or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats.

In the existing City of Morro Bay Coastal Land Use Plan, the following criteria are used in determining which areas warrant specific protection under the Coastal Act as ESHAs:

1) Unique, rare or fragile communities which should be preserved to ensure their survival in the future;

2) Rare and endangered species habitats that are also protected by state and federal laws;

3) Specialized wildlife habitats which are vital to species survival;

4) Outstanding representative natural communities which have an unusual variety or diversity of plant and animal species;

5) Areas with outstanding educational values that should be protected for scientific research and education uses now and in the future.

Those resources that met one or more of the criteria above have been designated as an ESHA. In the City of Morro Bay, ESHAs have been identified within three primary habitat types: coastal wetlands, coastal streams/ riparian habitats, and rare or unusual native plant communities. Coastal wetlands and coastal streams/riparian habitats are described as follows:

Coastal wetlands:

a. Wetland refers to lands in the coastal zone which may be covered periodically or permanently with shallow water. They include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.

b. An estuary is a coastal water body usually semi-enclosed by land with open, partially obstructed, or intermittent exchange with the ocean whereas ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above the open ocean by evaporation. In general, the boundary between a wetland and an estuary is the line of extreme low water.

c. Open coastal water or coastal waters refer to the open ocean overlying the continental shelf and its associated coastline. Salinities exceed 30 parts per thousand with little or no dilution except at opposite mouths of estuaries.

Coastal streams/riparian habitats:

a. A stream or river is a natural watercourse as designated on the most recently published United States Geological Survey maps, or any well-defined channel with distinguishable bed and bank that shows evidence of having contained flowing water, indicated by scour or deposit of rock, sand, gravel, soil, or debris.

b. A riparian habitat is an area of riparian vegetation. This vegetation is an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of freshwater.

Rare or unusual native plant communities:

a. Rare or unusual native plant communities are the areas in Morro Bay which contain rare and endangered or unique plant communities and provide for

passive and active recreational activities (e.g., hiking, bird watching). These areas are protected and improved as part of the Local Coastal Program process.

The following describes the identified ESHAs in Morro Bay.

Wetlands – Morro Bay and Morro Bay Estuary. The bay consists of a shallow lagoon with two freshwater creeks (Chorro Creek and Los Osos Creek) draining into it. Tidal waters also fill the bay by flowing through the bay entrance and southward. At high tide, the bay contains approximately 2,000 acres of water surface and, at low tide, approximately 500 acres of water surface. The intertidal area is a salt marsh and mudflat. The coastal wetlands, tidal marshes, mudflats, freshwater marshes, and related bodies of water are an important link between the local oceanic and terrestrial ecosystems. The balance between the tidal flushing of the bay and the nutrient-rich freshwater runoff maintains the productivity of these systems. The bay supports several biotic communities, including coastal salt marsh, tidal mudflats, and coastal scrub, which serve as an important link between oceanic and terrestrial ecosystems.

The bay and the estuary serve as a stop on the Pacific Flyway for many migratory birds, including rare and endangered species. The bay also supports a variety of fish species, clams, and oysters, which have become essential to sport and commercial fisheries in Morro Bay. Marine and marsh plants serve as the basic food producers within this ESHA.

Streams. Morro, Chorro, and Los Osos Creeks and various small tributaries serve as important coastal resources in the city. These creeks and tributaries provide habitat for fish and other aquatic organisms, as well as food and shelter for migratory birds and terrestrial organisms. Chorro and Los Osos Creeks drain into the Morro Bay Estuary from the upland areas of a larger watershed, providing substantial habitat in the bay. The freshwater discharged from these creeks into the estuary transport nutrients that serve as an important food source for the entire bay complex. Additionally, the freshwater prevents the bay's salinity from exceeding the tolerance level of many species. The Morro, Chorro, and Los Osos Creeks also provide habitat for steelhead trout and other important commercial and recreational species.

Rare and Endangered Wildlife Habitats – Morro Rock, Fairbanks Point, and Black Hill Natural Area. Morro Rock is located at the mouth of the bay and is the northernmost visible volcanic plug in a chain of plugs extending from Islay Hill in San Luis Obispo. The

ecological preserve on Morro Rock serves as a nesting site for peregrine falcons. The rock is one of the last remaining sites for the falcons and is one of the few nesting sites on the California coast north of the Channel Islands. A grove of eucalyptus trees located at Fairbanks Point, in Morro Bay State Park, serves as a major nesting site for herons. Additionally, the Black Hill natural area, upland from Morro Bay State Park, contains various rare and/or endangered species that are an essential component of the city habitats.

For regulatory purposes, the City maintains a GIS ESHA layer showing the ESHAs identified in the city. However, the layer is considered out of date and site-specific ESHA assessments are typically required for most coastal development permits. In August 2016, the California Coastal Commission approved a request for grant funding for the City to conduct a comprehensive update to its understanding of ESHA boundaries, and to reflect these boundaries in the City's spatial data records. This update process is expected to be completed by December 2016, and will be incorporated into *Plan Morro* Bay.

WETLANDS AND WATER FEATURES

Wetlands and water features include freshwater sloughs, marshes, vernal pools, wet meadows, springs and seeps, portions of lakes, ponds, rivers and streams, and all other areas that are periodically or permanently covered by shallow water, are dominated by hydrophilic vegetation, or have soils that are predominantly hydric in nature. The CWHR system maps three aquatic habitats in Morro Bay: lacustrine, estuarine, and riverine; and two wetland habitats: fresh emergent wetland and saline emergent wetland. Wetlands and water features mapped by the National Wetlands Inventory include estuarine and marine deepwater, estuarine and marine wetland, freshwater emergent wetland, freshwater forested/shrub wetland, freshwater pond, other, and riverine (USFWS 2016b). Wetlands and water features mapped by the CWHR system and the National Wetlands Inventory are described in detail below and shown on Figure 9.2.

Riverine. Riverine systems typically include all wetlands and deep water habitats in natural or artificial channels that contain periodically or continuously flowing water. This system may also form a connecting link between two bodies of standing water. Substrates generally consist of rock, cobble, gravel, or sand. This category also includes

ephemeral and intermittent streams and dry washes, which are common in the Coast Range. Morro Bay supports numerous creeks, drainages, and canals. Drainages that contain water year-round or experience periodic filling and draining provide foraging habitat, breeding habitat, and movement habitat for a variety of aquatic animals and a number of special-status species.

Lacustrine. Lacustrine habitats are inland depressions or dammed riverine channels containing standing water. They may vary from small ponds less than 1 hectare to large areas covering several square kilometers. Depth can vary from a few centimeters to hundreds of meters. Typical lacustrine habitats in Morro Bay include ponds so shallow that rooted plants can grow over the bottom. Most permanent lacustrine systems support fish life while intermittent lacustrine systems usually do not.

Estuarine. Estuarine habitats typically occur on periodically and permanently flooded substrates and open water portions of semi-enclosed coastal waters where tidal seawater is diluted by flowing freshwater. This mix of fresh and ocean waters usually forms a horizontal salinity gradient that varies by area and location with seasonal variations in freshwater inflow and tidal action. The estuarine habitat identified in Morro Bay is typical of the estuarine habitats in California, which include coastal lagoons containing waters of more uniform salinity than true estuaries, or waters with vertical rather than horizontal salinity gradients. Estuarine habitat covers the entirety of the Morro Bay Estuary, from near the Morro Bay State Park Museum of Natural History to the southern border of the estuary. The estuarine habitats in Morro Bay intergrade with coastal salt marsh communities and occur in coastal portions of Chorro and Los Osos Creeks as well as various streams and tributaries between them.

Saline Emergent Wetlands. Saline emergent wetlands are typically characterized as salt or brackish marshes consisting mostly of perennial grasses and herbs, including succulents, ranging in height from 0.2 meter to 2 meters (0.7–6.6 feet) or more, along with algal mats on moist soils and at the base of vascular plant stems. The component plants occur sometimes in zones but more often in patches or as a sequence of overlapping species along an elevational gradient. Vegetation coverage is complete or nearly so, except where creeks and ponds are present or following disturbance. Vertical stratification occurs in all but the lower, outer zone.

Estuarine and Marine Deepwater. Deepwater wetlands are typically composed of estuarine or marine systems. Estuarine systems are composed of tidal habitats and

adjacent tidal wetlands that are influenced by water runoff from, and often semi-enclosed by, land. They are located along low-energy coastlines and have variable salinity. Marine systems of this type are generally open ocean and occur along high energy coastlines with salinities exceeding 30 parts per thousand with little or no dilution except outside the mouths of estuaries.

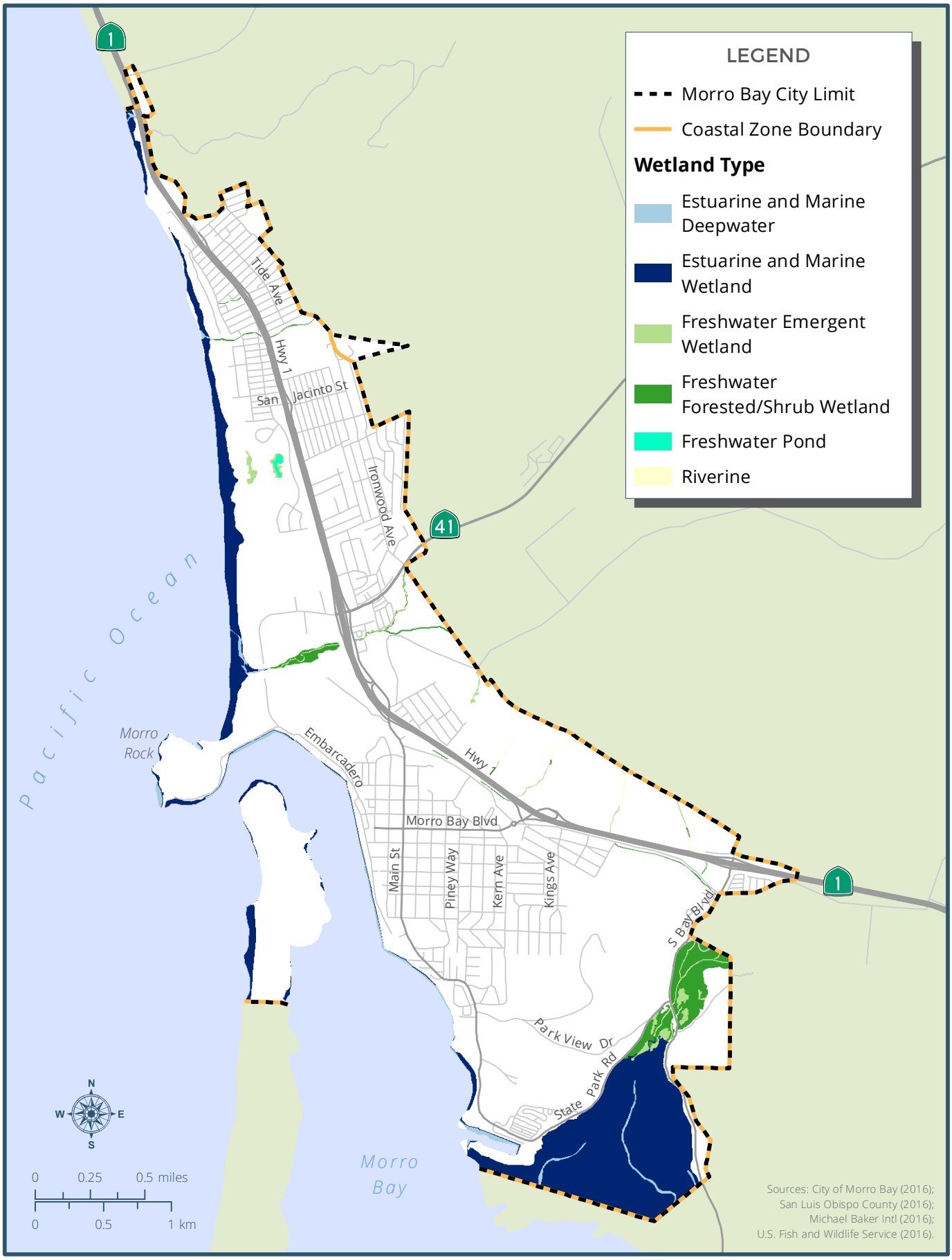

FIGURE 9.2

Wetlands and Drainages in Morro Bay

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Estuarine and Marine Wetlands. Estuarine and marine wetlands are composed of estuarine and marine systems as described above; however, they are not deepwater, as described in the preceding paragraph. These areas can be subtidal or intertidal with a variety of vegetated and nonvegetated bottoms. Beaches, bars, and flats are also included in this category.

Freshwater Emergent Wetlands. Freshwater emergent wetlands typically include all nontidal waters dominated by emergent herbaceous plant species, mosses, and/or lichens.

Freshwater Forested/Shrub Wetlands. Freshwater forested/shrub wetlands typically include nontidal waters that are dominated by trees and shrubs, with emergent herbaceous plants, mosses, and/or lichens. Wetlands that lack vegetation can be included in this class if they also exhibit the same criteria as described for freshwater emergent wetlands. The vegetation found in freshwater forested/shrub wetlands is generally dominated by woody vegetation such as shrubs and trees.

Freshwater Ponds. Freshwater ponds typically include nontidal waters with vegetative cover along their edges, such as trees, shrubs, emergent herbaceous plants, mosses, and/or lichens. Freshwater ponds can be man-made or natural and typically consist of an area of standing water with variable amounts of shoreline. These wetlands and deepwater habitats are dominated by plants that grow on or below the surface of the water. Freshwater ponds provide important breeding habitat for special-status species such as California red-legged frog (*Rana draytonii*) and western pond turtle (*Emys marmorata*).

Other. Other wetland systems identified in Morro Bay are generally categorized as palustrine systems contained within the wetland categories described above. Palustrine systems include all nontidal wetlands dominated by trees, shrubs, emergent, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand.

MARINE RESOURCES

Morro Bay and the Morro Bay Estuary contain a variety of biotic communities which support migratory birds, fish, and oysters, which are essential to maintaining oceanic and terrestrial ecosystems as well as local sport and commercial fisheries. Morro Bay and the Morro Bay Estuary are important to the health of the city's aesthetic and recreational value as well as the commercial fishing and sport fishing industries, mariculture and marine research activities, and harbor and navigational ways.

SPECIAL-STATUS SPECIES

Special-status species include those species that are listed as rare, threatened, or endangered by the CDFW or the USFWS, or are candidates for either state or federal listing, or have been designated as "fully protected" or "species of special concern" by USFWS and CDFW, or are other species that are tracked by the CNPS or the California Natural Diversity Database (CNDDB), but do not fall into any of the categories cited above.

Woodlands, shrub, and herbaceous dominated habitats, wetlands, and aquatic habitats are home to most of the city's special-status plant and animal species. These habitat types have the highest conservation value for preservation of rare species. Most listed and special-status species have specific habitat and microhabitat conditions, and would not generally be expected to occur outside of areas that meet those specific habitat criteria; however, a number of listed and otherwise protected species have the potential to occur in a wide range of habitats, including disturbed and developed areas. A number of bird species protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code can nest in highly disturbed areas and in ornamental trees adjacent to developed areas.

Table 9.1 through 9.4 present a comprehensive list of special-status species known to occur, or with potential to occur, in Morro Bay. These species are also mapped on Figure 9.3. The information is based on queries of several relevant databases that contain information about occurrences of sensitive biological resources for the city. These include the CNDDB (CDFW 2016b); the Biogeographic Information and Observation System (BIOS; CDFW 2016a); USFWS Critical Habitat Portal (2016c); IPaC (USFWS 2016a); and the CNPS Online Inventory of Rare and Endangered Plants of California (CNPS 2016).

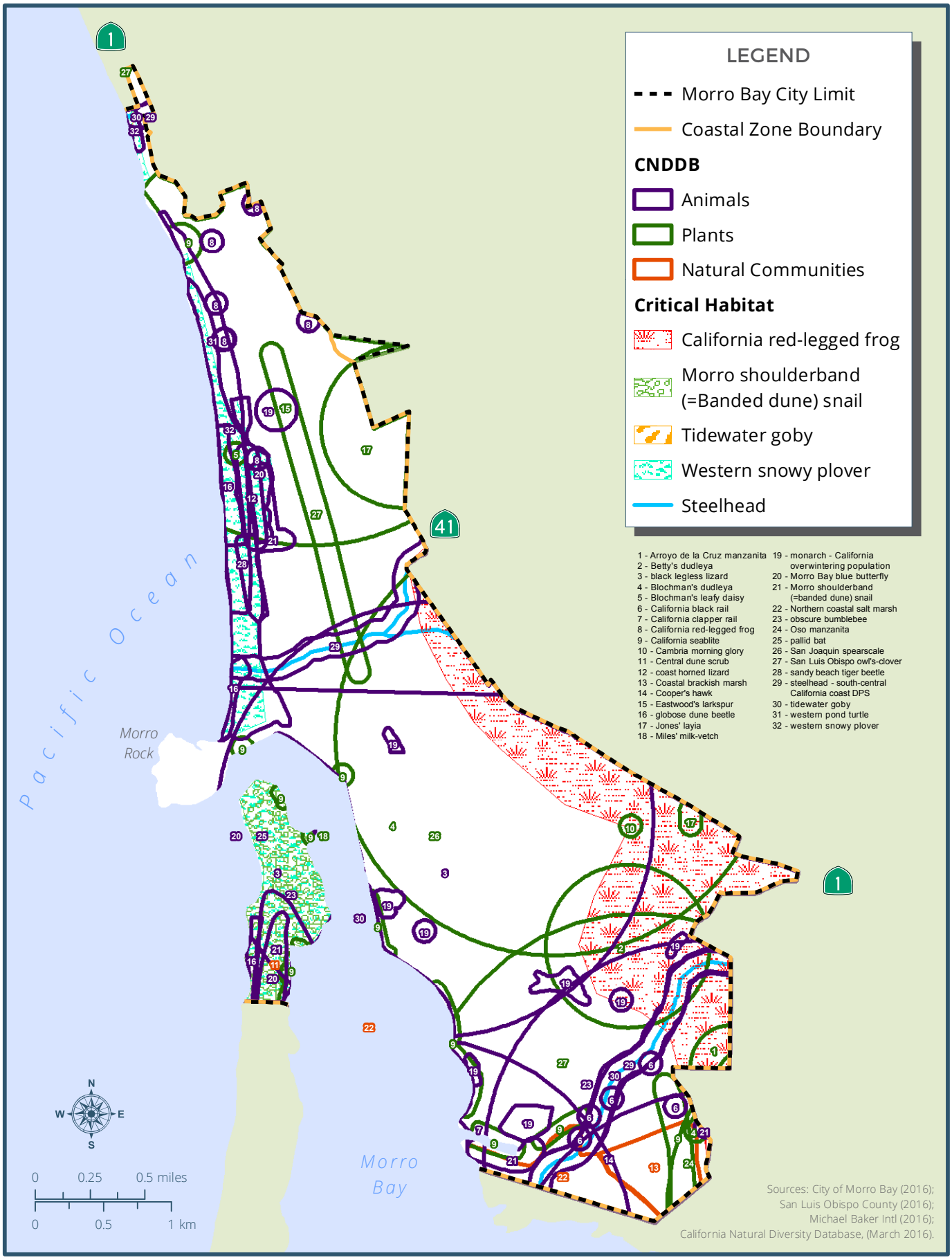

FIGURE 9.3

Species Occurrences and Critical Habitat Identified by the CNDDB

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Table 9.1
Federal- and/or State-Listed Special-Status Plant Species Documented in or with the Potential to Occur in Morro Bay

Common Name	Scientific Name	Federal/State Status	CA Rare Plant Rank
San Luis Obispo fountain thistle	*Cirsium fontinale var. obispoense*	FE/SE	1B.2
California seablite	*Suaeda californica*	FE	1B.1
Morro manzanita	*Arctostaphylos morroensis*	FT	1B.1
marsh sandwort	*Arenaria paludicola*	FE/SE	1B.1
salt marsh bird's-beak	*Chloropyron maritimum ssp. maritimum*	FE/SE	1B.2
Surf thistle	*Cirsium rhothophilum*	ST	1B.2
beach spectaclepod	*Dithyrea maritima*	ST	1B.1
Indian Knob mountainbalm	*Eriodictyon altissimum*	FE/SE	1B.1
adobe sanicle	*Sanicula maritima*	SR	1B.1
California jewelflower	*Caulanthus californicus*	FE	1B.1
Spreading navarretia	*Navarretia fossalis*	FT	1B.1

FT: Federally threatened

FE: Federally endangered

ST: State threatened

SE: State endangered

SR: State rare

Table 9.2
NonListed Special-Status Plant Species Documented in or with the Potential to Occur in Morro Bay

Common Name	Scientific Name	CA Rare Plant Rank
Miles' milk-vetch	*Astragalus didymocarpus var. milesianus*	1B.2
San Luis Obispo owl's-clover	*Castilleja densiflora var. obispoensis*	1B.2
Brewer's spineflower	*Chorizanthe breweri*	1B.3
Eastwood's larkspur	*Delphinium parryi ssp. eastwoodiae*	1B.2
umbrella larkspur	*Delphinium umbraculorum*	1B.3
Betty's dudleya	*Dudleya abramsii ssp. bettinae*	1B.2
Blochman's dudleya	*Dudleya blochmaniae ssp. blochmaniae*	1B.1
Blochman's leafy daisy	*Erigeron blochmaniae*	1B.2
Ojai fritillary	*Fritillaria ojaiensis*	1B.2
San Benito fritillary	*Fritillaria viridea*	1B.2
Jones' layia	*Layia jonesii*	1B.2
Santa Lucia bush-mallow	*Malacothamnus palmeri var. palmeri*	1B.2
Arroyo de la Cruz manzanita	*Arctostaphylos cruzensis*	1B.2
Santa Lucia manzanita	*Arctostaphylos Luciana*	1B.2

Common Name	Scientific Name	CA Rare Plant Rank
Oso manzanita	*Arctostaphylos osoensis*	1B.2
Pecho manzanita	*Arctostaphylos pechoensis*	1B.2
dacite manzanita	*Arctostaphylos tomentosa ssp. daciticola*	1B.1
twisted horsehair lichen	*Bryoria spiralifera*	1B.1
San Luis mariposa lily	*Calochortus obispoensis*	1B.2
Hardham's evening-primrose	*Camissoniopsis hardhamiae*	1B.2
San Luis Obispo sedge	*Carex obispoensis*	1B.2
coastal goosefoot	*Chenopodium littoreum*	1B.2
dwarf soaproot	*Chlorogalum pomeridianum var. minus*	1B.2
popcorn lichen	*Cladonia firma*	2B.1
mouse-gray dudleya	*Dudleya abramsii ssp. murina*	1B.3
Hoover's button-celery	*Eryngium aristulatum var. hooveri*	1B.1
San Joaquin spearscale	*Extriplex joaquinana*	1B.2
mesa horkelia	*Horkelia cuneata var. puberula*	1B.1
Kellogg's horkelia	*Horkelia cuneata var. sericea*	1B.1
Coulter's goldfields	*Lasthenia glabrata ssp. coulteri*	1B.1
Palmer's monardella	*Monardella palmeri*	1B.2
southern curly-leaved monardella	*Monardella sinuata ssp. sinuate*	1B.2
San Luis Obispo monardella	*Monardella undulata ssp. undulata*	1B.2
coast woolly-heads	*Nemacaulis denudata var. denudate*	1B.2
Diablo Canyon blue grass	*Poa diabolic*	1B.2
most beautiful jewelflower	*Streptanthus albidus ssp. peramoenus*	1B.2
splitting yarn lichen	*Sulcaria isidiifera*	1B.1

Table 9.3
Federal- or State-Listed Animal Species Documented in or with the Potential to Occur in Morro Bay

Common Name	Scientific Name	Federal/State Status
California clapper rail	*Rallus longirostris obsoletus*	FE/SE/FP
steelhead - south-central California coast DPS	*Oncorhynchus mykiss irideus*	FT
Morro shoulderband (=banded dune) snail	*Helminthoglypta walkeriana*	FE
tidewater goby	*Eucyclogobius newberryi*	FE
western snowy plover	*Charadrius alexandrinus nivosus*	FT
California black rail	*Laterallus jamaicensis coturniculus*	ST/FP
California red-legged frog	*Rana draytonii*	FT
California condor	*Gymnogyps californianus*	FE/FP
California least tern	*Sterna antillarum browni*	FE/FP
Least bell's vireo	*Vireo bellii pusillus*	FE
Marbled murrelet	*Brachyramphus marmoratus*	FT
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	FE
Southern sea otter	*Enhydra lutris nereis*	FT/FP

FT: Federally threatened

FE: Federally endangered

FP: Fully protected

SE: State endangered

ST: State threatened

Table 9.4
Nonlisted Special-Status Animal Species Documented in or with the Potential to Occur in Morro Bay

Common Name	Scientific Name	Federal/State Status
black legless lizard	*Anniella pulchra nigra*	SSC
pallid bat	*Antrozous pallidus*	SSC
Cooper's hawk	*Accipiter cooperii*	WL
Blainville's horned lizard horned lizard	*Phrynosoma blainvillii*	SSC
Southern western pond turtle	*Actinemys (=Emys) pallida*	SSC

SSC: State species of special concern

WL: State watch list

SENSITIVE PLANT COMMUNITIES

The CNDDB lists three sensitive natural communities in Morro Bay (refer to Table 9.5). The Sensitive Natural Communities list in the CNDDB is not currently maintained, and no new information has been added. Therefore, vegetation types on-site were also compared with the List of Vegetation Alliances and Associations (CDFW 2010). According to the CDFW's Vegetation Program, Alliances with State ranks of S1-S3 are considered to be imperiled, and thus, potentially of special concern.

Table 9.5
Sensitive Natural Communities identified by the CNDDB

Natural Community	G-Rank/S-Rank
Northern coastal salt marsh	G3/S3.2
Central dune scrub	G2/S2.2
Coastal brackish marsh	G2/S2.1

G-Rank/S-Rank = Global Rank and State Rank as per CDFW's CNDDB RareFind5

CRITICAL HABITAT

Critical habitat is a term used in the federal Endangered Species Act (ESA) and defined as a specific geographic area (or areas) that contain features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as "critical habitat" after the USFWS publishes a proposed federal regulation in the Federal Register and then receives and considers public comments on the proposal. The final boundaries of the critical habitat area, once identified, are published in the Federal Register.

The City of Morro Bay provides designated critical habitat for Western snowy plover, steelhead, Morro shoulderband (=Banded dune) snail, tidewater goby, and California red-legged frog. These critical habitats are shown on Figure 9.3.

WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

Habitats within a linkage are not necessarily the same as the habitats being linked. Rather, the linkage need only contain sufficient cover and forage to allow temporary use by a species during periods of movement between or among larger areas of suitable habitat. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending on the species, a linkage may require specific minimum physical characteristics (e.g., rock outcroppings, vernal pools, specific vegetation cover) to function as an effective wildlife corridor, and allow those species to traverse the linkage. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a relatively short period of time.

The California Essential Habitat Connectivity Project: A Strategy for Conserving Connected California (Spencer et al. 2010) and Penrod et al. (2010) have all evaluated critical wildlife movement corridors throughout California that have been identified as priority areas for conservation. Essential Connectivity Areas (ECAs) represent the most critical wildlife movement areas for long-term conservation of California's sensitive wildlife species; however, it should be noted that ECAs do not represent an exhaustive list of movement corridors in the state. ECAs are large, continuous areas, and individual ECAs may overlap one another without clearly defined boundaries. A single ECA covers the majority of the city and is shown in Figure 9.4. Additionally, the creeks and riparian areas mapped on Figure 9.2 may serve as small-scale wildlife corridors in the city.

9.2 REGULATORY SETTING

FEDERAL

Federal Endangered Species Act. The USFWS and the National Marine Fisheries Service (NMFS) administer the ESA. The ESA requires each agency to maintain lists of imperiled native species and affords substantial protections to these listed species. The jurisdiction of the NMFS under the ESA is limited to the protection of marine mammals, marine fishes, and anadromous fish. All other species are subject to USFWS jurisdiction.

The USFWS and NMFS may list a species if it is endangered (at risk of extinction in all or a significant portion of its range) or threatened (likely to become endangered in the foreseeable future). Section 9 of the ESA prohibits the take of any wildlife species listed as endangered and most species listed as threatened. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

The ESA includes exceptions that allow an action to be carried out, despite the fact that the action may result in the take of a listed species, where conservation measures are included for the species. Section 7 of the ESA provides an exception for actions authorized (e.g., under a Section 404 permit), funded, or carried out by a federal agency, and Section 10 provides an exception for actions that do not involve a federal agency.

Clean Water Act, Section 404 – Programmatic General Permit for Wetland Fill. The Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's waters, including wetlands, lakes, rivers, and coastal areas. Section 404 of the CWA regulates the discharge of dredged or fill material into the waters of the United States, including wetlands. The CWA holds that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; issuance of such permits constitutes its principal regulatory tool.

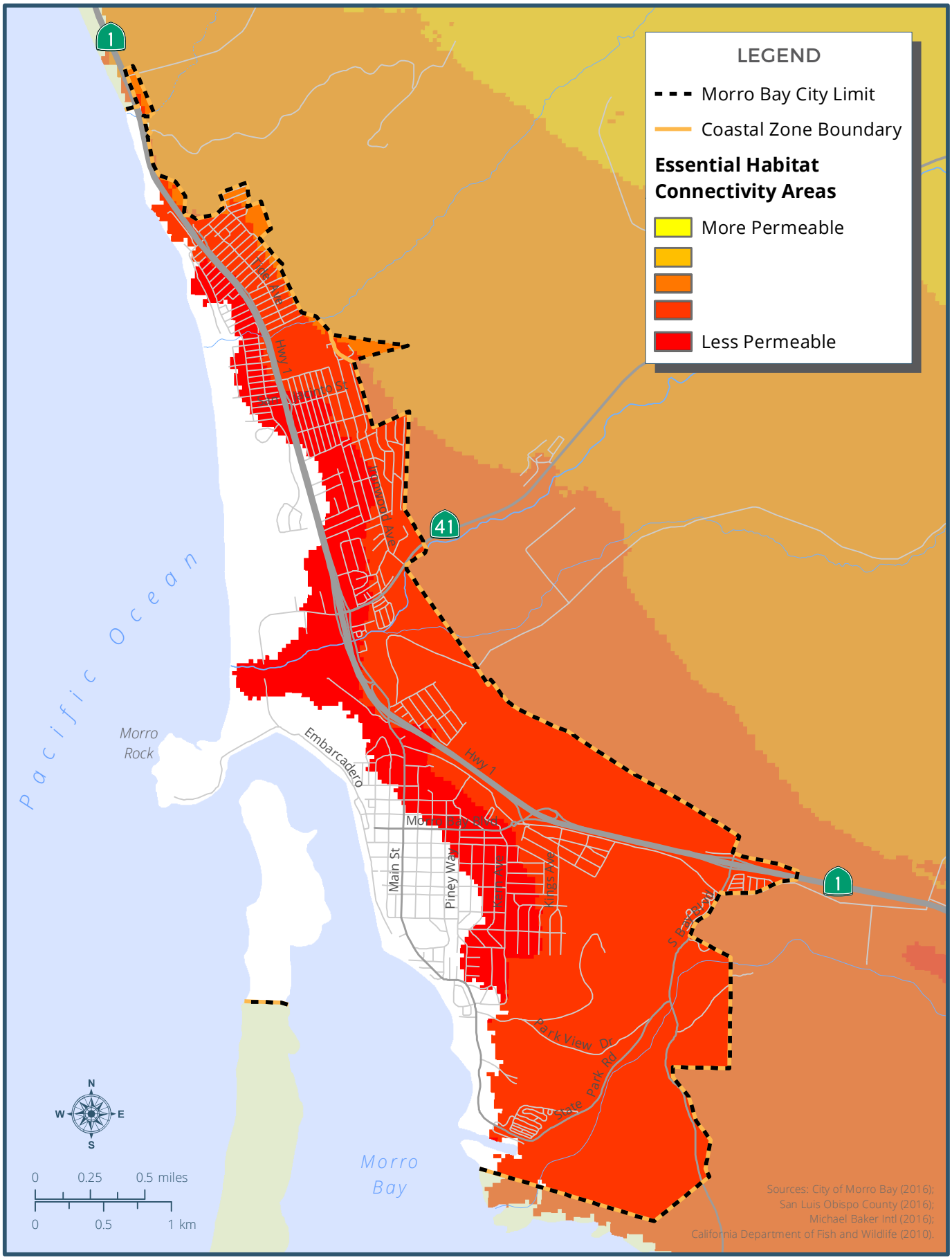

FIGURE 9.4

Essential Connectivity Areas in Morro Bay

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The US Army Corps of Engineers (USACE) is authorized to issue Section 404 permits, which allow the placement of dredged or fill materials into jurisdictional waters of the United States under certain circumstances. The USACE issues two types of permits under Section 404: general permits (either nationwide permits or regional permits) and standard permits (either letters of permission or individual permits). General permits are issued by the USACE to streamline the Section 404 permitting process for statewide or regional activities that have minimal direct or cumulative environmental impacts on the aquatic environment. Standard permits are issued for activities that do not qualify for a general permit (i.e., that may have more than a minimal adverse environmental impact).

Clean Water Act, Section 401 – Programmatic Water Quality Certification. Under the CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401 and the state's Porter-Cologne Water Quality Control Act. In California, Section 401 certification is handled by the Regional Water Quality Control Boards (RWQCBs). Morro Bay is under the jurisdiction of the Central Coast RWQCB, which is responsible for implementation of state and federal water quality protection guidelines. The Central Coast RWQCB implements the Water Quality Control Plan for the Central Coast Basin, a master policy document for managing water quality issues in the region.

Migratory Bird Treaty Act. The MBTA (1918), as amended, implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the MBTA, taking, killing, or possessing migratory birds is unlawful, as is taking of any parts, nests, or eggs of such birds (16 U.S. Government Code 703). Take is defined more narrowly under the MBTA than under ESA and includes only the death or injury of individuals of a migratory bird species or their eggs. As such, take under the MBTA does not include the concepts of harm and harassment as defined under ESA.

Marine Protection, Research and Sanctuaries Act. On October 23, 1972, Congress passed the Marine Protection, Research and Sanctuaries Act, establishing marine sanctuaries in the United States under the National Marine Sanctuaries Program (NMSP). The

NMSP, a division of the National Oceanic and Atmospheric Administration, currently administers 13 national marine sanctuaries. Under the NMSP, a National Marine Sanctuary is a federally designated area within United States waters that protects areas of the marine environment with special conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and/or aesthetic qualities. A proposal has been submitted to officially designate the California Central Coast Chumash Heritage National Marine Sanctuary. The proposed sanctuary would be located along the south Central California coastline, from Gaviota Creek in Santa Barbara to Santa Rosa Creek in Cambria. The western boundary of the sanctuary would be west of the submerged Santa Lucia Bank along the Santa Lucia Escarpment. The eastern boundary would be the mean high tide line. These coastal waters included in the proposal are between the designated Channel Islands and the Monterey Bay National Marine Sanctuaries. The Morro Bay Estuary and Morro Rock state landmark would be located along the coast of the proposed sanctuary.

STATE

California Endangered Species Act. Administered by the CDFW, the California Endangered Species Act (CESA) prohibits the take of listed species and species formally under consideration for listing ("candidate" species) in California. CESA defines take as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (Fish and Game Code Section 86). Under this definition, and in contrast to ESA, CESA does not prohibit harm to a listed species. Furthermore, take under CESA does not include "the taking of habitat alone or the impacts of the taking." However, the killing of a listed species that is incidental to an otherwise lawful activity and not the primary purpose of the activity constitutes a take under CESA. CESA does not protect insects, but with certain exceptions prohibits the take of plants on private land.

California Fish and Game Code, Section 1600-1616 – Master Streambed Alteration Agreement for Streambed Modifications. The CDFW has jurisdictional authority over streams, lakes, and wetland resources associated with these aquatic systems under California Fish and Game Code Section 1600 et seq. The CDFW has the authority to regulate work that will "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris waste or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or

lake" (Fish and Game Code Section 1602). An entity that proposes to carry out such an activity must first inform the CDFW, and where the CDFW concludes that the activity will "substantially adversely affect an existing fish or wildlife resource," the entity proposing the activity must negotiate an agreement with the CDFW that specifies terms under which the activity may be carried out in a way that protects the affected wildlife resource.

California Fish and Game Code 3503 (Bird Nests). Section 3503 of the California Fish and Game Code makes it "unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." The CDFW may issue permits authorizing take.

California Fish and Game Code 3503.5 (Birds of Prey). Section 3503.5 of the California Fish and Game Code prohibits the take, possession, or destruction of any birds of prey or their nests or eggs "except as otherwise provided by this code or any regulation adopted pursuant thereto." The CDFW may issue permits authorizing take of birds of prey or their nests or eggs pursuant to CESA or the Natural Community Conservation Planning Act.

California Coastal Act. The Coastal Act outlines standards for development within the Coastal Zone and includes specific policies (see Division 20 of the Public Resources Code) that address issues such as terrestrial and marine habitat protection, commercial fisheries, and water quality. The Coastal Zone encompasses 1.5 million acres of land, and stretches from 3 miles at sea to an inland boundary that varies from several blocks in urban areas to as much as 5 miles in less developed areas. The City of Morro Bay is entirely within the Coastal Zone. The Coastal Zone extends into federal waters under the federal Coastal Zone Management Act.

Chapter 3 of the Coastal Act contains the standards used by the California Coastal Commission in the review of coastal development permits and local coastal plans (LCP). The chapter's seven articles govern all development along the coast, and mandate protection of public access, recreational opportunities, and marine and land resources. Chapter 3, Article 4 addresses protection of the marine environment including water quality issues, wetlands protections, and coastal armoring. Chapter 3, Article 5 includes protections for environmentally sensitive habitat, agriculture, and archeological resources.

California Marine Life Protection Act. The Marine Life Protection Act (1999) aims to protect California's marine natural heritage through establishing a statewide network of marine protected areas. Title 14 CCR Section 632 provides the regulatory requirements for marine protected areas (MPAs), marine managed areas (MMAs), and special closures and states that "public use of marine protected areas, marine managed areas, or special closures shall be compatible with the primary purposes of such areas. MPAs, MMAs, and special closures are subject to general rules and regulations in addition to existing Fish and Game Code statutes and regulations of the commission, except as otherwise provided for in subsection 632(b), areas and special regulations for use."

The City of Morro Bay contains a State Marine Reserve marine protected area and a State Marine Recreational Management Area marine protected area, both of which are subject to the special regulations for use included in Title 14 CCR Sections 632(b)(91) and 632(b)(92) (CDFW 2016c).

LOCAL

City of Morro Bay General Plan/Local Coastal Plan. The existing Morro Bay General Plan was adopted in 1988. Volume I of the General Plan includes all of the policies and programs in the Land Use Plan as well as pertinent and current policies from the 10 original General Plan elements. Volume II of the General Plan consists of the entire LCP in its certified form. If any inadvertent discrepancies in Volume I of the General Plan are discovered, the corresponding LCP language of Volume II will automatically prevail in intent and meaning. The General Plan and LCP include a number of policies aimed at protecting the resources in the city. Policies LU-50 through LU-62, as well as policies LU-64 through LU-77, include measures to protect the environmental resources and guide actions which affect those resources in the city. Additionally, policies 11.01-11.23 of the LCP specify measures to protect and manage ESHAs identified in the city (City of Morro Bay 1988).

Morro Bay National Estuary Program. The Morro Bay National Estuary Program is a nonregulatory, nonprofit organization which works with local residents, governments, nonprofits, agencies, and landowners to protect and restore the Morro Bay Estuary. Morro Bay was designated a state estuary in 1994 and an "estuary of national significance" in 1995. The Morro Bay National Estuary Program is one of 28 National

Estuary Programs around the country working to protect and improve the health of the nation's most important coastal waters. The Morro Bay National Estuary Program is locally managed, but is recognized by the United States Environmental Protection Agency, which provides some financial and technical support to each National Estuary Program.

9.3 PRIORITY FINDINGS

ENVIRONMENTALLY SENSITIVE HABITAT AREAS

ESHAs have been identified in three primary habitat types in the City of Morro Bay: coastal wetlands, coastal streams/riparian habitats, and rare or unusual native plant communities. The ESHAs identified in the city include Morro Bay and Morro Bay Estuary, various creeks and small tributaries, and Morro Rock, Fairbanks Point, and Black Hill Natural Area. However, the City's GIS layer showing the ESHAs identified in the city is out of date. As part of the process to update the General Plan and Local Coastal Plan, the City's ESHA GIS layer should be updated to include the habitats that currently exist in the City of Morro Bay.

MARINE RESERVES

The City of Morro Bay contains both a State Marine Reserve marine protected area and a State Marine Recreational Management Area marine protected area (CDFW 2016c).

MORRO BAY AND MORRO BAY ESTUARY

Morro Bay and the Morro Bay Estuary comprise the main wetlands area of the City of Morro Bay. At high tide, the bay contains approximately 2,000 acres of water surface and, at low tide, approximately 500 acres of water surface. The bay supports several biotic communities, including coastal salt marsh, tidal mudflats, and coastal scrub, which serve as an important link between oceanic and terrestrial ecosystems. The bay and the estuary also support many migratory birds, as well as a variety of fish species, clams, and oysters.

SPECIAL-STATUS SPECIES

The CNDDB, CNPS, and the USFWS databases document 48 special-status plant species and 20 special-status animal species with records in the City of Morro Bay. Eleven of the documented 48 special-status plants are included on state and/or federal threatened or endangered species lists. Fifteen of the 20 special-status animal species are state and/or federally listed as threatened or endangered. While all special-status plants and animals are protected under the California Environmental Quality Act, state and federally listed species have greater legal protection and often require special permitting to ensure impacts to these species are not significant.

CRITICAL HABITAT

Morro Bay contains designated critical habitat areas for Western snowy plover, steelhead, Morro shoulderband (=Banded dune) snail, tidewater goby, and California red-legged frog.

Morro Bay includes several habitat areas of importance, including oak woodlands, riparian woodlands, chaparral, grassland, and aquatic habitats, which are home to the majority of the special-status plant and animal species that occur in the city. Some of these communities are considered sensitive by the CDFW and are protected as such.

WATERWAYS AND WETLANDS

Numerous waterways and wetland areas in Morro Bay provide habitat for special-status species, and are considered waters of the United States or waters of the state. These fall under the jurisdiction of the USACE, CDFW, and/or the RWQCB. Features that fall under the jurisdiction of the above-listed agencies include various creeks, freshwater and saline emergent wetlands, and estuarine and marine deepwaters and wetlands.

HABITAT CONNECTIVITY

The majority of Morro Bay falls within a single ECA, as documented by the California Essential Habitat Connectivity Project (Spencer et al. 2010). Additionally, many other

natural areas in the county, such as riparian corridors, could function as important local wildlife movement corridors.

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10.0 NOISE

Plan MORRO BAY

10.0 NOISE

This chapter identifies existing noise conditions in the planning area. This chapter also summarizes applicable regulations for noise and vibration.

10.1 EXISTING CONDITIONS

FUNDAMENTALS OF NOISE

To understand how noise and vibration occur in the planning area, it is important to first understand how noise and vibration are measured. This section provides an overview of the units used to measure noise and vibration.

Noise

Decibels (dBA)

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

Sound pressure level is measured on a logarithmic scale with the 0 dBA level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1 to 2 dBA changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40 to 50 dBA, while arterial streets are in the 50 to 60+ dBA range. Normal conversational levels are in the 60 to 65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels typically drop off at a rate of 6 dBA per doubling of distance from point sources (such as industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. Standard new residential construction typically provides a reduction of exterior-to-interior noise levels of 25 dBA or more with windows closed (FTA 2006).

Equivalent Noise Level (Leq)

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level).

Other Noise Measurement Units

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than noise that occurs during the day. Community noise is usually measured using day-night average level (Ldn), which is the 24-hour average noise level with a 10 dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dBA.

Vibration

Vibration Decibels (VdB)

Vibration is a unique form of noise because its energy is carried through buildings, structures, and the ground, whereas noise is simply carried through the air. Thus, vibration is generally felt rather than heard. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB) in the United States.

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA 2006). In terms of groundborne vibration impacts on structures, the Federal Transit Administration (FTA) states that groundborne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. Most perceptible indoor vibration is caused by sources within buildings such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible.

The general human response to different levels of groundborne vibration velocity levels is described in Table 10.1.

Table 10.1
Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find vibration at this level annoying.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: FTA 2006

NOISE CONDITIONS IN MORRO BAY

In general, the City of Morro Bay is a relatively quiet environment. Roadway traffic from Highway 1, Highway 41, Morro Bay Boulevard, Main Street, Embarcadero, and South Bay Boulevard is the most pervasive source of noise in the city. Other sources of noise include pedestrians, commercial activities (e.g., buildings with HVAC units and automotive repair shop operations), school functions (e.g., high school sporting events), and sounds associated with the coastal setting (e.g., ocean waves and faunal activity).

To determine existing noise levels in the city, 15-minute sound level measurements were taken on a weekday near major roadways and typical land uses in the city, as shown on Figure 10.1. The measurements were collected on April 6, 2016, using an ANSI Type II integrating sound level meter. These sound level measurements provide existing ambient sound levels throughout the city. Table 10.2 identifies the measured noise levels.

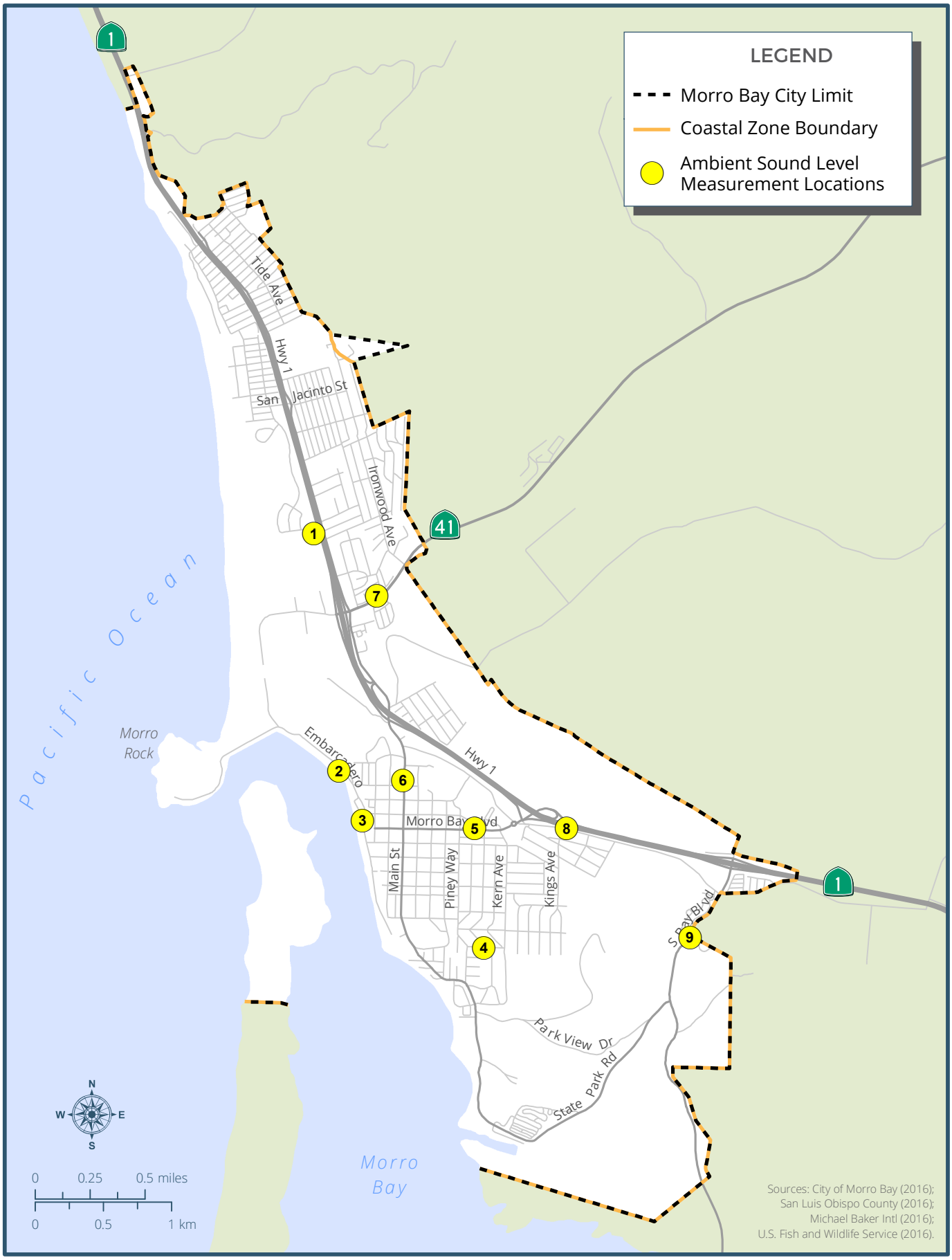

FIGURE 10.1

Ambient Sound Level Measurement Locations

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Table 10.2
Ambient Sound Level measurements in the City

Measurement Number	Location and Time	Noise Source	Distance from Primary Noise Source (feet)	Leq[15] (dBA)
1	Highway 1, west side of highway, approximately 80 feet north of Morro Bay High School, 12:54 p.m.	*Primary* – roadway traffic *Secondary* – aircraft flyover, bicycle and pedestrian path activity	150	60.4
2	Morro Bay Harbor, south end of parking lot across from boat docking area, 1:20 p.m.	*Primary* – harbor and commercial operations *Secondary* – Embarcadero roadway, parking lot noise	100	55.4
3	Embarcadero commercial area, 140 feet south of Harbor Street intersection, 1:46 p.m.	*Primary* – pedestrian and commercial activity *Secondary* – Embarcadero roadway	50	54.3
4	Corner of Luisita Street and Bernardo Avenue, 2:17 p.m.	*Primary* – residential commercial activity, Luisita Street traffic	15	50.7
5	Morro Bay Boulevard, at Morro Bay Park, 2:45 p.m.	*Primary* – roadway traffic *Secondary* – fire engine sirens, pedestrian activity	30	63.2
6	Main Street, 130 feet north of Beach Street intersection, 3:09 p.m.	*Primary* – roadway traffic *Secondary* – Beach Street traffic	35	67.6
7	Highway 41, 145 feet west of Hill Street intersection, 3:34 p.m.	*Primary* – roadway traffic	40	67.6
8	Highway 1, along Quintana Road 110 feet east of Kings Avenue, 3:59 p.m.	*Primary* – roadway traffic *Secondary* – Quintana Road traffic	75	71.1
9	South Bay Boulevard, 0.25 mile south of Quintana Road intersection, 4:22 p.m.	*Primary* – roadway traffic	20	72.0

Note: Field visit on April 6, 2016, using ANSI Type II integrating sound level meter.

See Figure 10.1 for noise measurement locations.

See Appendix C for noise monitoring data sheets.

As shown in Table 10.2, the ambient sound levels at major roadways and land uses in the City of Morro Bay range from approximately 51 to 72 dBA. Measurement locations 8 and 9 had the highest ambient sound levels due to high levels of roadway traffic during the afternoon peak period, during which these measurements were recorded. The lowest ambient sound levels were recorded in the commercial and residential areas of the city.

Using the 2016 average daily traffic volumes from the project traffic study, prepared by Central Coast Transportation Consulting, noise levels along area roadways were also estimated using the US Department of Housing and Urban Development (HUD) Day/Night Noise Level (DNL) Calculator. The HUD DNL calculator is an online assessment tool that calculates the Ldn, or 24-hour average noise level, from roadway traffic. The HUD DNL calculator only estimates noise levels generated from traffic and does not account for other factors that may affect ambient noise levels, such as intervening structures and topography, which attenuate noise. Accordingly, the HUD DNL calculator often overestimates ambient noise in comparison to measured ambient noise levels. The HUD DNL calculator results are shown in Table 10.3 and existing noise contours along the major roadways in the city are shown on Figure 10.2.

Table 10.3
Modeled Noise Levels Along Major Roadways in the City

Roadway Segment	Modeled Noise Level at 50 feet (dBA Ldn)
Embarcadero - North of Beach Street	66.2
Embarcadero - North of Pacific Street	63.2
Embarcadero - South of Pacific Street	62.5
Morro Bay Boulevard - West of Quintana Road	69.7
Main Street - South of Radcliff Drive	68.1
Highway 41 - East of Main Street	69.9
Highway 1 - South of State Route 41	76.7
Highway 1 - North of State Route 41	75.7

Source: HUD DNL Calculator, 2016, included in Appendix C

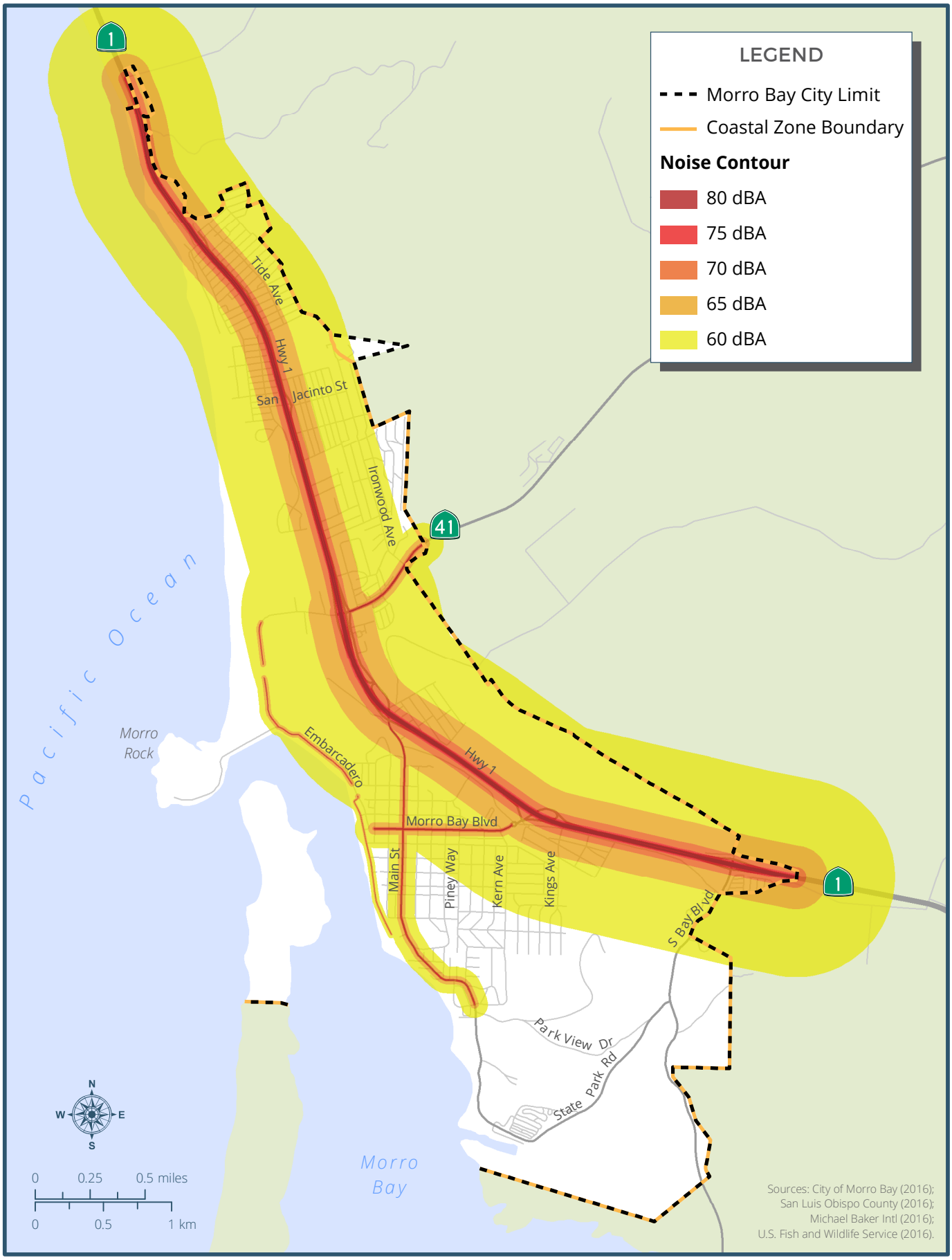

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FIGURE 10.2

Existing Noise Contours

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As shown in Table 10.3, the estimated noise levels at 50 feet from major roadways within the City of Morro Bay range from approximately 63 to 77 dBA. Estimated noise levels are highest along Highway 1 due to relatively high volumes of traffic as compared to other roadways in the city. The lowest estimated noise levels were modeled along roadway segments which run along the bay and commercial areas in the city.

Noise-sensitive areas and land uses

Due to the known effects of noise, which may include speech interference, sleep interference, physiological responses and annoyance, and hearing loss, the City has established criteria to help protect the public health and safety, and prevent disruption of certain human activities. The existing City of Morro Bay General Plan Noise Element, adopted on August 29, 1993, provides a policy framework for addressing potential noise impacts in the city during project review and long-range planning.

Noise exposure goals for each land use type reflect the varying noise sensitivities associated with each of those land uses. The following land uses have been identified in the City General Plan Noise Element (1993) as being noise-sensitive:

- Residential development
- Schools
- Hospitals and nursing homes
- Churches
- Meeting halls, auditoriums, music halls, theaters, and libraries
- Transient lodging – motels and hotels
- Playgrounds/parks
- Offices

The City of Morro Bay has not received any recent noise complaint filings due to disturbance at noise-sensitive receptors in the city (City of Morro Bay 2016).

10.2 REGULATORY SETTING

FEDERAL

Federal Highway Administration

The Federal Highway Administration (FHWA) has established noise abatement criteria that must be considered for the design of federal or federally funded highway projects. Federal regulations also set noise limits for medium and heavy trucks (over 4.5 gross tons). The federal standard for truck pass-by noise at 15 meters (50 feet) is 80 dBA. These standards are implemented through federal regulatory controls on truck manufacturers. Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) provides procedures for conducting highway project noise studies and implementing noise abatement measures to help protect the public health and welfare, supply noise abatement criteria, and establish requirements for information to be given to local officials for use in planning and designing highways. Under this regulation, noise abatement must be considered for a Type I project if the project is predicted to result in a traffic noise impact. A traffic noise impact is considered to occur when the project results in a substantial noise increase or when the predicted noise levels approach or exceed the noise abatement criteria specified in the regulation. 23 CFR 772 does not specifically define what constitutes a substantial increase or the term approach; rather, it leaves interpretation of these terms to the states.

Federal Transportation Administration Vibration Impact Criteria

The FTA has published guidance relative to vibration impacts. The FTA establishes noise standards for federally funded transit projects. The FTA has identified the human annoyance response to vibration levels as 80 VdB.

US Department of Housing and Urban Development

HUD seeks to create quality affordable housing for all Americans and uses its platform to improve the quality of life. To achieve its goals and fulfill its mission, HUD has established its own exterior noise criteria for evaluating projects located in high noise areas (e.g., near an airport, road, or railroad). HUD's exterior noise criterion states that 65 dBA DNL noise levels or less are satisfactory for residential land uses. HUD's criterion does not include standards for interior noise levels.

STATE

California Code of Regulations (Title 24)

Known as the California Building Code, the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources. The standards state that "interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room." The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family residences (e.g., apartments). The code also states: "Residential structures to be located where the annual Ldn or CNEL exceeds 60 dB shall require an acoustical analysis showing that the proposed design will achieve the prescribed allowable interior level."

California Department of Transportation Construction Vibration

The California Department of Transportation (Caltrans) has adopted guidance for construction vibrations. Caltrans uses a vibration limit of 12.7 mm/sec (0.5 inches/sec) peak particle velocity (PPV) for buildings that are structurally sound and designed to modern engineering standards. A conservative vibration limit of 5 mm/sec (0.2 inches/sec) PPV has been used for buildings that are found to be structurally sound, but where structural damage is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a conservative limit of 2 mm/sec (0.08 inches/sec) PPV is often used to provide the highest level of protection. All of these

limits have been used successfully and compliance with these limits has not been known to result in appreciable structural damage. All vibration limits included in the Caltrans guidance for construction vibration apply at the ground level and take into account the response of structural elements (i.e., walls and floors) to groundborne excitation.

California Government Code Section 65302(f)

California Government Code Section 65302(f) requires all general plans to include a noise element that addresses noise-related impacts in the community. The California Office of Planning and Research (OPR) has prepared guidelines for the content of the noise element, which includes the development of current and future noise level contour maps. These maps must include contours for the following sources:

- Highways and freeways
- Primary arterials and major local streets
- Passenger and freight on-line railroad operations and ground rapid transit systems
- Commercial, general aviation, heliport, and military airport operations, aircraft flyovers, jet engine tests stands, and all other ground facilities and maintenance functions related to airport operation
- Local industrial plants, including but not limited to railroad classification yards
- Other stationary ground noise sources identified by local agencies as contributing to the community noise environment

LOCAL

City of Morro Bay General Plan Noise Element

The City of Morro Bay General Plan Noise Element (1993) contains goals, policies, and implementation measures describing the compatibility of sensitive land uses with noise. The purpose of these goals, policies, and implementation measures is to reduce

the various potential effects of noise on people. Table 10.4 summarizes the ranges of noise exposure which are considered to be acceptable, conditionally acceptable, or unacceptable for various noise-sensitive land uses in the city. These ranges are derived from those provided by OPR in the General Plan Guidelines. Table 10.5 summarizes the maximum transportation noise exposure levels for noise-sensitive land uses.

Table 10.4
Community Noise Exposure Levels

Land Use Category	Community Noise Exposure (CNEL,dBA)		
	Acceptable[1]	Conditionally Acceptable[2]	Unacceptable[3]
Residential, Theatres, Auditoriums, Music Halls	<60	60-70	>70
Transient Lodging – Motels, Hotels	<60	60-75	>75
Schools, Libraries, Museums, Hospitals, Nursing Homes, Meeting Halls, Churches	<60	60-75	>75
Playgrounds, Parks	<70	70-75	>75
Offices	<60	60-75	>75

Source: City of Morro Bay 1993

[1] Specified land use is satisfactory. No noise mitigation measures are required.

[2] Use should be permitted only after careful study and inclusion of protective measures as needed to satisfy the policies of the Noise Element.

[3] Development is usually not permitted.

The maximum allowable exterior noise exposure from transportation noise sources in outdoor activity areas for most sensitive land uses is 70 dBA CNEL. The maximum allowable interior noise exposure from transportation noise sources is 45 dBA CNEL.

Table 10.6 summarizes the maximum noise exposure levels for noise-sensitive uses due to stationary noise sources. New development of noise-sensitive land uses may be permitted only where location and design allow the development to meet the daytime and nighttime standards listed therein.

Table 10.5
Maximum Allowable Noise Exposure – Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] CNEL,dBA	Interior Spaces	
		CNEL,dBA	Leq,dBA[2]
Residential	60[3]	45	--
Transient Lodging	60[3]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls, Office Buildings	60[3]	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Source: City of Morro Bay 1993

[1] Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

[2] As determined for a typical worst-case hour during periods of use.

[3] Where it is not possible to reduce noise in outdoor activity areas to 60 CNEL, dBA or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 CNEL, dBA may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Table 10.6
Maximum Allowable Noise Exposure – Stationary Noise Sources[1]

	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly Leq, dBA[2]	50	45
Maximum Level (LAFmax), dBA[2]	70	65
Maximum Level, Impulse Noise (LASmax), dBA[3]	65	60

Source: City of Morro Bay 1993

[1] As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barrier or other property line noise mitigation measures.

[2] Sound level measurements shall be made with slow meter response.

[3] Sound level measurements shall be made with fast meter response.

The maximum allowable exterior noise exposure from stationary noise sources during daytime hours is 70 dBA. The maximum allowable exterior noise exposure from stationary sources during nighttime hours is 65 dBA. The Noise Element (1993) defines outdoor activity areas as "patios, decks, balconies, outdoor eating areas, swimming pool areas, yards of dwelling units and other areas which have been designated for outdoor activities and recreation." Although outdoor recreation areas, such as playgrounds and parks, are considered noise-sensitive, the recommended exterior

noise limit for this land use is 70 dBA CNEL. In mixed-use development, residential noise standards are applied to the residential portion of such projects.

Pursuant to the existing Noise Element, the City shall consider implementing mitigation measures where existing noise levels produce significant noise impacts to noise-sensitive land uses or where new development may result in cumulative increases of noise upon noise-sensitive land uses.

City of Morro Bay Municipal Code

Section 17.52.030 of the City of Morro Bay Municipal Code established noise requirements for the city. In general, the code prohibits any business operation with sustained or intermittent noise levels exceeding 70 dBA CNEL within 100 feet of residential uses, hospitals, and other noise-sensitive uses unless noise levels are mitigated in compliance with the Municipal Code. Additionally, all commercial and industrial deliveries and loud commercial activities within 100 feet of a residential use shall be limited to the hours between 7:00 a.m. and 10:00 p.m. The City is also required to review new public and private development proposals to determine conformance with the policies of the Noise Element. Where the development of a project may result in land uses being exposed to existing or projected future noise levels exceeding the levels specified by the Noise Element, the City shall require an acoustical analysis early in the review process so that noise mitigation may be included in the project design. For development not subject to environmental review, the requirements for an acoustical analysis shall be implemented prior to the issuance of a building permit.

10.3 PRIORITY FINDINGS

MORRO BAY IS A RELATIVELY QUIET ENVIRONMENT

In general, the City of Morro Bay is a relatively quiet environment. The main source of noise in the city is roadway traffic and the City of Morro Bay has not received any recent noise complaint filings due to disturbance at noise-sensitive receptors.

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11.0 Parks, Recreation, and Open Space

Plan MORRO BAY

11.0 PARKS, RECREATION, AND OPEN SPACE

This chapter identifies existing park, recreation, and access conditions in the planning area. This chapter also summarizes applicable regulations for parks and recreation.

11.1 EXISTING CONDITIONS

Morro Bay's parks and open spaces are a key part of the community's identity, connecting residents, businesses, and visitors to the outdoors. The city has established itself as a gathering place for nature and recreation enthusiasts, from surfers to birdwatchers. The community and local government seek to continually enhance and protect open spaces and access to recreational opportunities.

The existing resources and service levels are described in three topic areas: recreation services provided by the City, parks and open space in Morro Bay, and access to resources in the Coastal Zone.

RECREATION SERVICES

Existing Recreational Programs and Services

The City of Morro Bay Recreation Services Division coordinates multiple programs and services for residents. Programs are developed to serve all residents, from young children to senior citizens. Current services can generally be divided into three categories: youth programming (Table 11.1), adult programming (Table 11.2), and community events (Table 11.3).

Table 11.1
Morro Bay Youth Recreational Programming (2016)

Program Name	Program Description
Junior Lifeguards	The Morro Bay Junior Lifeguards teaches youth ocean safety, first aid, environmental awareness, and rescue techniques.
Morro Bay Kids Club and Camp	After-school and summer alternatives for children and youth are provided by the City's Youth Services Division for students from elementary to high school. Kindergarten through 5th grade students at Del Mar Elementary are eligible for child care at the Kid's Club Children's Center.
Teen Center and Skate Park	After-school recreational activities for middle and high school students.
Coast Girls Softball League	Coast Girls Softball is an ASA-affiliated fast-pitch league open to girls living in Morro Bay, Los Osos, Cayucos, and Cambria. Four divisions are offered: • 8 and under • 10 and under • 12 and under • 14 and under
Estero Bay Youth Basketball	This program is open to boys and girls in 3rd through 8th grades from Morro Bay, Cayucos, and Los Osos. Games are played one to two times weekly, from December to March.
Estero Bay Youth Futsal	Futsal is a fun, noncompetitive indoor soccer program offered during the spring (April to June). The game is fast-paced and is played on a basketball court, and is open to boys and girls ages 5 to 18.
Estero Bay Youth Soccer	Estero Bay Youth Soccer is a division of CYSA (California Youth Soccer Association, South) and plays games with soccer leagues from Los Osos, Cambria, Templeton, and Atascadero. The league offers eight divisions: • 6 and under (coed) • 8 and under (coed) • 10 and under (boys) • 10 and under (girls) • 12 and under (boys) • 12 and under (girls) • 14 and under (boys) • 14 and under (girls) Games typically run from September to March.
T-Ball/Coach Pitch	This league is an introduction to baseball and is open to boys and girls ages 4 to 7. The season begins with T-ball and progresses to Coach Pitch. Registration typically opens in February and the season runs from April to June.

Table 11.2
Morro Bay Adult Recreational Programming (2016)

Program Name	Program Description
Adult Softball	The adult softball league typically consists of the following four divisions: Coed, Men's C2, Men's D1, and Masters (over 50). All divisions typically play a 10-game season ending with a tournament. All team members must be at least 16 years old (except in the Masters Division, where the minimum age is 50).
Adult Soccer	An adult coed soccer league is offered through the Recreational Sports Division during the winter season. The league consists of eight games played at Lila Keiser Park in the evenings once weekly.
Aikido Self Defense	Aikido is a martial art that consists of self-defense techniques to redirect and neutralize an attack. This training is hosted at the Morro Bay Community Center for residents ages 12 to 60.

Table 11.3
Morro Bay Community Recreational Events (2016)

Program Name	Program Description
Rock to Pier Fun Run & Half Marathon	The Rock to Pier Run is a 6-mile all-beach run starting at Morro Rock, heading north to Cayucos Pier. Every July, participants of all ages and abilities compete in this run with well over 1,000 runners from all over the world.
Project Surf Camp	The City partners with Project Surf Camp, a nonprofit organization which uses surfing and the ocean to build self-confidence, self-esteem, and self-efficacy in individuals with special needs.
Tennis Play Day	City-coordinated meeting of Morro Bay tennis players for casual doubles play. Hosted twice weekly at Monte Young and Del Mar Park tennis courts.
Pickleball Play Day	City-coordinated meeting of pickleball players of all ages and skill levels. Hosted five days a week at Del Mar Park roller hockey rink. The Morro Bay Pickleball Club is sponsored by Morro Bay Senior Citizens, Inc.

Facility Rentals

The City owns a number of community facilities that serve as important gathering places and help support a social and healthy community. These facilities are listed in Table 11.4. These facilities, as well as some parks in Morro Bay, can be rented by the public for meetings and events.

Table 11.4
Community-Based Facilities in Morro Bay (2016)

Facility Name	Facility Address	Facility Amenities
Community Center	1001 Kennedy Way	• Auditorium • Multipurpose room • Lobby • Full kitchen • Parking
Veteran's Memorial Building	209 Surf Street	• Assembly hall • Full kitchen • Large fenced patio • Picnic benches and barbeque pit • Parking
Morro Bay Teen Center and Skate Park	231 Atascadero Road	• Skate park • Kitchen • Multipurpose room • Parking

In addition to the City-owned buildings available for community use detailed in Table 11.4, the following parks and open space areas are available for rent:

Open Areas

- Anchor Memorial Park open area
- Bayshore Bluffs Park open area
- Centennial Parkway open area
- City Park open area
- Cloisters Park open area
- Monte Young Park open area
- Morro Rock Beach open area
- Tidelands Park open area

Park Facilities

- City Park basketball courts
- Coleman Park
- Coleman basketball courts
- Del Mar Park hillside or meadow
- Del Mar Park basketball courts
- Del Mar roller hockey rink (being converted to pickleball courts)
- Del Mar tennis courts
- Lila Keiser Park barbecue
- Lila Keiser Park baseball fields
- Monte Young tennis courts
- North Point Overlook
- Giant chessboard

In addition to City recreational and community facilities, the San Luis Obispo County Parks and Recreation Department operates the Morro Bay Golf Course, a public course on the city's southern border owned by the California Department of Parks and Recreation. The 18-hole course has a range of rental and course options for visitors. It is located in the city's Open Area 2 zone, which allows for a broader range of recreational uses. Reservation of campsites and picnic areas at Morro Bay State Park and at Morro Strand State Beach are managed by the California Department of Parks and Recreation, through the Reserve America website. Two group camping spots, 28 RV/trailer-only spots, 87 standard (tent or trailer), and 5 tent-only sites are available at the Morro Bay campgrounds. While not owned by the City, the Estero Bay Community Garden, at San Jacinto and Ironwood, allows community members to rent 15-foot by 15-foot organic plots, supporting community health and connectivity.

PARKS

Morro Bay parks range from small memorials to large open spaces, representing the city's confluence of urban development and coastal wilderness. This diversity of park types captures the needs of a community that is a bustling tourist destination while preserving a small-town character.

The following description of existing parks is split into three sections: community-based parks, resource-based parks, and state parks. Community-based parks are improved areas located close to residential neighborhoods and include playgrounds, picnic areas, shelters, playing fields and courts, and other man-made structures. Resource-based

parks are generally unimproved areas that provide trails, benches, and stairways, but otherwise preserve natural features such as open spaces, coastlines, and wetlands. Two state parks and a preservation area are located in the city; these areas are owned and operated by the California Department of Parks and Recreation.

Community-Based Parks

A number of Morro Bay parks are located in neighborhoods and commercial areas. These community-based parks and facilities create opportunities for residents and visitors to gather, play, and relax. Community-based parks in Morro Bay are shown in Table 11.5 and within the larger context of citywide recreation in Figure 11.1. Over half of the parks in the city are under 5 acres, providing primarily small play areas, benches, and barbecues. Some larger parks, such as Del Mar Park, provide a broader range of recreation activities, including sports courts, a dog park, and an amphitheater. Many parks provide access to the coast and Embarcadero, including Anchor Memorial Park, Centennial Parkway, Cloisters Park, Coleman Park, Mariner Memorial Park, and Tidelands Park.

Morro Bay has explored the use of parklets to create additional community-based park space along the downtown section of Main Street. A demonstration parklet was installed in early 2015, but was removed after seven months. At the time of the decision to deconstruct the parklet, multiple council members indicated that they would still like to explore the concept of parklets in different locations in the city in the future (City of Morro Bay 2015a).

Table 11.5
Community-Based Parks in Morro Bay

Park Name	Park Address	Park Amenities	Acres	Ownership
Anchor Memorial Park	931 Embarcadero	• Public observation dock • Benches • Drinking fountains • Oval picnic tables	.06	City of Morro Bay

Park Name	Park Address	Park Amenities	Acres	Ownership
Centennial Parkway	1041 Front Street	• Stairway access between Market Ave and Front Street • Giant chessboard • Chess tables • Benches • Restrooms	1.0	City of Morro Bay
City Park	750 Harbor Street	• Basketball courts • Benches • Drinking fountains • Picnic tables • Play area • WW II Monument • Restrooms	2.0	City of Morro Bay
Cloisters Park	2500-24000 Coral Avenue	• Wetlands area and walking path • Benches • Restrooms • Picnic tables • Play area • Barbeques	8.0	City of Morro Bay
Coleman Park	101 Coleman Drive	• Harbor walk pedestrian path • Benches • Restrooms • Picnic tables • Basketball court • Swing set	1.1	City of Morro Bay
Del Mar Park	3099 Ironwood Avenue	• Natural creek • Basketball court • Play area • Roller hockey rink • Amphitheater • Horseshoe pits • Barbeques • Sports fields • Dog park • Tennis courts • Restrooms	9.0	City of Morro Bay

Park Name	Park Address	Park Amenities	Acres	Ownership
Lila Keiser Park	1 J Street	• 2 Baseball/softball fields • Soccer field • Covered picnic area • Barbeque • Play area • Horseshoe pits • Restrooms	10.0	Dynegy
Mariner Memorial Park	500 Embarcadero	• Public observation dock • Benches • Drinking fountains	1.0	City of Morro Bay
Monte Young Park	24 South Street	• Tennis courts • Play area • Public restroom • Picnic areas	1.0	City of Morro Bay
Morro Bay Bike Park	301 Little Morro Creek Road	• Bike terrain, including jumps, pump track, and other mountain bike features	4.0	Privately owned
Rockies Teen Center and Skate Park	231 Atascadero Road	• Upgraded skating equipment • Teen Center with after-school programs and activities with Youth Service Leaders • Teen Center • Bike days every Wednesday and Sundays • Reservations available for large parties	1.4	City of Morro Bay
Tidelands Park	300 Embarcadero	• Play area • Barbecues • Picnic area • Restrooms • Stairs to bay shore	2.0	City of Morro Bay
		Total City-owned	26.56	
		Total	40.56	

Resource-Based Parks and Open Space

In addition to the 11 community-based parks across Morro Bay, the City manages three resource-based parks that preserve and protect natural resources while providing scenic and passive uses for residents and visitors. Maintained trails, benches, and

stairways provide usability, beach access, and views of some of Morro Bay's most prized visual assets, such as Morro Rock. (For more information on trails, see Chapter 13, Transportation and Mobility). Details about Morro Bay's resource-based parks are detailed in Table 11.6, and are shown in Figure 11.1.

Table 11.6
Resource-Based Parks in Morro Bay

Park Name	Park Address	Park Type	Acreage	Owner
Bayshore Bluffs Park	170 Bayshore Drive	• Preserved meadow • Connected by Morro Bay bike path • Bay and wildlife observation deck • Kayak launch • Parking lot	3.0	City of Morro Bay
Morro Rock Beach	Coleman Drive	• Sandy beach access • Surf access • Pedestrian trail across Morro Creek • Parking lot	1.0	City of Morro Bay
North Point Park	3480 Toro Lane	• Beach access stairway • Preserved meadow • Parking lot	1.0	City of Morro Bay
		Total	5.0	

In addition to the parks owned and operated by Morro Bay that are managed natural places, a number of open spaces in the city are zoned to sustain preservation (see Figure 11.2). These areas provide important habitat for threatened and endangered species, and maintain the city's connection to nature. Morro Bay is also surrounded by marshland, grazing land, habitat conservation areas, and cropland. These areas provide an unofficial greenbelt around the city, although much of the land is private property and does not provide recreational benefit to community members or visitors.

State Parks

The city is home to two state parks and a state marine recreational management area, together totaling over 5,000 acres of recreation and open space area. The parks are managed, owned, and operated by the California Department of Parks and Recreation. From July 2014 to June 2015, Morro Bay State Park welcomed 1,147,363 day use and camping visitors, and Morro Strand State Beach welcomed 273,995 visitors (California Department of Parks and Recreation 2015). These parks play an important role in the

local economy, and benefit residents by providing and preserving recreational resources. Both Morro Strand State Beach and Morro Bay State Park provide essential coastal access; diverse recreational opportunities including surfing, sport fishing, and kayaking; and preservation of important estuarine habitats. The state parks are detailed below in Table 11.7, and identified alongside other parks in Figure 11.1.

Table 11.7
State Parks in Morro Bay (2016)

Park Name	Park Address	Acreage
Morro Strand State Beach	305 Yerba Buena St	184
State Marine Recreational Management Area	N/A	2,100 (including aquatic resources)
Morro Bay State Park	60 State Park Road	2,800
	Total	5,084

CURRENT PARK SERVICE LEVELS

Morro Bay owns and operates approximately 31.56 acres of accessible open space and parkland for its approximately 10,640 residents, providing a park service level of 2.97 acres per 1,000 people. This is slightly below the 3 acres per 1,000 residents established by the Quimby Act, and does not include the over 3,000 acres of state-owned parks and beaches in the city, which provide additional benefit to residents and visitors.

The natural amenities in Morro Bay attract visitors throughout the year, including both seasonal residents and short-term guests. Using estimates developed using transit occupancy taxes, Morro Bay hosted between 1.5 and 2.2 million visitors from July 2014 to June 2015 (City of Morro Bay 2015b). A majority of the transit tax was collected between July and October, and again in May and June, indicating higher summertime visitors. Including these annual visitors in the assessment of park service levels drops the service to 0.28 acres per 1,000 people. However, inclusion of visitors is not mandated. Furthermore, the inclusion of state parks in the planning area, a large draw for visitors, brings the service level to 1.5 acres per 1,000 people if visitors are included.

COASTAL ACCESS

One of the fundamental goals of the Coastal Act is to provide maximum public access to the coast by protecting existing access points and creating new public access. Upholding this goal is a crucial part of developing a Local Coastal Plan. Coastal access benefits Morro Bay by creating open beaches and coastlines that promote recreation, tourism, and ecosystem health. Coastal access points in Morro Bay are shown below in Figure 11.3.

Two types of access are shown in this map. Lateral access defines the ability to walk parallel to the coastline. In Morro Bay, lateral access is found along from the City's northern border, around Morro Rock, to the start of the Embarcadero. Previously, when water from Morro Creek crosscut the beach to reach the ocean, there was a lateral access interruption and the creek was difficult or impossible to cross.

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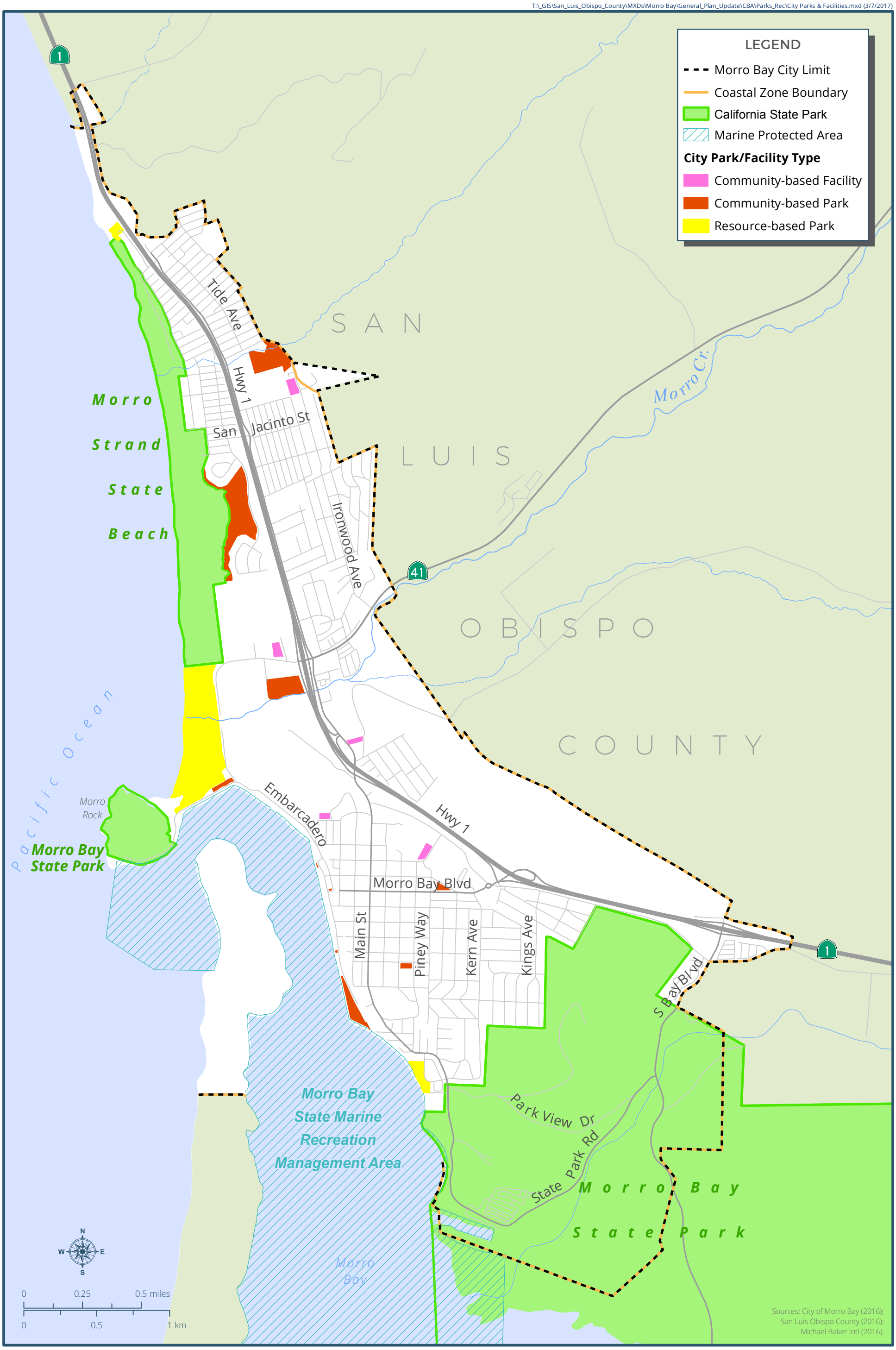

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FIGURE 11.1

City Parks and Facilities

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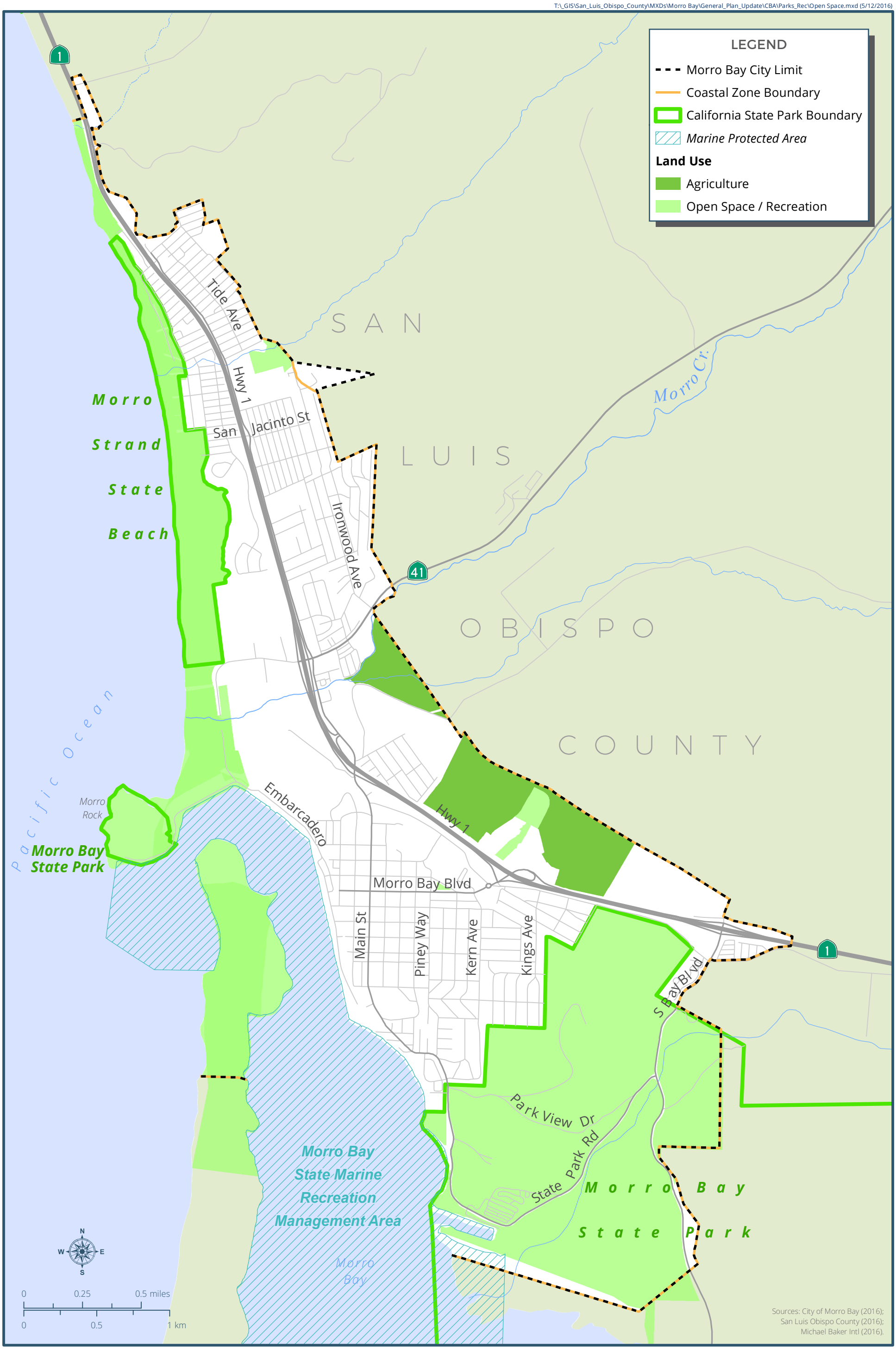

FIGURE 11.2

Morro Bay Open Space

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The development of a multiuse trail and bridge project, completed in 2015, provides safe crossing for pedestrians, bicyclists, and emergency vehicles across the creek. There is an outstanding lateral access issue on the southwestern portion of the coastline, near Bayshore Bluffs Park, where a hotel and housing development block public access to the coast. While commercial uses stand between the sidewalk along the Embarcadero and the coast, bayside decks with access roughly between every two commercial buildings allows segments lateral access along the bay. Additionally, the City requires that property owners extend the community's pedestrian and bicycle waterfront trail (the Harborwalk) in front of their properties when buildings are retrofitted, if the trail does not already serve their properties.

Lateral access is reached by vertical access points, which indicate perpendicular access to the coast. As illustrated in Figure 11.3, the City has extensive vertical access points throughout the entirety of the coastal zone.

California Coastal Trail

The California Coastal Trail (CCT) is an ongoing effort to connect the state's multiple pedestrian routes along the Pacific Ocean into a unified, 1,200-mile trail extending from the Oregon to Mexican borders. This goal was supported by the 1972 passage of California Proposition 20, which recommends that a trail system be established along or near the coast. In 1999, the CCT was designated California's Millennium Legacy Trail by the governor and the White House Millennium Trail Council. This was followed in 2000 by an official assembly declaration (AACR20) of the CCT as an official state trail. Approximately 600 miles of the CCT has been completed to date (Coastwalk 2016). This vision promotes the Coastal Commission's coastal access objectives.

The beach from the northern border of Morro Bay to the end of the Morro Strand State Beach, and Highway 1 starting at Morro Bay Boulevard, are segments of the CCT, shown in Figure 11.3. Because of the tentative nature of these routes, as identified by the state, the routes shown on this map are only conceptual alignments. Additional lateral coastal access along Morro Rock Beach is not identified as part of the CCT, nor are the numerous vertical coastal access points along the Embarcadero. The City does not have an existing plan detailing further implementation of the CCT.

Encroachments on Public Access

The Coastal Commission identifies structural development on beaches, even structures such as decks, boardwalks, or parking lots, as limits to the use of the beach. These limitations, which include fences, no parking signs or barriers, private development, and extensive landscaping, are all understood to be encroachments on the public's ability to access the coast. In Morro Bay, only a handful of encroachment issues impede coastal access. At the city's northern border along Highway 1, chain link fencing has been placed along the coastline, obstructing access to the northernmost portions of Morro Strand State Beach. In portions of this fence, the chain link has been pulled back, creating informal access points to the coast. Along the city's northern border as Highway 1 runs south into Morro Bay, parking lots are intermittent, and a portion of the highway's shoulder is marked with no parking signs. The lack of continuous coastal parking along this northern coastline creates a potential encroachment issue.

Along the California coast, the public has historically used coastal areas, prior to development and infrastructure obstructions being put in place. Trails to the beach, informal parking areas, beaches, and bluff tops have provided recreational opportunities for hiking, picnicking, fishing, swimming, surfing, diving, views, and nature observation. California law provides that under certain conditions, long-term public access across private property may result in the establishment of a permanent public easement. This is called a public prescriptive right of access (California Coastal Commission 2016a). In 2015, the prescriptive rights of a trail between Toro Lane and the coast (at 3420 Toro Lane) drew assertion of frequent public access across the private property from over 75 Morro Bay residents (City of Morro Bay 2016e). Completed questionnaires demonstrated that coastal access from the path started as early as the 1960s.

A home is currently proposed to be built over the existing trail, and as a condition of approval for the home, the City required that the property owners construct a replacement trail similar in location, configuration, and utility to the existing trail. City staff has determined that there are sufficient coastal access routes in the vicinity of the project (City of Morro Bay 2015c).

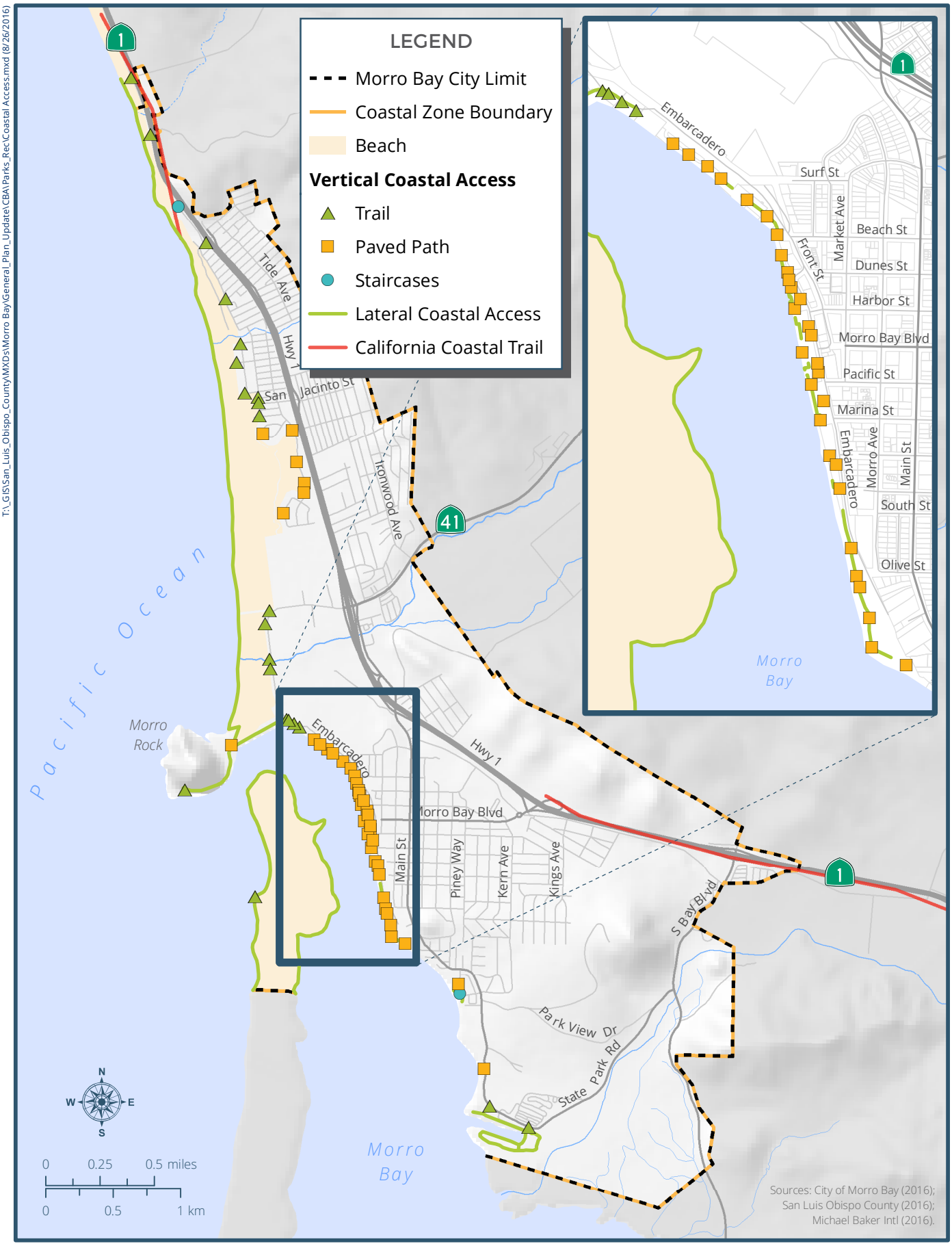

FIGURE 11.3

Coastal Access

Page 2

The California Coastal Commission did not find that building a home over the existing trail and constructing a replacement trail created a substantive barrier to coastal access (California Coastal Commission 2016b). The access point is currently subject to a lawsuit (Wilson 2016).

Coastal Amenities

Morro Bay residents and visitors alike are served by coastal amenities that make the city's beaches safer, cleaner, and more attractive. There are 10 public restrooms located within the coastal zone. During summer months (typically Memorial Day to Labor Day), the Morro Bay Harbor Department staffs two lifeguard towers on the City Beach north of Morro Rock. Lifeguards are on duty from 10 a.m. to 6 p.m. during active months.

Coastal amenities are shown in Figure 11.4. The waterfront zoning district also supports and encourages use of the coastline. The purpose of the waterfront district is to provide for the continued mixture of visitor-serving commercial and recreational and harbor-dependent land uses in appropriate waterfront areas, as shown on Figure 11.4 (City of Morro Bay 2016d).

Special Events

Morro Bay's scenic vistas, mild climate, and expansive coastal resources make it a popular place for special events such as food and wine events, sporting and running events, arts fairs, and seasonal gatherings. Such events attract visitors and tourism dollars, and bring excitement to the community, but these economic and social benefits must also be examined for any encroachments on coastal access. As detailed in the regulatory setting below, the Coastal Commission's *Local Coastal Program Update Guide* specifies the impact of temporary events on loss of public access, stating that "temporary events staged on beaches also limit use by the general public, especially when they would commit large areas to special, commercial events on most summer weekends. The LCP should address such topics as the type, location, and intensity of such events, including scheduling, transportation to the event, how the location of the event will affect public use, signage, mitigation measures, and clean-up" (California Coastal Commission 2013).

The City's current LCP does not include policies, programs, or background information about special events. However, the City retains the right to not grant a permit for the use of City property, when for any reason as determined by the Recreation Services Division such use may not be in the best interest of the department or the City of Morro Bay. This includes unlawful obstruction of public access to the coastline. While the facilities (including parking lot and beach) at Morro Rock can be reserved for special events, Morro Strand State Beach is a state property and remains open to the public even when the Morro Rock Beach is reserved. Clear lateral access along the beach allows for foot access to the coast even if main coastal thoroughfares, such as the Embarcadero, are closed to vehicle traffic. Coastal access to the beach has not been disrupted by special events that have historically occurred in Morro Bay.

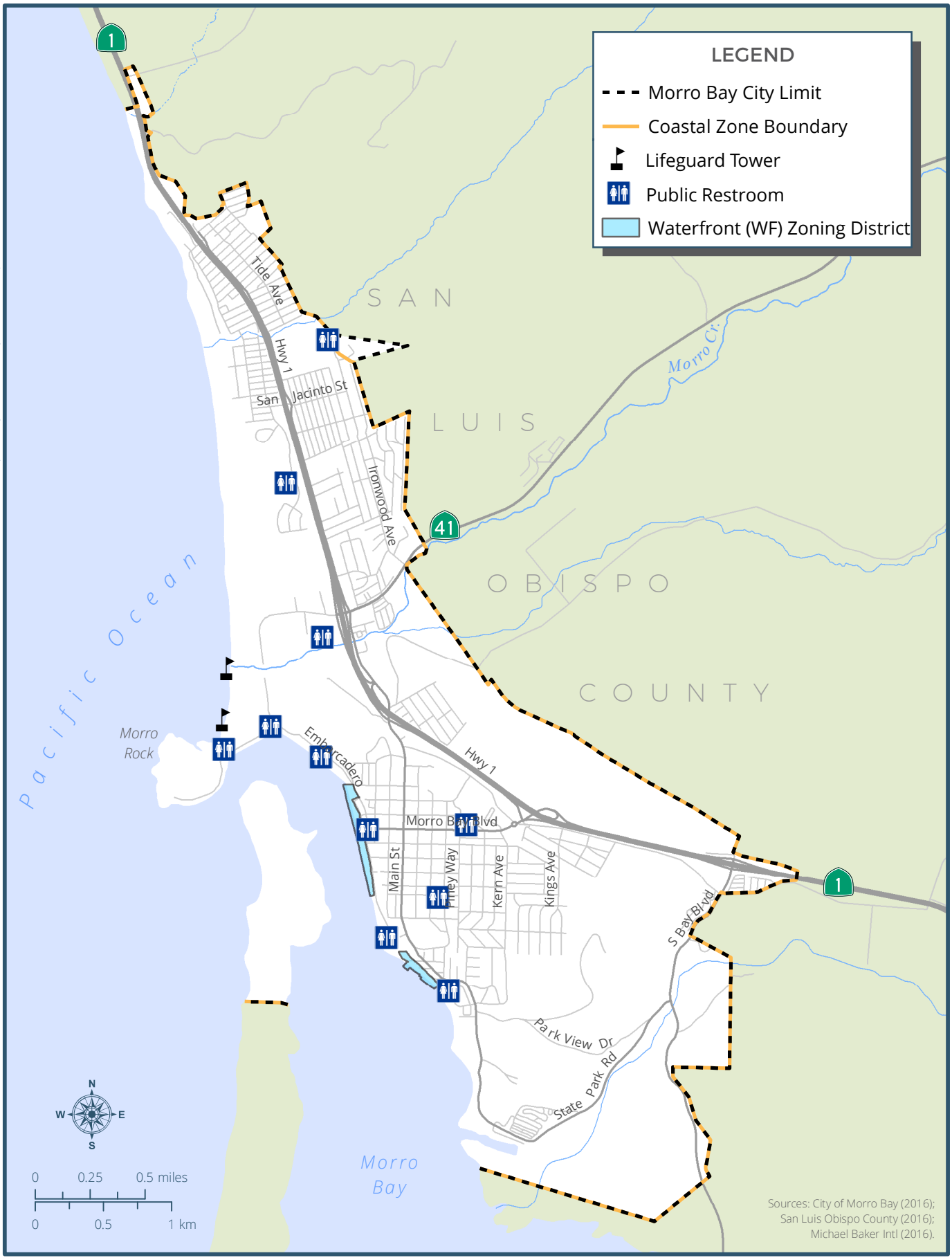

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FIGURE 11.4

Coastal Zone Amenities

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11.2 REGULATORY SETTING

FEDERAL

No federal regulations apply to parks, recreation, or open space.

STATE

Quimby Act

As a condition of approval of a final tract or parcel map, the California Quimby Act allows a city to require dedication of land, the payment of in-lieu fees, or a combination of both to be used for the provision of parks and recreational services. Under the act, cities can require land or in-lieu fees for a minimum of 3 acres per 1,000 residents, with the possibility of increasing the requirement to a maximum of 5 acres per 1,000 residents if the city already provides more than 3 acres per 1,000 residents.

California Coastal Act

In 1972, a voter initiative established the California Coastal Act of 1976 (Coastal Act) and the California Coastal Commission, the state's coastal protection and planning agency. The Coastal Act and the California Coastal Commission plan for and regulate new development, and create strong policies to protect public access to and along the shoreline. To ensure maximum public access to the coast and public recreation areas is provided, the Coastal Act directs each local government within the coastal zone to prepare an LCP in consultation with the Coastal Commission and the public that is consistent with Section 30501 of the Coastal Act. Provisions of the Coastal Act surrounding parks and recreation are summarized below.

Section 30210 - Access; recreational opportunities; posting

In carrying out requirements of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all of the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30212.5 - Public facilities; distribution

Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.

Section 30221 - Oceanfront land; protection for recreational use and development

Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Section 30252 - Maintenance and enhancement of public access

The location and amount of new development should maintain and enhance public access to the coast by (1) facilitating the provision or extension of transit service, (2) providing commercial facilities within or adjoining residential development or in other areas that will minimize the use of coastal access roads, (3) providing nonautomobile circulation within the development, (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, (5) assuring the potential for public transit high-intensity uses such as high-rise office buildings, and (6) assuring that the recreational needs of new residents will not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of on-site recreational facilities to serve the new development.

Until an LCP has been adopted by the local jurisdiction and certified compliant with the Coastal Act, the Coastal Commission retains permitting authority within the local jurisdiction. A coastal development permit is required for development in the Coastal Zone that results in changes to the density or intensity of the use of land, water use, and/or coastal access.

Section 30610(i) - Coastal development permit requirements for temporary events

In 2013, the Coastal Commission released the updated *Local Coastal Program Update Guide*. The document provides guidance and best practices for local governments that are updating an LCP. With regard to public access, the guidance notes that "LCP updates should evaluate whether incremental actions since LCP certification may reduce public access and … include measures to prevent any reduction in public access." The "Preventing Loss of Public Access" subsection that covers temporary events reads as follows: "Temporary events staged on beaches also limit use by the general public, especially when they would commit large areas to special, commercial events on most summer weekends. The LCP should address such topics as the type, location, and intensity of such events, including scheduling, transportation to the event, how the location of the event will affect public use, signage, mitigation measures, and clean-up."

The guidance notes that all temporary events are to be excluded from coastal development permit requirements except those which meet all of the following criteria:

a) Are held between Memorial Day weekend and Labor Day; and

b) Occupy all or a portion of a sandy beach area; and

c) Involve a charge for general public admission or seating where no fee is currently charged for use of the same area (not including booth or entry fees).

Additionally, events may be excluded from permit requirements when:

a) The fee is for preferred seating only and more than 75 percent of the provided seating capacity is available free of charge for general public use; or

b) The event is held on sandy beach area in a remote location with minimal demand for public use, and there is no potential for adverse effect on sensitive coastal resources; or

c) The event is less than one day in duration; or

d) The event has previously received a coastal development permit and will be held in the same location under similar conditions and circumstances.

Even in cases where a temporary event is consistent with the requirements listed above, the Coastal Commission can require that event to be subject to coastal development permit review if that particular event has the potential for the following significant adverse impacts on coastal resources:

a) The event, either individually or together with other temporary events scheduled before or after the particular event, precludes the general public from use of a public recreational area for a significant period of time; or

b) The event will directly or indirectly impact sensitive natural or visual resources; or

c) The event is scheduled between Memorial Day weekend and Labor Day and would restrict public use of roadways or parking areas or otherwise significantly impact public use or access to coastal waters; or

d) The event has historically required a coastal development permit.

LOCAL

The City of Morro Bay Recreation Services Division provides recreation and parks programs that support health and wellness for all people and families in the community (City of Morro Bay 2016a). The City boasts parks and recreational resources that highlight the region's natural coastal resources and provide community gathering places for all residents and visitors. The planning area includes nearly 50 acres of parkland and 3 linear miles of public beaches. Morro Bay State Park and Morro Strand State Beach are located within the planning area. These natural resources are both owned and managed by the California Department of Parks and Recreation, but provide significant recreational benefits to Morro Bay residents and visitors.

The Recreation Services Division comprises three divisions (City of Morro Bay 2016b):

- Administration – This division supports all divisions with numerous reports, billing, budgeting, and clerical duties. The Administration Division also provides and coordinates classes, affiliated clubs, and youth sports camps, and oversees the department's online registration program, permitting, and facility and park reservations.

- Recreational Sports – The Recreational Sports Division hosts adult and youth sports leagues, tournaments, the Brian Waterbury Memorial Rock to Pier Run, and the Junior Lifeguard program. The Recreational Sports Division works with youth and adult sports advisory boards to provide all-star opportunities for some youth sports leagues.

- Youth & Senior Services – The Youth and Senior Services Division provides programming to meet the needs and interests of children and the elderly in Morro Bay. Programming includes operation of the Morro Bay Teen Center and Skate Park. The Youth and Senior Services Division provides before- and after-school care for Del Mar Elementary students, licensed by the state of California. During the summer, this division offers a summer day camp program for children entering 1st through 6th grades. Additionally, this division coordinates with Morro Bay Senior Citizens Inc., a nonprofit 501(c)(3) organization, to provide senior activities offered at the Morro Bay Senior Center.

The Morro Bay Recreation and Parks Commission, composed of seven voting members, provides recommendations to the City Council on all matters relating to parks and public recreation (City of Morro Bay 2016c). The commission's other obligations are:

- Cooperate with other governmental agencies and civic groups in the advancement of sound recreation and parks planning and programming.

- Formulate policies on recreation services, parks, and open space for approval by the City Council.

- Recommend to the City Council the development of recreational areas, parks, facilities, open spaces, programs, and improved recreation services.

- Recommend to the City Council the adoption of rules, regulations, and standards concerning recreation and parks in respect to organization, personnel, areas and facilities, programs, and financial support.
- Advise the Recreation Services director in the preparation of the annual parks maintenance, park improvement and recreation budgets, and long-range recreation and parks facilities improvements.
- Hold public hearings and meetings to conduct investigations and surveys for the purpose of securing facts and data concerning parks and public recreation.

Together, the Recreation and Parks Commissions and the Recreation Services Department continue to develop a range of policies and programs that provide the Morro Bay community with a variety of recreational opportunities.

Morro Bay Municipal Code

The Morro Bay Municipal Code guides planning activities to support the community's goals and vision. The following sections of the code support the development and protection of parks and recreation resources in the city.

Chapter 2.24 - Recreation and parks department

This chapter establishes the recreation and parks department for the City of Morro Bay. The functions established are to provide opportunities for wholesome, year-round public recreation service for all age groups. The recreation and parks department is also responsible for development and maintenance of park and recreation facilities, and the planning of facilities and standards in the city.

Chapter 15.08.040 - Special events – traffic restriction authority

This section provides the authority to restrict or prohibit waterborne traffic in the harbor to ensure the safety of persons, vessels, or other property during a race, regatta, parade, or other event held on the waters surrounding Morro Bay.

Chapter 16.44 - Conservation subdivisions

This chapter guides the design of new subdivisions to cluster development lots on smaller sizes and offer dedicated land for open-space use in the area saved. This ordinance is centered on the principles of open space preservation and community connectivity.

Morro Bay Local Coastal Program (LCP)

The Morro Bay LCP consists of the Coastal Land Use Plan (general plan-level policies and maps) and a Local Implementation Program (coastal zoning code, zoning maps, and implementing ordinances). Adopted by the City and certified by the Coastal Commission in 1984, Chapter 3 of the City's LCP addresses considerations of public access and recreation in the Coastal Zone. LCP policies and plans address both shoreline access and coastal recreation, given the extent of overlap between the topics. As stated in the Coastal Land Use Plan, "Morro Bay enjoys an exceptionally large amount of shoreline public access and recreation opportunities, and some of these opportunities have the capability to be expanded or enhanced." These policies are in compliance with Coastal Act requirements for access and recreational opportunities.

11.3 PRIORITY FINDINGS

COASTAL ACCESS

The City provides exceptional lateral and vertical access to the coast. The northern coastline, part of the CCT's general alignment, provides pedestrians unfettered access along the shore. As the Pacific coast turns into the bay, the city maintains both urban and coastal access to the water. The jetty allows visitors to walk along the entire outer rim, providing access to both the ocean and bay sides. Along the Embarcadero, spaces between bayside businesses allow visitors and residents to walk between the commercial uses to docks and decks that face the bay. The City is constructing the Harborwalk along the waterfront, which will provide a dedicated pathway for pedestrians and bicyclists, along with designated viewing areas, seating, and bicycle parking. The first phase of the project was completed in 2008.

CALIFORNIA COASTAL TRAIL

While SLOCOG identifies the CCT as extending north to south to the end of the state beach, and picking up again from US 101 south into San Luis Obispo, there is no specific CCT alignment through Morro Bay. The City has the potential to identify and establish an alignment that could make use of the community's excellent lateral coastal access. Recent pedestrian improvements over Morro Creek have demonstrated the City's continued commitment to coastal access, which could be further supported by an official alignment of the CCT through the community. The California Coastal Commission is the lead state agency responsible for planning and permitting along the coastline. While the CCT is not a requirement of the Coastal Act, it supports Coastal Act requirements to provide access to the coastline while respecting and protecting natural resources.

PARKS AND OPEN SPACE AVAILABILITY

Existing levels of service for parks and open space in the community far exceed applicable standards. The City's community and resource-based parks provide a diverse range of recreational opportunities for year-round residents and seasonal visitors. This demonstrates how Morro Bay residents of all ages are able to capture the advantages of a robust parks system, including a healthier community and strong tourism economy. The distribution of parks and open space throughout the community enables residents of different economic means to enjoy equitable access to recreational opportunities.

12.0 Shoreline Management and Protection

Plan MORRO BAY

12.0 SHORELINE MANAGEMENT AND PROTECTION

This chapter discusses existing shoreline conditions in Morro Bay, including protective devices and natural shorelines. Original construction associated with harbor development and ongoing channel maintenance were major factors that shaped local shoreline conditions. Projected shoreline conditions will continue to be affected by natural factors, such as seasonal storm and wave patterns, and larger scale climatic factors, including sea level rise. Anthropogenic activities, such as beach nourishment and coastal development, will also play a role in how the shoreline conditions change over the planning horizon.

12.1 EXISTING CONDITIONS

Prior to the 1930s, Morro Bay was the home of a small commercial fishing fleet that was able to use the natural channels within the bay (CSMW 2016). Vessels would enter the bay from both northern and southern entrances, contingent on seasonal processes. In the 1930s, the Works Progress Administration built a seawall that connected the Morro Rock to the mainland, eliminating vessel access to the bay from north of the rock and blocking longshore sediment transport that predominantly moves north to south in this area. In the 50 years following the seawall's construction, beaches advanced seaward (accreted) about 250 feet near San Jacinto Street and almost 500 feet in front of Morro Bay High School (Griggs, Patsch, and Savoy 2005). This accretion has provided an effective storm buffer in the form of a sandy beach backed by a vegetated dune system along most beaches north of Morro Rock.

In the 1940s, the US Army Corps of Engineers (USACE) constructed a north breakwater, which extended southerly from Morro Rock, and a south jetty which extended seaward, perpendicular from the sandspit, to provide protected harbor for small Navy patrol vessels. The north breakwater was damaged repeatedly soon after construction was completed. The breakwater was eventually reconstructed in 1964. In contrast, the south jetty suffered no major damage during this time and only required maintenance typical for this type of structure. Over the same time period, the landside element of Morro Bay's existing Embarcadero waterfront was created with dredged material pumped from the navigation channel and placed behind a rock seawall.

The City's shoreline management primarily consists of routine USACE dredging and the placement of sediment derived from Morro Bay navigation channels. Materials dredged from these channels are placed in the nearshore or surf zone in the Morro Bay Littoral Cell. Shoreline structures in the city include two shoreline revetments used to protect backlands from wave-driven erosion, a jetty system used to provide safe vessel passage into the harbor, and bayside riprap and bulkhead walls that serve to protect these lands against wave and tidal induced erosion along the bay.

DREDGING OPERATIONS IN MORRO BAY

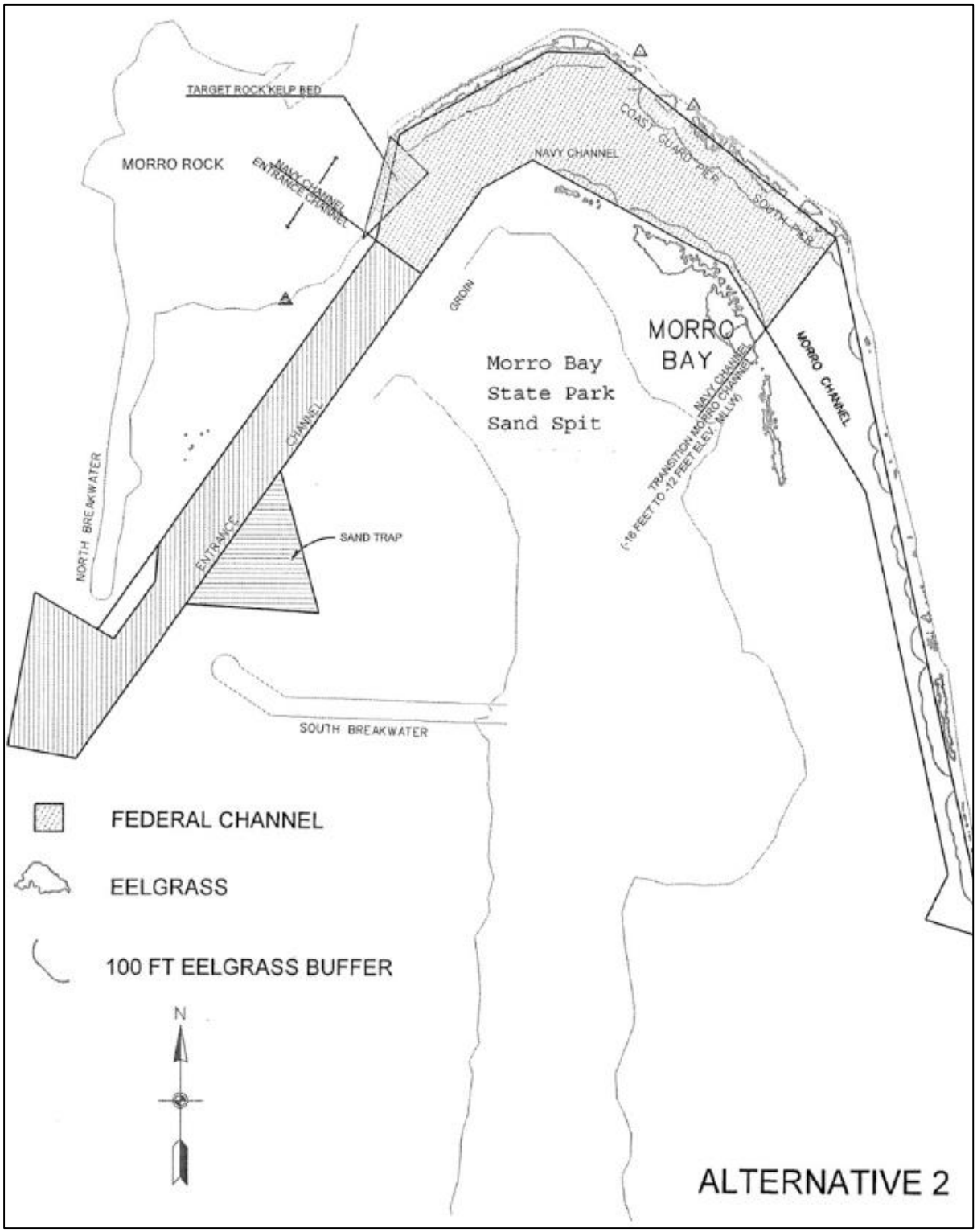
Over time, the USACE has frequently dredged the federal channel in Morro Bay to maintain safe passage of vessels into the bay. The federal channel consists of the entrance channel, the transition channel, the sand trap, the main channel, the Navy channel, and the Morro Channel (Figure 12.1).

From 1960 to 1990, maintenance dredging of the federal channel occurred on average twice per decade. However, channel dredging has occurred annually from 1994 to the present. The average annual dredging rate from 2006 to 2014 was 185,000 cubic yards per year (CSMW 2016). Based on a US Geological Survey study, littoral sediment transported north along the sandspit by waves and currents accounts for approximately 90 percent of the shoaling within the navigation channels (City of Morro Bay 1982). Other sources of sediment that contribute to shoaling are wind-blown sand from the dunes and sediment from Chorro Creek and Los Osos Creek.

Dredged materials have historically been placed in the nearshore area off Morro Bay State Park sandspit or the surf zone at Morro Strand State Beach (Figure 12.2). Use of either of these sites is dependent on the type of USACE dredge platform used. The Morro Bay State Park sandspit placement site is used when a hopper or clamshell dredge is used and is located in nearshore waters between water depths of -20 to -40 feet relative to the mean lower low water level.

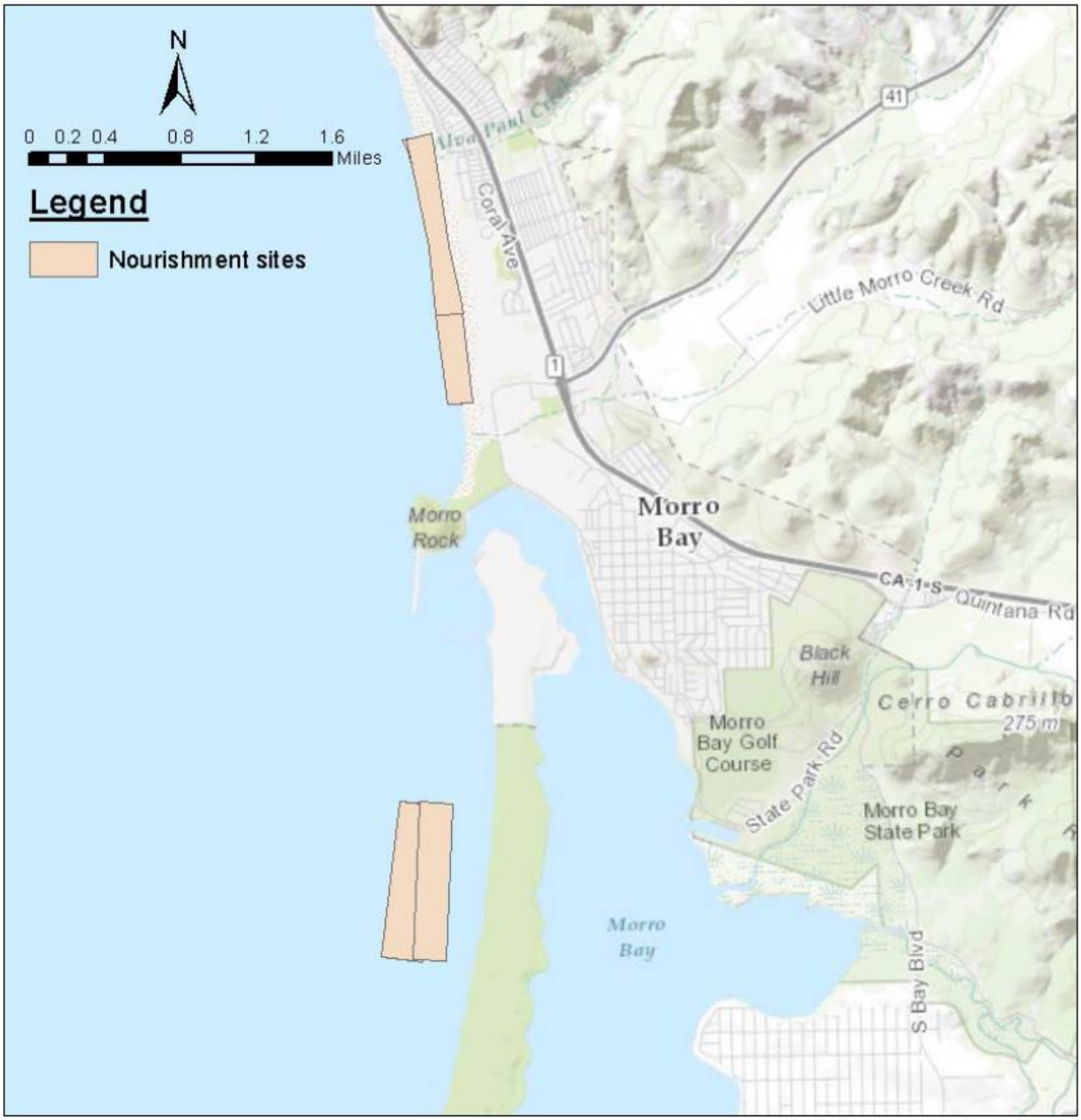
Placement in the surf zone at Morro Strand State Beach is associated with dredging of the Navy and Morro Channels. This occurs once a cycle within the six-year dredging program, and is performed with a hydraulic suction dredge. The site is located between Sienna Street and Morro Creek. The pipeline is placed perpendicular to the beach and extended into the surf zone.

Figure 12.1
Dredging in Morro Bay



Source: USACE 2016

Figure 12.2
Sediment Placement Sites in Morro Bay



Source: USACE 2016

SHORELINE PROTECTION

Most shoreline protection structures in the city are associated with original harbor and waterfront development activities in the 1930s and 1940s. The north breakwater and south jetty were constructed at the harbor entrance, and land was reclaimed along the existing Embarcadero with material dredged from the harbor and placed behind a rock seawall.

Shoreline protection in the city includes two coastal shoreline protective devices, a harbor entrance channel jetty system, and numerous structures along the bay waterfront. The location of these structures are shown in Figure 12.3. The function and need of these structures are discussed below (the numbers in the list below correspond with structure numbers in Figure 12.3).

1) Chevron bulkhead wall – This timber bulkhead wall just south of Toro Creek is associated with the Chevron marine terminal. A pier structure historically extended into the ocean from the wall at this location. The marine terminal is currently not in service and future plans for this land are unknown; therefore, the need for this structure is not known at this time.

2) Highway 1 revetment – This rock revetment is located at the toe of the earthen slope fronting Highway 1 just south of Toro Creek. This structure serves to protect the highway from bluff erosion. The highway is heavily traveled and provides a vital north–south transportation link to communities along the central coast.

3) Morro Rock revetment – This rock revetment serves to protect the northern edge of the Morro Rock parking lot. The revetment is commonly covered and uncovered with sand from seasonal beach shifts. The parking lot is heavily used by the public.

4) Dynegy power plant outfall structure – This rock revetment and wall are used to stabilize the water discharge feature from the power plant. The Dynegy power plant is no longer in service, and it has been reported that the outfall has silted in. A conduit within the outfall serves as the brine discharge from the City desalination plant. Future use of this site and the outfall structure is undetermined at this time.

5) Morro Bay Harbor jetty system – This system consists of a northern breakwater and southern rock jetty structures used to stabilize the Morro Bay entrance channel and provide safe passage for vessels. Morro Bay is a critical harbor of refuge and commercial fishing is an important local economic driver. The jetty system is owned and maintained by the USACE.

6) Coleman Drive revetment – This rock revetment shoreline protection extends from Morro Rock to Coleman Beach. Rock protection along this reach varies in both quantity and size, but seems to be scaled according to the waves and currents in a given area. The rock provides erosion protection of the earthen slopes from waves and tidal currents. Protected landside improvements include pedestrian/recreational amenities and Coleman Drive.

7) Embarcadero revetment and bulkhead walls – This consists of rock revetment and bulkhead walls of various design (e.g., concrete, steel sheetpile, timber). The walls protect the privately held backlands from erosion, and allow for access to floating docks via gangways and piers.

8) State Parks marina revetment – This rock revetment protection serves to stabilize the marina entrance and interior channel.

Figure 12.3
Shoreline Protection Structures in Morro Bay



12.2 PROJECTED CONDITIONS

NATURAL SHORELINE CONDITIONS

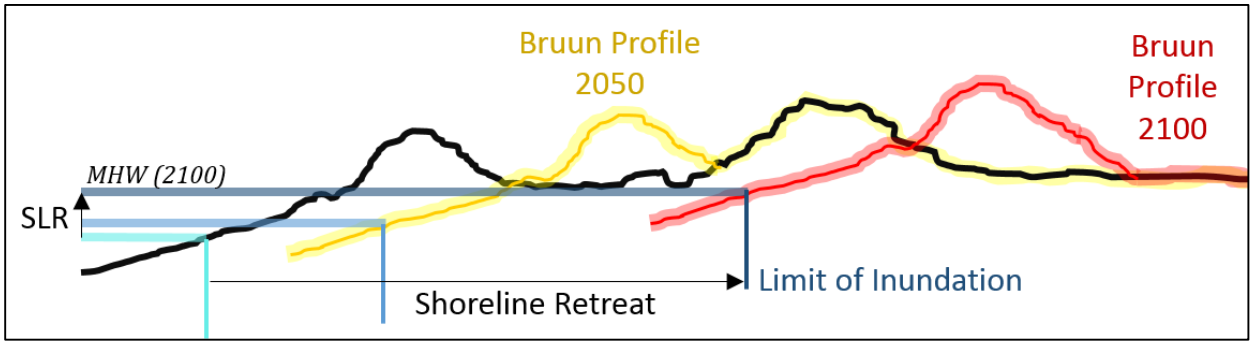
Historical trends in shoreline change indicate that the beaches in Morro Bay have been relatively stable and have accreted north of Morro Rock. The historically stable shoreline indicates an ability to recover from seasonal storm conditions, including strong El Niño events. The shoreline has also accommodated a historical sea level rise of about 8 inches over the past century, although sea levels have been relatively constant for the past 15 years (CCC 2015).

The projected shoreline conditions are expected to be similar to existing conditions in the near term. The shoreline will be subject to seasonal beach loss driven by winter storm waves, followed by beach recovery during calmer wave conditions in the summer months. This seasonal cycle can be exacerbated during El Nino events in which more frequent and larger wave events are often accompanied by elevated water levels.

The shoreline has shown an ability to adapt to the historical rate of sea level rise. However, projected rates of sea level rise are expected to accelerate, especially for time horizons beyond 2050. As the rate of sea level rise accelerates, it is unlikely the shoreline will be able to maintain its current position, and a trend of long-term erosion is expected to shape projected shoreline conditions.

A widely acknowledged impact of sea level rise is a landward and upward shift in the beach profile and shoreline position, which is predicted using a method known as the Bruun Rule. The rule assumes that, as mean sea level rises, the beach profile and the foredune are able to adjust upward and landward as sediment is conserved across the profile (Figure 12.4.). Using an approximate beach slope of 20:1 (horizontal to vertical) for Morro Bay, the average shoreline position would be expected to shift up and back 20 feet for every foot of sea level rise. The rule assumes that: 1) adequate sand exists in the system, and 2) sufficient space exists for the beach and dune system to migrate landward.

Figure 12.4
Beach Profile Change Due to Sea Level Rise

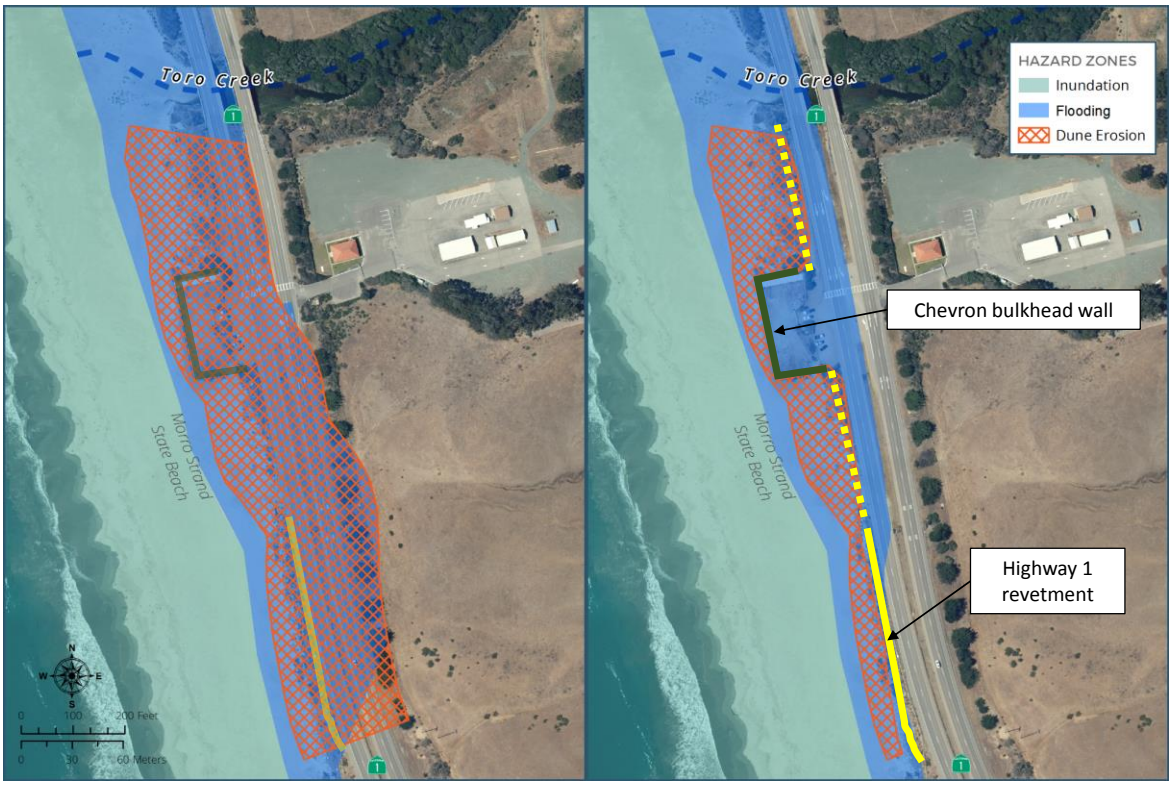


In instances where inadequate space exists for landward migration of the beach and dune, the shoreline would narrow, and the dune system would be more exposed to seasonal and storm-related erosion. This phenomena is known as the "coastal squeeze," and is the result of the beach system impinging on coastal development. The consequence is a loss of beach and dune habitat, recreational beach area, and reduced storm protection for development landward of the dunes.

PROTECTED SHORELINE CONDITIONS

Protected shorelines on the open coast, such as the Chevron seawall and Highway 1 revetment south of Toro Creek, will experience increased scour due to beach loss and increased wave heights due to elevated water levels. These projected conditions could undermine or destabilize these structures, extending the coastal hazard zones farther landward (Figure 12.5).

Figure 12.5
Effect of Shore Protection on 2030 Coastal Hazards



Without Shore Protection **With Shore Protection**

The Morro Rock revetment along the north side of the parking area is oriented perpendicular to the shore and is expected to experience increases in wave energy due to similar factors. Increased toe scour would be expected as the beach profile migrates landward, and increased wave heights can be expected due to higher water levels along the toe of the structure. These projected conditions could have a destabilizing effect on the existing structure with wave run-up and overtopping of the structure becoming more frequent.

The Morro Bay Harbor jetty system will be subject to increased wave heights in the future due to the effects of sea level rise. These jetty structures, particularly the north breakwater, are subject to impact from large waves and require frequent repair to maintain functionality. As sea levels rise, increased wave energy on the jetty structures is anticipated, which will likely result in further, significant damage and reduce the functionality of these structures.

Both the north and south jetty systems are rubble mound structures, and as such can sustain significant damage and continue to provide protection. However, with increasing wave energy impacts as a result of sea level rise, it is likely that these structures will require extensive maintenance and repair work by the USACE in the future.

Protected shorelines in Morro Bay, such as the Coleman Drive and Embarcadero revetments, will experience elevated water levels that will focus tidal currents higher up on the banks. These structures are constantly subject to flood and ebb tidal currents and, over time, the rock facing has been undercut, resulting in some displacement of rock from the upper bank to fill voids in the lower bank. Numerous locations were observed along the upper bank to have unprotected fill material that will become more vulnerable to erosion as sea levels rise.

Development along the Morro Bay Embarcadero waterfront is located alongside or on top of existing rock revetments and bulkhead structures along this shoreline. The continued use of this land is dependent upon these structures' ability to hold the line against the rising tides. Routine inspection, maintenance, and repair of these structures will be required in the future to hold the line and maintain current functionality.

12.3 REGULATORY SETTING

FEDERAL AGENCIES

NOAA Fisheries

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, NOAA Fisheries must be consulted on any potential impacts to Essential Fish Habitat. Essential Fish Habitat includes all tidal waters; therefore, future shoreline management and protection actions in tidal waters will require consultation with NOAA Fisheries.

US Army Corps of Engineers

Any shoreline management or protection action that involves the placement of structures or sand below the high water line requires a permit from the USACE under Section 404 of the Clean Water Act. Any project that places structures or sand below the mean high tide line or that involves dredging requires a permit from the USACE under Section 10 of the Rivers and Harbors Act. For projects below the mean high tide line, the USACE processes the Section 10 and Section 404 permits together.

US Fish and Wildlife Service

Under Section 7 of the Federal Endangered Species Act, a federal agency must consult with the US Fish and Wildlife Service for any project that has the potential to affect a federally listed threatened or endangered species. Species of concern for shoreline management and protection activities in Morro Bay include the snowy plover and least terns.

STATE AGENCIES

California Coastal Commission

The California Coastal Act requires cities and counties in coastal California to prepare local coastal programs that provide ground rules for future development and protection of resources in the coastal zone. The California Coastal Commission (CCC) Sea Level Rise Policy Guidance (CCC 2015) lays out the following guiding principles for addressing the challenge of rising sea levels:

- Use science to guide decisions.
- Minimize coastal hazards through planning and development standards.
- Maximize protection of public access, recreation, and sensitive coastal resources.
- Maximize agency coordination and public participation.

The CCC has taken a position against hard structure alternatives for shore protection. To receive a concurrence that an alternative involving a hard structure is consistent with the California Coastal Act, it will be necessary to demonstrate that the structure is necessary to protect existing structures and beach-dependent uses, and that nonstructural alternatives are not feasible.

Regional Water Quality Control Board

Any project that requires a Section 404 permit from the USACE must also obtain a Water Quality Certification under Section 401 of the Clean Water Act from the Regional Water Quality Control Board. Morro Bay lies within the jurisdiction of the Central Coast Regional Water Quality Control Board.

California State Lands Commission

The state of California owns state tidelands, which generally are all lands seaward of the mean high tide line. This includes the waterside infrastructure along the Morro Bay Embarcadero that supports commercial fishing and recreational boating activities. If a

project extends into state lands, a letter of concurrence for the project will need to be obtained from the California State Lands Commission.

12.4 PRIORITY FINDINGS

NATURAL SHORELINE CONDITIONS

Projected shoreline conditions will strain the natural beach and dune system that provides habitat for endangered species and storm protection for existing development. A key challenge in future shoreline management will be protecting and preserving the benefits of the sandy beach and dune system that will become squeezed between a migrating shoreline and existing development. These impacts could be partially offset by shoreline management efforts, including beach nourishment and dune restoration. However, as sea levels rise, channels in the bay will become more navigable, which may reduce the frequency and amount of maintenance dredging performed by the USACE. The City may need to develop a funding mechanism for such management measures to preserve these coastal resources.

EXISTING SHORELINE PROTECTION STRUCTURES

Existing shoreline protection structures will also be stressed as the beach profile migrates landward and wave heights impacting the structures increase with sea level rise. Several existing structures subject to increased wave forces such as the Chevron bulkhead wall, Highway 1 revetment, and harbor entrance jetty system are not City-owned. However, many of these structures provide protection for important infrastructure, facilities, and services that are key to the city's function. Stakeholder outreach will be necessary so that all parties understand the future hazards and risks associated with sea level rise and can develop a coordinated approach to implementing adaptation measures.

13.0 TRANSPORTATION AND MOBILITY



13.0 TRANSPORTATION AND MOBILITY

This chapter identifies existing transportation and mobility conditions in the planning area and summarizes applicable regulations for transportation facilities. This includes conditions related to driving, walking, bicycling, and transit in the city as well as parking and coastal access. The existing transportation system assessment is used to identify existing needs and provide a context for potential circulation goals and objectives. The City historically has assessed vehicular transportation in terms of level of service (LOS), which measures the average delay experienced by drivers. Legislation in California has changed allowable transportation metrics from LOS to vehicle miles traveled (VMT).

13.1 EXISTING CONDITIONS

AUTOMOBILES

Roadway Classifications

Roadways are typically classified according to how their planned functions provide access and mobility. Federal transportation regulations define a classification system, but local jurisdictions can define different functional classifications if desired. Roadways are typically classified as follows:

- Freeways are intended to carry high volumes and high speed traffic. Access is limited with grade-separated interchanges accommodating flows to and from the freeway mainline. Freeways are designed to maximize mobility, not to serve abutting land uses. The segment of Highway 1 in Morro Bay between South Bay Boulevard and Atascadero Road operates as a freeway.

- Expressways are high volume and high speed facilities with access provided at controlled at-grade intersections. Expressways emphasize mobility and are not intended to serve abutting land uses. The segment of Highway 1 in Morro Bay from Yerba Buena Street north to the city limits operates as an expressway.

- Arterials balance mobility and access, carrying moderate volumes at lower speeds and serving abutting land uses. Main Street, Morro Bay Boulevard, and the segments of State Route (SR) 41 in Morro Bay east of Highway 1 operate as arterials. Arterials can also be divided into principal and minor arterials. Principal arterials serve more vehicles and have wider shoulders than minor arterials. Principal arterials can also have a median and partial access controls, while minor arterials always lack a median and have uncontrolled access.

- Collectors gather traffic from local roads and tie into the arterial roadway network. Collector roadways often pass through residential areas and may have direct driveway access connected to individual residential parcels. Collectors can be divided into major and minor collectors, with the principal distinction between qualitative differences about their distance and the types of land uses served.

- Local roads provide access to abutting land uses and connect to the collector and arterial street network. Local roads typically constitute the largest percentages of roadways in terms of mileage.

Figure 13.1 shows the functional classifications of roadways in the planning area according to the California Department of Transportation (Caltrans 2016) and the Federal Highway Administration. In some cases the functional classifications used by Caltrans as shown on Figure 13.1 differ from the generic descriptions provided above.

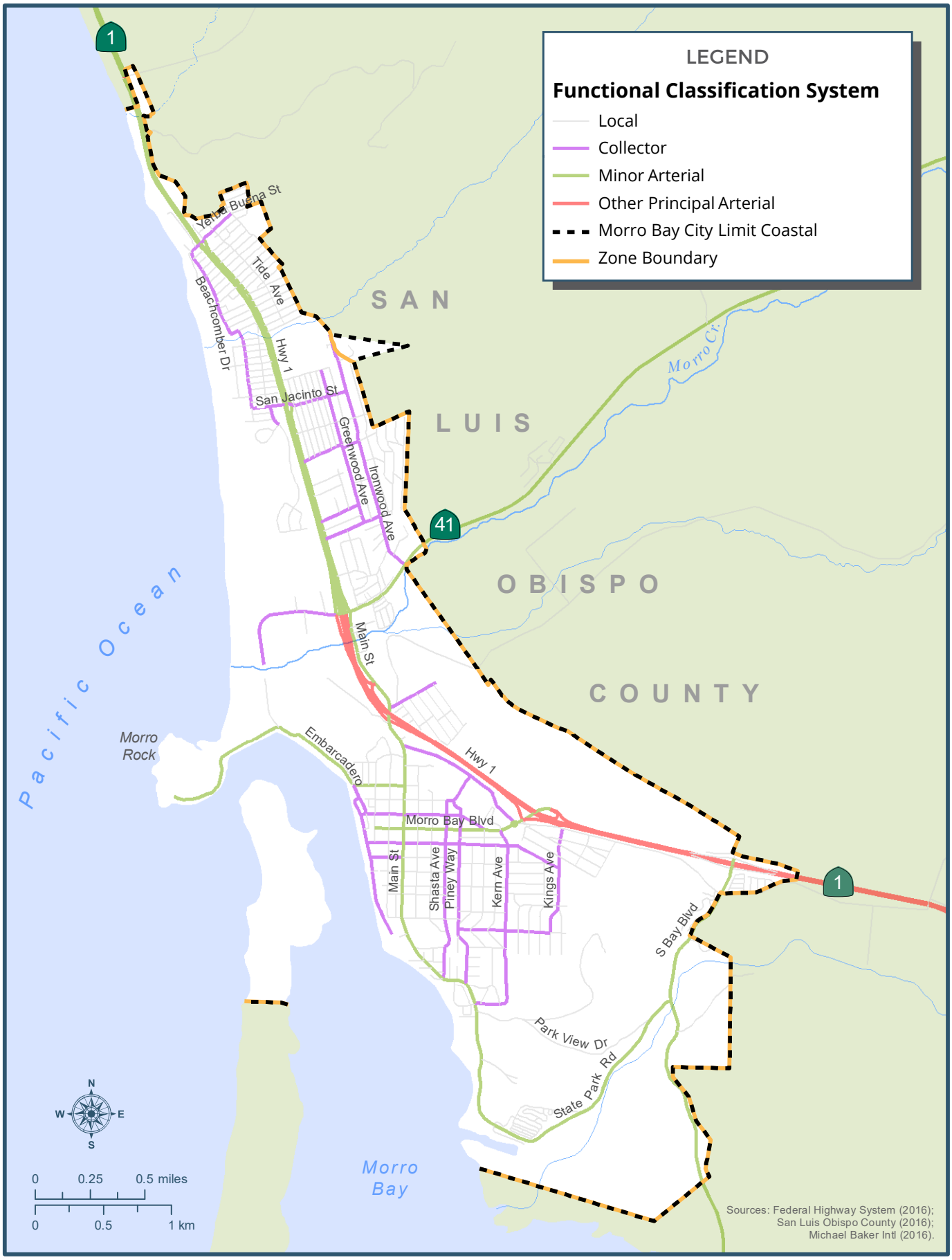


FIGURE 13.1

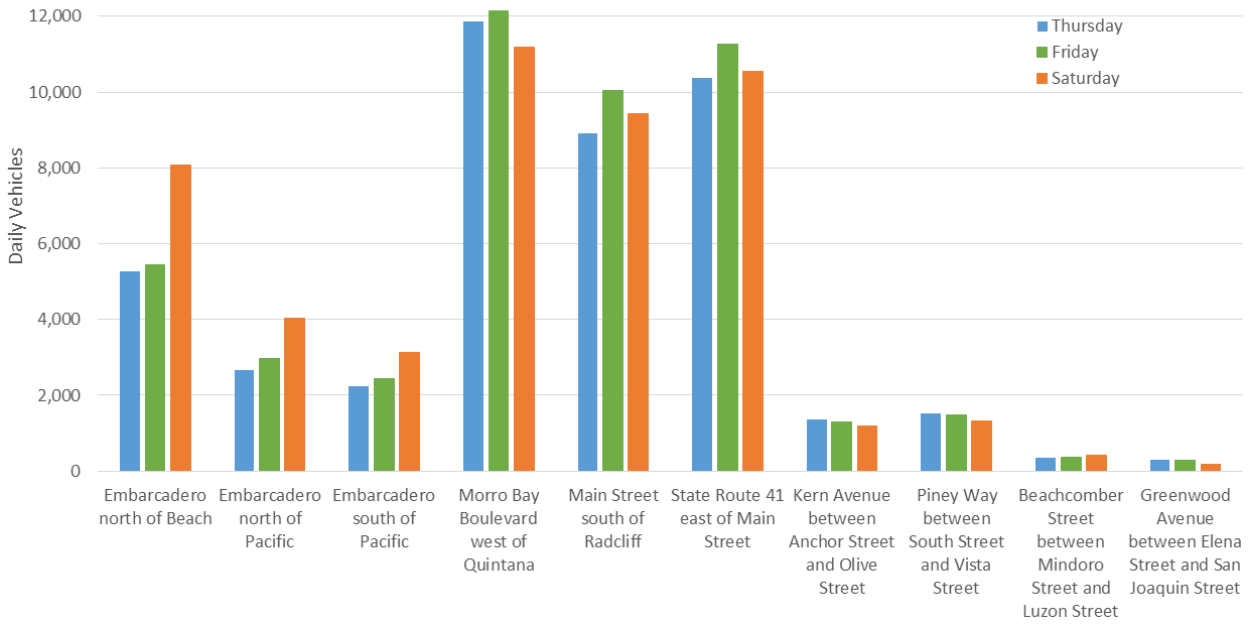
Functional Classification Map

Page 2

Daily Traffic Variation

Daily traffic counts were collected on a Thursday, Friday, and Saturday in March 2016 and are summarized in Figure 13.2. The Embarcadero showed the largest daily variation due to tourist traffic on Saturday, whereas traffic on Morro Bay Boulevard, Main Street, and SR 41 were highest on Friday. Neighborhood streets showed relatively consistent volumes on Thursday, Friday, and Saturday.

Figure 13.2
Daily Traffic Volumes, March 2016



Automobile Intersection Operations

Automobile intersection operations are typically described in terms of average delay experienced per vehicle during the peak hour of travel. The delay per vehicle correlates to an LOS grade ranging from LOS A for free-flowing conditions to LOS F for highly congested conditions. The City does not have a formal LOS threshold defining acceptable operations, but historically has applied the Caltrans target of LOS C or better. Refer to Appendix D for further details on LOS thresholds and calculation sheets.

Operations at key intersections in the city in March 2016 are shown below during the Saturday midday and weekday p.m. peak hours (Table 13.1).

Table 13.1
Level of Service at Key Intersections (2016)

Intersection	Peak Hour	V/C[1]	Delay[2]	LOS
1. San Jacinto Street/Highway 1	Weekday p.m.	0.56	18.2	B
	Sat midday	0.46	17.1	B
2. San Jacinto Street/Main Street	Weekday p.m.	-	6.7 (13.9)	A (B)
	Sat midday	-	5.0 (10.0)	A (A)
3. State Route 41/Highway 1 SB Ramps	Weekday p.m.	0.4	7.5 (**28.7**)	A (**D**)
	Sat midday	0.3	6.7 (18.2)	A (C)
4. State Route 41/Main Street	Weekday p.m.	0.99	**37.6**	**E**
	Sat midday	0.82	**28.3**	**D**
5. Beach Street/Main Street	Weekday p.m.	0.52	13.9	B
	Sat midday	0.75	23.9	C
6. Morro Bay Boulevard/Quintana Road	Weekday p.m.	0.7	12.7	B
	Sat midday	0.59	10.7	B

[1] V/C refers to volume to capacity ratio reported for worst movement.

[2] Delay refers to the HCM 2010 average control delay in seconds per vehicle. Side-street stop-controlled intersections report the worst approach's delay and LOS in parentheses next to the overall intersection delay.

*Intersections or movements operating at LOS D or worse are shown in **bold** text.*

The intersection of SR 41/Main Street operates at LOS E during the weekday p.m. peak hour and LOS D during the Saturday midday hour peak hour. These are below the Caltrans target of LOS C or better. This all-way stop-controlled intersection and nearby ramps are currently under study for improvements through the Caltrans project development process. The southbound approach to the SR 41/Highway 1 southbound ramps operates at LOS D during the weekday p.m. peak hour. All other intersections perform at or above LOS C.

Roadway Segment Operations

Roadway segment operations in 2016 are described for pedestrians, bicycles, and vehicles in Table 13.2. The Embarcadero north of Pacific Street, Morro Bay Boulevard west of Quintana Road, and Main Street south of Radcliff Drive are short segments, with a high number of stops per mile, decreasing their auto performance. Main Street south of Radcliff Drive and westbound SR 41 east of Main Street have high free-flow speeds

and no sidewalks, resulting in pedestrian LOS D. All other segments perform at or above LOS C. The City and Caltrans do not have LOS thresholds for pedestrian and bicycle facilities.

Table 13.2
Roadway Segment Operations (2016)

Segment	Peak Hour	Direction	Ped Score	PLOS	Bike Score	BLOS	Auto V/C Ratio	Auto Score	ALOS
Embarcadero - north of Beach Street	Weekday PM	NB	2.10	B	4.00	B	0.10	3.28	C
		SB	1.51	A	2.76	C	0.10	3.02	C
	Sat Mid-day	NB	2.48	B	3.02	C	0.18	3.28	C
		SB	1.77	A	2.97	C	0.15	3.02	C
Embarcadero - north of Pacific Street	Weekday PM	NB	1.32	A	2.86	C	**0.08**	**3.72**	**D**
		SB	1.16	A	2.74	B	**0.07**	**3.72**	**D**
	Sat Mid-day	NB	1.51	A	3.38	C	**0.09**	**3.72**	**D**
		SB	1.43	A	3.46	C	**0.10**	**3.72**	**D**
Embarcadero - south of Pacific Street	Weekday PM	NB	1.13	A	2.54	B	0.05	3.28	C
		SB	1.12	A	2.68	B	0.06	3.28	C
	Sat Mid-day	NB	1.32	A	3.12	C	0.07	3.28	C
		SB	1.27	A	3.12	C	0.07	3.28	C
Morro Bay Boulevard - west of Quintana Road	Weekday PM	EB	2.37	B	2.43	B	**0.24**	**3.62**	**D**
		WB	2.53	B	2.50	B	**0.28**	**3.62**	**D**
	Sat Mid-day	EB	2.27	B	2.38	B	**0.22**	**3.62**	**D**
		WB	2.47	B	2.47	B	**0.26**	**3.62**	**D**
Main Street - south of Radcliff Drive	Weekday PM	NB	2.56	B	2.34	B	0.17	3.28	C
		SB	**3.79**	**D**	2.48	B	0.23	3.02	C
	Sat Mid-day	NB	3.04	C	2.58	B	0.25	3.28	C
		SB	**3.94**	**D**	2.55	B	0.24	3.02	C
State Route 41 - east of Main Street	Weekday PM	EB	3.39	C	0.75	A	0.23	3.16	C
		WB	3.32	C	0.71	A	0.22	3.16	C
	Sat Mid-day	EB	3.31	C	0.71	A	0.21	3.16	C
		WB	**3.56**	**D**	0.82	A	0.26	3.16	C

Scores and LOS refer to the HCM 2010 methods for calculating segment performance.
*Segments with LOS D or worse operations are shown in **bold** text.*

Neighborhood Traffic

There are a variety of different neighborhood types throughout Morro Bay. Most neighborhoods are served by a well-defined grid of local streets. This grid system spreads traffic by providing a variety of routes to destinations.

Some collector streets pass through residential areas. While traffic volumes along these corridors are well below the roadway's carrying capacity, the adjacent residences can be impacted by excessive vehicle volumes and speeds. Table 13.3 summarizes the volumes and speeds along key neighborhood roadway corridors in 2016.

Table 13.3
Neighborhood Roadway Traffic Conditions (2016)

Segment	Day	Daily Traffic	Average Daily Traffic	85th Percentile Speed (mph)	Average 85th Percentile Speed (mph)
Kern Avenue - Anchor Street to Olive Street	Thursday	1,365	1,277	23.9	29.9
	Friday	1,285		33.0	
	Saturday	1,181		32.7	
Piney Way - South Street to Vista Street	Thursday	1,524	1,440	32.7	32.6
	Friday	1,470		32.7	
	Saturday	1,326		32.5	
Beachcomber Street - Mindoro Street to Luzon Street	Thursday	355	375	28.0	26.5
	Friday	353		26.4	
	Saturday	416		25.0	
Greenwood Avenue - Elena Street to San Joaquin Street	Thursday	307	258	26.3	25.5
	Friday	287		25.9	
	Saturday	180		24.4	

Source: CCTC 2016

The roadways listed in Table 13.3 are classified as major collectors in the California Road Systems maps. However, they meet the criteria for a residential district as defined in Section 515 of the California Vehicle Code, and therefore have a prima facie speed limit of 25 mph. The segments of Kern Avenue and Piney Way show 85th percentile speeds of 29.9 and 32.6 mph, respectively.

Goods Movement

Local businesses rely on roadways and other City infrastructure, such as piers, to transport goods. The following roadways, shown on Figure 13.3, are identified as truck routes in the City's Circulation Element:

- Main Street from Yerba Buena Street to Morro Bay Boulevard
- SR 41/Atascadero Road east of Highway 1
- Quintana Road from Main Street to Morro Bay Boulevard and east of South Bay Boulevard
- Morro Bay Boulevard from Main Street to Highway 1
- Beach Street from the Embarcadero to Main Street
- Harbor Street from the Embarcadero to Main Street
- Highway 1 through the City

Downtown and Embarcadero area businesses receive deliveries from trucks parked on curbside spaces, off-street lots, or in designated loading zones. Community members have also expressed concern about delivery trucks occasionally parked in the middle of streets, which can create or exacerbate congestion.

Commercial fishing and aquaculture offloading occurs at a number of piers along the Embarcadero. The City operates a launch ramp facility, fish cleaning station, and wash-down area for trailered vessels. No facilities are provided for large vessel haul-outs. For more information about commercial fishing and aquaculture facilities, see Chapter 7, Land Use, Community Form, and Coastal Uses.

Vehicle Miles Traveled

VMT measures travel on roadways by all types of motorized vehicles carrying passengers or cargo. Each mile traveled is counted as one vehicle mile regardless of the number of people in the vehicle. VMT is typically expressed as VMT per day. Table 13.4 shows daily VMT in Morro Bay as of 2016. In this table, the column titled "Daily VMT in SOI" reflects the vehicle miles traveled entirely within city limits and the City's sphere of influence. The column titled "Daily VMT in the County" reflects the vehicle miles traveled within the City's

sphere of influence and those trips that either originated in San Luis Obispo County and concluded in Morro Bay, or vice versa. The final column, "Daily VMT in State," reflects vehicle miles traveled within the City's sphere of influence, and those trips that either originated in Morro Bay and concluded anywhere in California (including San Luis Obispo County), or vice versa.

Table 13.4
Vehicle Miles Traveled in Morro Bay (2016)

Trip Type	Daily VMT in SOI	Daily VMT in County	Daily VMT in State
Origin and destination within City SOI	52,256	52,256	52,256
Origin only within City SOI	16,061	50,924	66,688
Destination only within City SOI	16,422	48,024	63,788
Total	84,739	151,205	182,732

Note: SOI is sphere of influence, which includes the City limits as well as land under County jurisdiction and indicates the reasonable limits of future growth or a boundary for providing municipal services.

Daily vehicle miles traveled were extracted from the SLOCOG Travel Demand Model and calibrated to match local conditions. Through trips passing through Morro Bay but not stopping are excluded. Trips external to San Luis Obispo County have been adjusted to reflect typical trip lengths from the California statewide model.

Daily VMT is shown for trips with both an origin and destination within the city and trips with either an origin or destination in the city, but not both. A Morro Bay resident driving to dinner on the Embarcadero would have an origin and destination within the city. A Morro Bay resident driving to work in Paso Robles would have an origin only within the city, while an Atascadero resident driving to work in Morro Bay would have a destination only within the city. A Fresno resident visiting Morro Bay would have a destination only within the city, and the trip length and VMT would be adjusted to reflect the portion of the trip occurring outside of San Luis Obispo County.

VMT estimates were extracted from the SLOCOG Travel Demand Model calibrated for use in Morro Bay. The SLOCOG Model tracks trips within the county, but does not reflect regional trips that continue to destinations outside of the county. The California statewide model was used to determine the average trip lengths for trips leaving San Luis Obispo County, which were then used to forecast the daily VMT.

Trips with an origin and destination in the city were counted as being 100 percent generated by the city. Trips that have an ending or beginning in the city were counted as being 50 percent generated by the city. Trips that pass through the city but do not begin or end within the city were excluded from the VMT analysis.

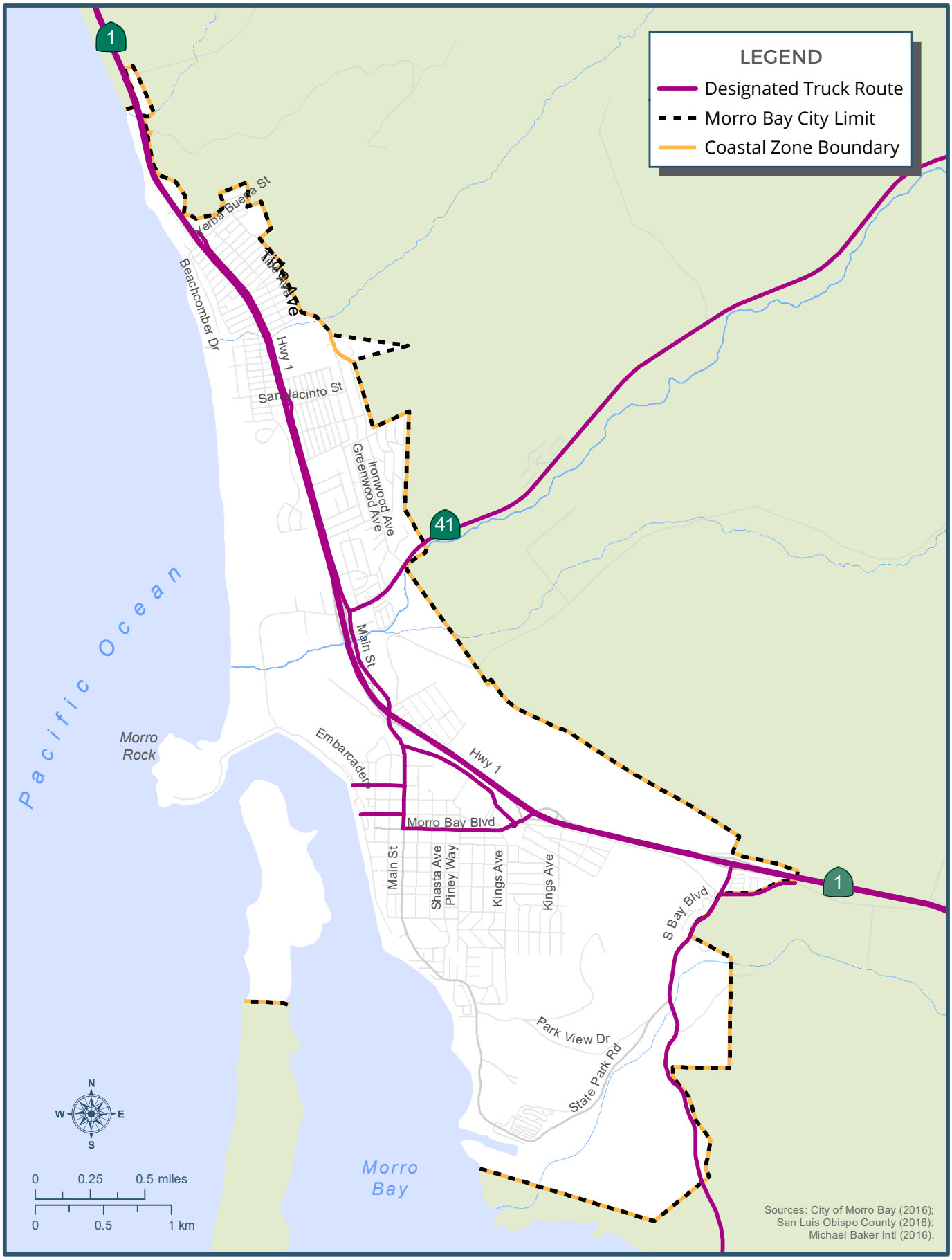


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FIGURE 13.3

Truck Routes

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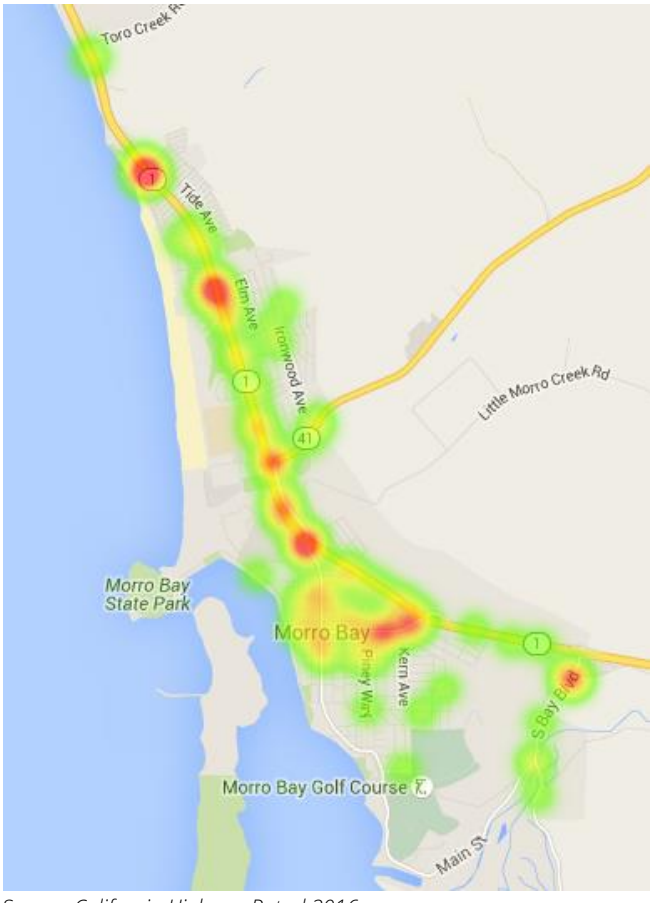
Collisions

The Statewide Integrated Traffic Records System (SWITRS) is a tool used by the California Highway Patrol to collect and process collision information. Figure 13.4 shows injury and fatal collision hot-spots (including vehicles, pedestrians, and bicyclists) throughout the city based on five years of collision data. Most of the collisions occur at intersections along Highway 1 and along the Main Street and Morro Bay Boulevard corridors.

The California Office of Traffic Safety compares collision rates for cities throughout the state. There are 105 cities in Morro Bay's category with a population between 10,001 and 25,000. In 2013, Morro Bay's fatal and injury collision rank was 43 of 105, indicating that 42 similar-sized cities had higher collision rates and 62 had lower rates.

Figure 13.4
Injury and Fatal Collision Locations (2009–2013)



Source: California Highway Patrol 2016

The 10 intersections with the largest number of reported collisions are summarized in Table 13.5. Where these intersections overlap with the intersections identified in the current General Plan, those values (for the period 1982–1984) are provided as well.

Table 13.5
High Collision Locations in Morro Bay (2012–2014)

Intersection	2012	2013	2014	Total	1982–1984
Highway 1/Main Street	2	5	5	12	-
Quintana Road/South Bay Boulevard	5	3	4	12	2
Quintana Road/Main Street	3	2	4	9	5
Highway 1/Yerba Buena Street	3	4	2	9	4
Highway 1/San Jacinto Street	1	5	2	8	9
Highway 1/Morro Bay Boulevard	3	3	2	8	-
Quintana Road/Morro Bay Boulevard	2	2	3	7	7
Main Street/Morro Bay Boulevard	2	3	2	7	-
Main Street/SR 41	2	4	1	7	-
Embarcadero/Embarcadero	2	3	2	7	-

Source: California Highway Patrol 2014; City of Morro Bay 1988

SWITRS does not provide a precise location for all collisions, so it is unclear where the collisions at the Highway 1 intersections with Main Street and Morro Bay Boulevard occurred.

Five locations analyzed in the 1988 General Plan are also in the top 10 collision locations between 2012 and 2014. The number of reported collisions increased at three of these intersections, and stayed the same or decreased at two locations, despite traffic volume increases.

Parking

The City prepared a Parking Management Plan in 2007, which focused on parking conditions Downtown and along the Embarcadero. Nearly 2,500 parking spaces are located in this study area. Of these, more than 70 percent are managed by the City. Occupancy surveys were also conducted from noon to 6:00 p.m. on a Tuesday preceding Memorial Day and Saturday of Memorial Day weekend of that year.

The occupancy surveys showed that parking on the Embarcadero was fully utilized and several Downtown blocks were nearly fully utilized during the peak hour of the holiday weekend. The high parking occupancy rates were short in duration and supply was

available within four blocks of all surveyed areas at all times, even during a holiday weekend.

The study developed an action plan to address the temporary supply issues present during busy weekends and more effectively manage the City's parking supply. The action plan includes the following recommendations:

1) Enhance the signage program to better direct drivers to the appropriate parking areas.

2) Improve public information related to parking for different users.

3) Encourage shared parking between different land uses.

4) Encourage employee parking policies to support parking availability for visitors.

5) Expand and enhance trolley service.

6) Regulate delivery truck parking.

7) Replace parallel parking with angled parking in selected areas.

8) Enhance pedestrian facilities with a focus on connections to parking and attractions.

9) Modify time limits to more effectively utilize the parking supply.

10) Encourage public-private partnerships to effectively provide parking.

11) Monitor and adjust the Parking In-Lieu Fee program.

12) Allow the provision of pervious parking surfaces to minimize stormwater runoff.

The City is implementing the action plan as opportunities arise. As recently as June 28, 2016, the Morro Bay City Council was considering approaches to prevent parking requirements from negatively impacting economic development.

Coastal Zone Access and Parking

Public parking provides access to the Coastal Zone at numerous locations in Morro Bay. More than 2,200 free public parking spaces are provided by the City in the Coastal Zone. The primary public access points are described below and shown on Figure 13.5.

- North Point Natural Area, located at the north end of Toro Lane, provides 10 marked vehicle parking spaces on the bluff connecting to stairways and trails to the beach. These parking spaces are occasionally fully utilized, but additional curbside parking is nearby in the Morro Strand campground area.
- Beachcomber Street provides approximately one-half mile of curbside parking (roughly 100 spaces) on the bluffs above the Morro Strand campground. These spaces are frequented by surfers and other beachgoers.
- The Morro Strand campground provides five marked parking spaces for day use in addition to the camp sites.
- Beachcomber Street offers curbside parking and two informal off-street parking areas south of Alva Paul Creek.
- An off-street parking lot at the end of Azure Street provides approximately 30 parking spaces as well as a restroom for beachgoers. This parking lot connects to the Cloisters trail network.
- The Cloisters Community Park offers 28 off-street parking spaces serving the park and multiuse trails providing beach access.
- Informal dirt parking lots and curbside parking are situated along the Embarcadero north of Morro Creek. A bicycle and pedestrian bridge crosses Morro Creek to connect with the Harborwalk path.
- A dirt parking lot is located at the end of the Embarcadero just south of Morro Creek. This lot also offers parking for bikes and surreys.
- Numerous parking areas are along Coleman Drive between the Embarcadero and Morro Rock. These provide access to the Harborwalk, basketball courts, small craft launch sites at Coleman Beach, Morro Rock, and other amenities in the area. Most of the parking areas consist of dirt lots. The lot closest to the harbor mouth is closed to vehicles during high surf for public safety.

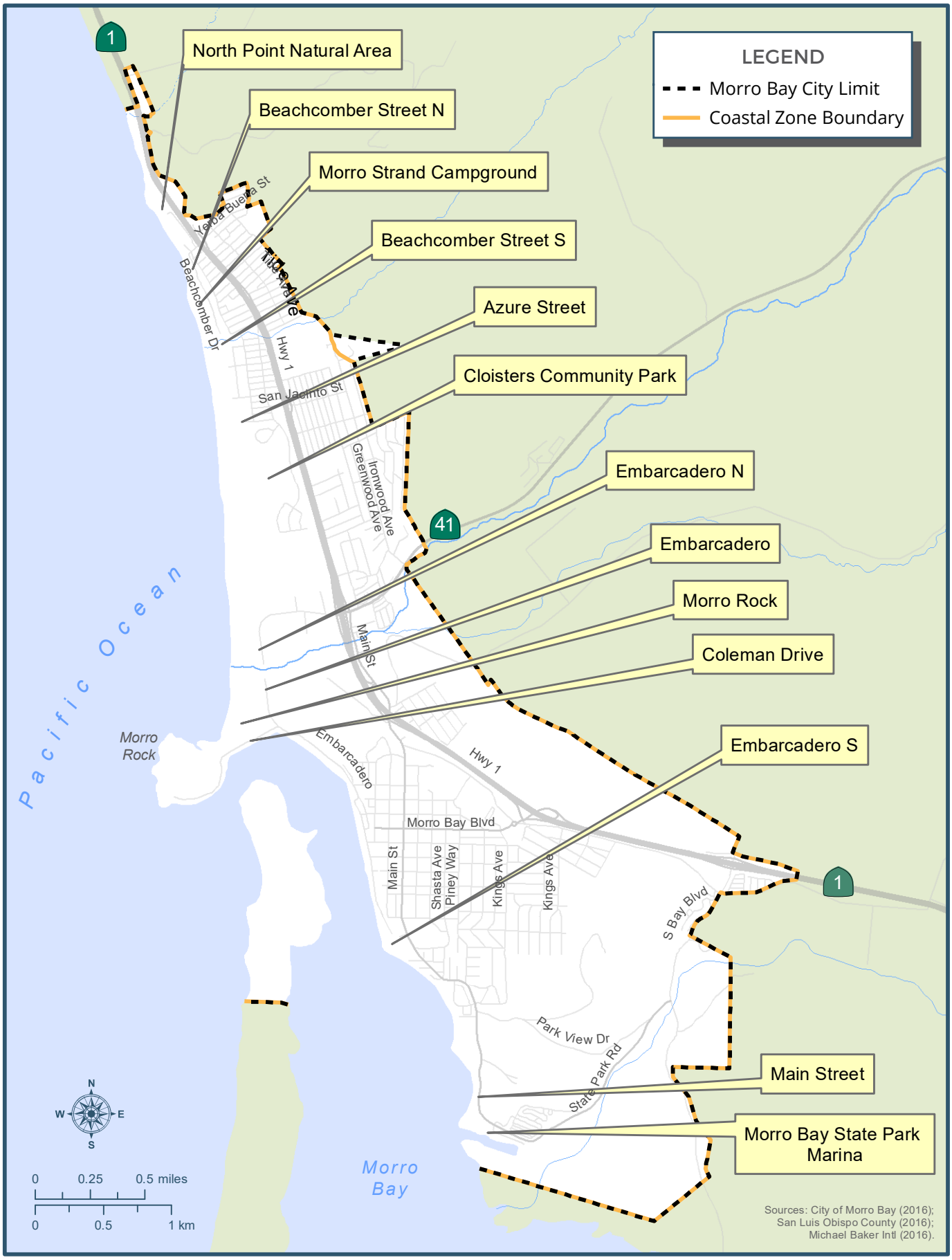


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FIGURE 13.5

Primary Public Coastal Access

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- Parking supply and demand along the Embarcadero south to the launch ramp are discussed in detail in the 2007 Parking Management Plan.
- An informal dirt parking area accommodating approximately 12 vehicles is situated on Main Street north of the Museum of Natural History. This lot is regularly used as a launching point for small boats.
- A paved parking lot is located at the Morro Bay State Park Marina serving the general public and vessel owners. This lot also provides access to estuary walking trails.

Free parking is provided at all coastal access parking locations.

WALKING AND BICYCLING

The City's well-established grid network, mild weather, and relatively flat topography support walking and biking. The *Morro Bay Bicycle and Pedestrian Master Plan* (2011) describes existing conditions and identifies goals, objectives, and planned improvements to serve these modes of travel.

The American Community Survey estimates that in 2014, 4.5 percent of working-age residents in Morro Bay walked to work, 1.4 percent biked to work, and 72.8 percent drove alone to work.

Walking

Pedestrian facilities consist of sidewalks, Class I paths, and crosswalks. Sidewalks are provided along the Embarcadero and along most streets in the Downtown area. Most single-family residential areas in the city lack sidewalks. Section 12.04.010 of the Municipal Code requires that new developments conform to the City's Standard Drawings and Specifications (City of Morro Bay 1987), which require sidewalks for commercial, industrial, and high-density residential uses as well as on arterial, local, and collector roads not bordered by one or more of these land uses. Hillside streets in R1/R2 zoning are required to provide a flat, walkable surface on one side of the road.

Crosswalks

There are four types of crosswalks in the city. Signalized crossings provide marked crosswalks and pedestrian signal heads. The three signalized intersections in the city provide signalized crossings on at least two legs of the intersection.

Controlled marked crossings provide striped crosswalks with a stop or yield sign on at least one leg of the intersection. There are 44 controlled marked crossings in the city, mostly in the Downtown area. There are two controlled marked crossings across Highway 1, one at San Jacinto Street and a second at Yerba Buena Street. A crosswalk, green bike lane striping, and Rectangular Rapid Flash Beacon were recently installed near the Atascadero Road/Highway 1 southbound ramp intersection. This area experiences high pedestrian volumes due to the proximity of the high school and nearby hotels.

Uncontrolled marked crossings provide striped crosswalks at mid-block and uncontrolled locations.

Unmarked crossings constitute the remainder of crosswalks wherever two public roads intersect, per the California Vehicle Code.

The Harborwalk provides a multi-use bicycle and walking path connecting the Embarcadero to Morro Rock. This path is heavily used by locals and visitors.

Trails

The California Coastal Trail is a hiking trail that spans from Oregon to Mexico. The California legislature formally established the trail in 2001 and provided a general alignment. There are no current specific alignments planned for the City, nor are there any trails designated as the California Coastal Trail. Additional recreational hiking trails are provided in Morro Bay State Park. These include the Black Hill hiking areas and walking paths along the estuary near the State Park marina.

Schools

Greenwood Avenue was identified prior to 2004 as the primary walking route to the city's only elementary school, Del Mar Elementary. No sidewalks are provided on Greenwood Avenue, causing pedestrians to walk in the roadway. In 2011 the City and stakeholders

applied unsuccessfully for grant funding for segment improvements through the Cycle 3 Federal Safe Routes to School Grants program. Funding for improvements to this segment has not yet been identified.

Morro Bay High School is connected to the beach tract by a Class I path. Many students walk through the Main Street/SR 41/Atascadero Road intersection, which is congested during peak hours. Recent pedestrian and bicycle improvements to the Highway 1 Southbound Ramps/Atascadero Road intersection have improved conditions for student cyclists and pedestrians.

Bicycling

Bicycle facilities are described in four classes of facilities:

- Class I bikeways provide a completely separate right-of-way for the exclusive use of bicycles and pedestrians with a minimum of vehicular cross-flow. The Harborwalk path is an example of a Class I facility. Approximately 3.6 miles of Class I facilities exist in the city.
- Class II bike lanes consist of a striped lane for one-way bicycle travel on a street or highway. Approximately 7.1 miles of Class II bike lanes exist in the city.
- Class III bike routes are shared by motorists and bicyclists. These routes are supplemented with signs and pavement legends including sharrows. The section of Beachcomber Street south of Yerba Buena Street is an example of a Class III bike route with sharrows.
- Class IV bike lanes, often called cycle tracks or protected bike lanes, are exclusive bike facilities physically separated from vehicles. Types of separation include grade separation, flexible posts, physical barriers, or on-street parking. No Class IV bike lanes currently exist in Morro Bay.

Figure 13.6 shows existing bike facilities in Morro Bay and Figure 13.7 shows the future bike and pedestrian facilities proposed in the city's *Bicycle and Pedestrian Master Plan* (2011). The California Pacific Bike Route connects Vancouver, British Columbia, to Imperial Beach, California, and follows Highway 1 through Morro Bay.

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FIGURE 13.6

Existing Bicycle Facilities

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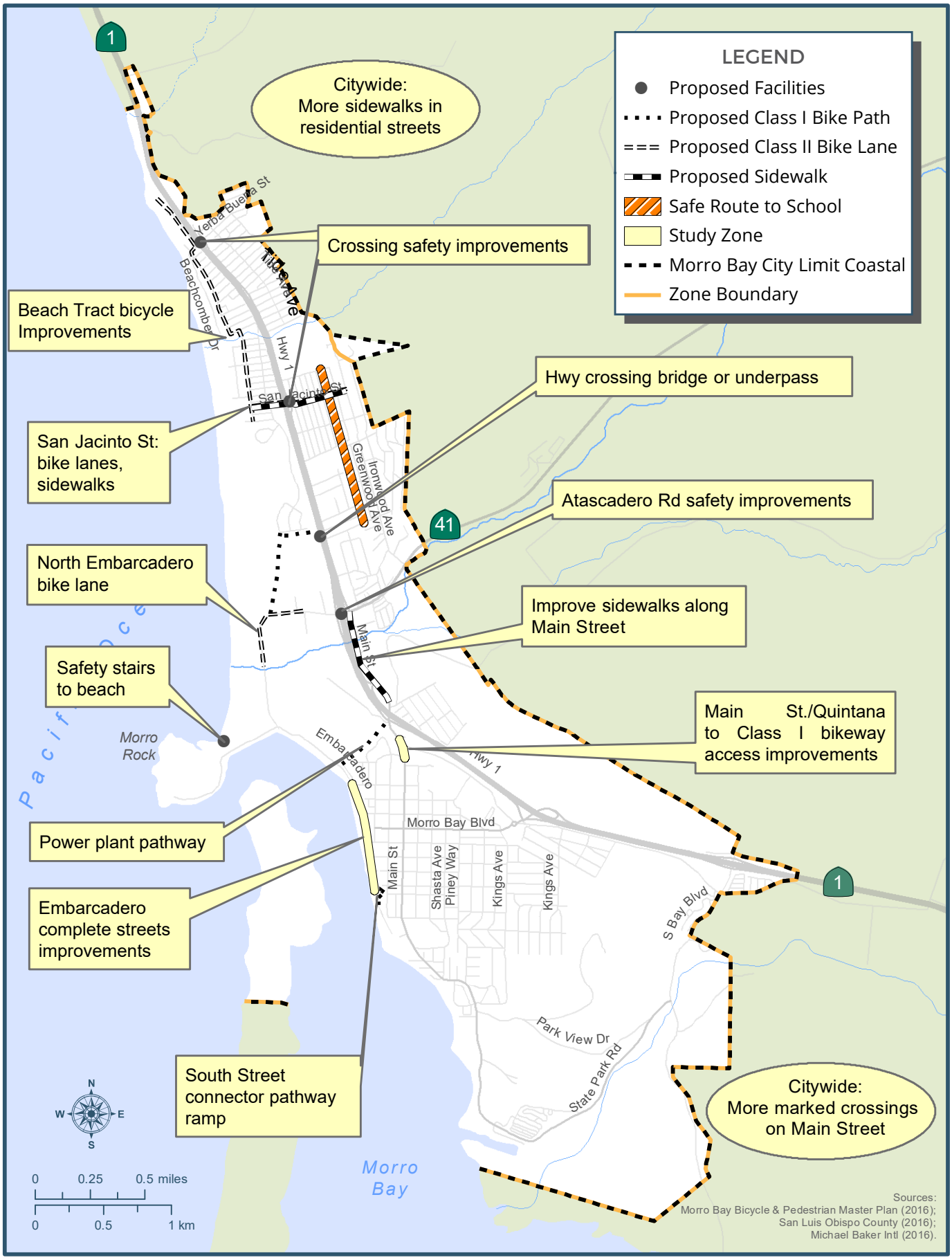

FIGURE 13.7

Planned Bicycle and Pedestrian Facilities

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TRANSIT

Morro Bay is served by regional and local transit services.

Regional Transit

The San Luis Obispo Regional Transit Authority (RTA) is a joint powers authority providing fixed-route regional service throughout the county and serving the Morro Bay Transit Center on Harbor Street. RTA provides ADA paratransit service through the Runabout, a demand response system operating within three-quarters of a mile of all fixed-route services in the county. Figure 13.8 shows the RTA routes.

RTA Route 12 runs from Morro Bay to San Luis Obispo with stops in Los Osos, Cuesta College, and Cal Poly. It runs on one-hour headways on weekdays and two-hour headways on weekends.

RTA Route 15 runs from Morro Bay to San Simeon with stops in Cayucos and Cambria. It operates on two- to three-hour headways on weekdays and Saturdays and four-hour headways on Sundays.

RTA ridership has consistently increased each year since 2007. Additionally, 2013 ridership is 270 percent greater than 2003 ridership.

Local Transit

The City operates Morro Bay Transit, which provides fixed-route service with hourly headways from 6:25 a.m. to 6:45 p.m. on weekdays and 8:25 a.m. to 4:25 p.m. on Saturdays. Curb-to-curb service is provided within three-quarters of a mile of the fixed route on a reservation basis. This route serves the city's major campgrounds, high school, senior center, grocery store, and neighborhoods throughout the city. Figure 13.9 shows the Morro Bay Transit routes.

The Morro Bay Trolley operates three loops from Memorial Day weekend through the first weekend in October. The routes serve north Morro Bay, Downtown, and the waterfront with headways under one hour. Stops are provided at the State Park

campground, Downtown, the Embarcadero, Morro Rock, and Morro Strand campground. Figure 13.10 shows the Morro Bay trolley routes.

Morro Bay Transit's 2013 triennial performance audit provided four recommendations:

1) Establish performance standards for all services to better track performance trends.

2) Construct a full ridership profile based on the North County Transit Surveys and additional customer feedback. This information should be used to tailor marketing and public outreach activities.

3) Consider implementing targeted public information campaigns about services to increase ridership among key populations.

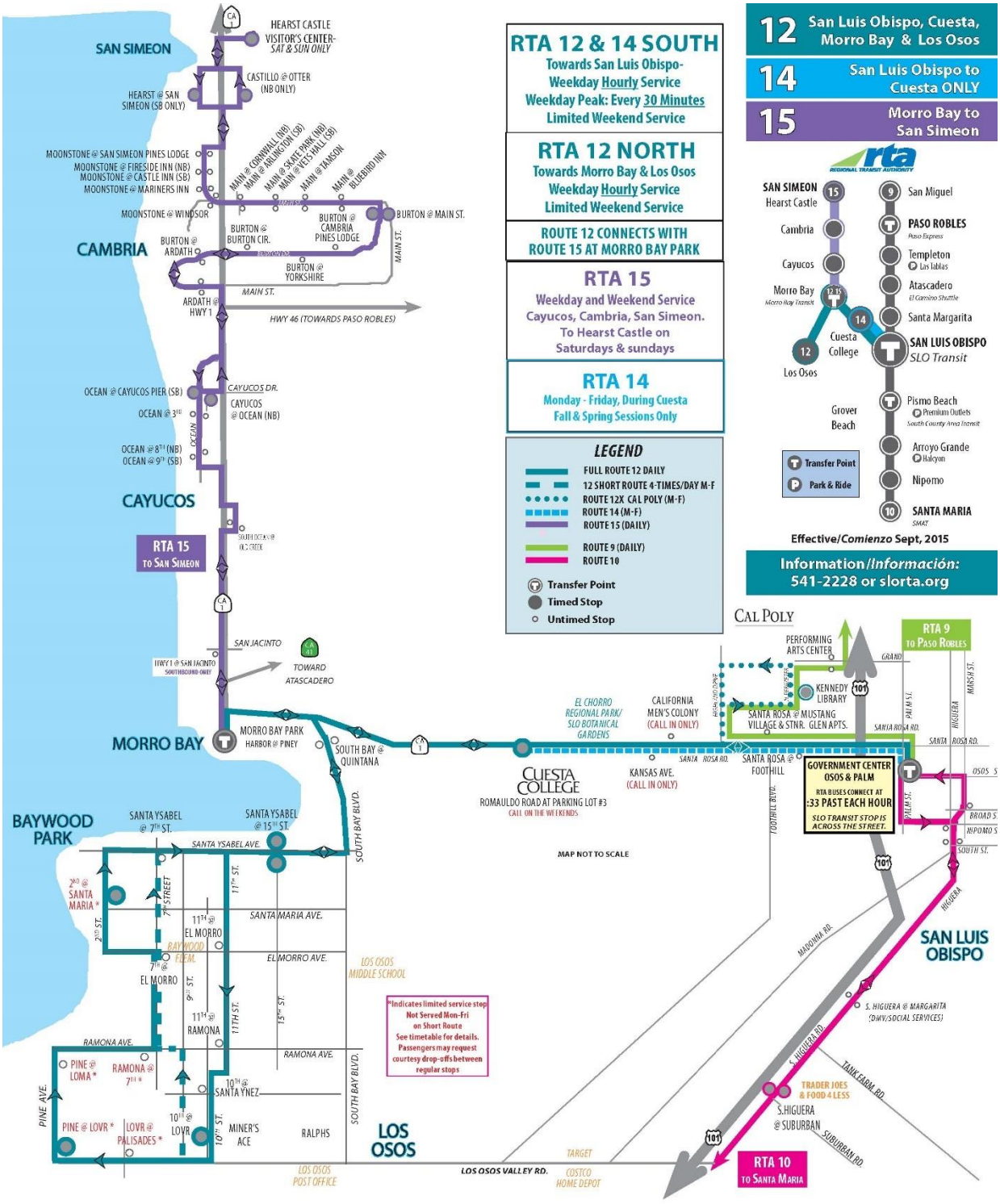
4) Make it easier for riders to submit feedback about transit services.

In response to the first recommendation, the City established performance standards regarding passengers per vehicle service hour and incentivized these goals in its service contract. To the second recommendation, the City solicited feedback through both print and electronic methods in addition to conducting on-board opinion surveys and boarding/alighting counts. The City acted on the third recommendation by publicizing unmet transit needs hearings, advertising in local newspapers, visiting senior centers, using targeted marketing to tourists, and identifying a small commuter market. The City implemented the fourth recommendation by offering several methods to receive customer feedback, including an online customer feedback link and a comment form printed in the Morro Bay Transit brochure.

Morro Bay Transit Fixed Route and Call-A-Ride service saw ridership increase by about 30 percent from fiscal years 2012 to 2015. However, over the same period, Morro Bay Trolley ridership decreased by about 15 percent.

The Morro Bay Senior Citizens, Inc. operates a senior transportation shuttle on Monday through Thursday from 9:00 a.m. to 4:00 p.m. It serves destinations throughout the county.

Figure 13.8
San Luis Obispo RTA Fixed-Route Service to Morro Bay

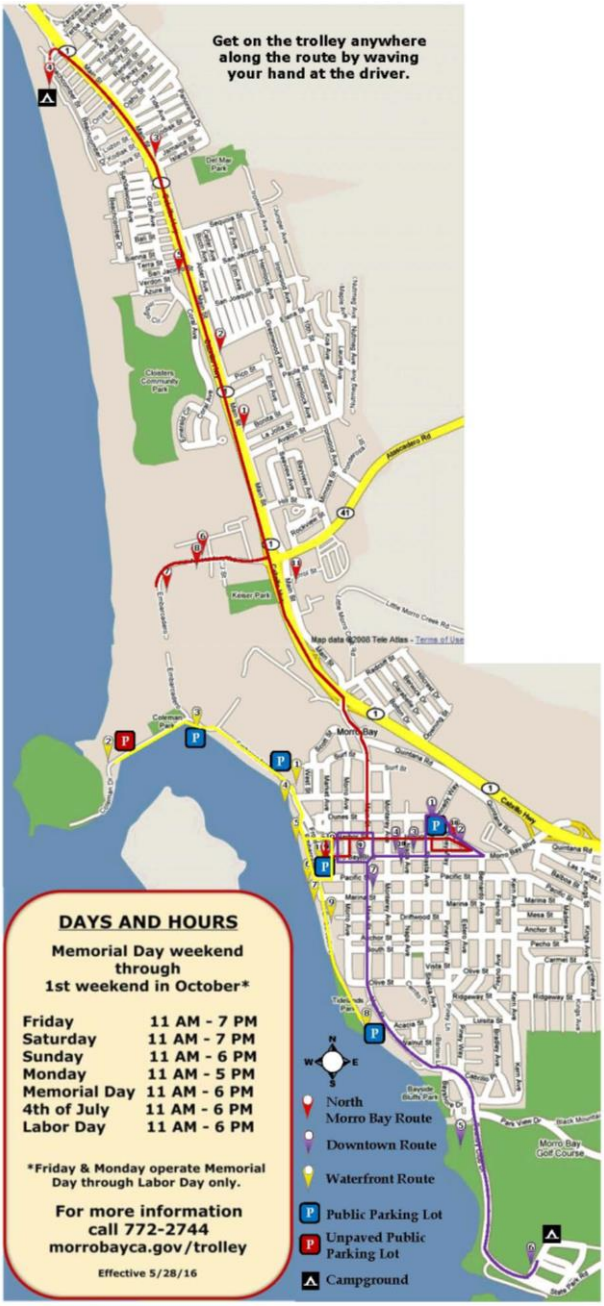


Source: San Luis Obispo RTA 2016

Figure 13.9
Morro Bay Fixed Route



Figure 13.10
Morro Bay Trolley Service



Source: City of Morro Bay 2016

13.2 REGULATORY SETTING

FEDERAL

There are no federal regulations directly applicable to transportation for the General Plan update.

STATE

California Department of Transportation

Caltrans is responsible for operating and maintaining the state highway system. In the planning area, Highway 1 and SR 41 fall under Caltrans jurisdiction. Caltrans provides administrative support for transportation programming decisions made by the California Transportation Commission for state funding programs. The State Transportation Improvement Program is a multi-year capital improvement program that sets priorities and funds transportation projects envisioned in long-range transportation plans.

Caltrans modifies the Federal *Manual on Uniform Traffic Control Devices* (MUTCD) (Federal Highway Administration 2009) to produce it for use in California. The California MUTCD (California State Transportation Agency 2014) defines standards for the installation and maintenance of traffic control devices on all public streets, highways, bikeways, and private roads open to public travel.

The Caltrans *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002) provides general guidance regarding the preparation of traffic impact studies for projects that may have an impact on the state highway system. The guidance includes when a traffic study should be prepared and the methodology to use when evaluating operating conditions on the state highway system.

The guidance states, "Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS." It also states that where "an existing

State highway facility is operating at less than the appropriate target LOS, the existing [measure of effectiveness (MOE)] should be maintained."

Complete Streets

Caltrans Deputy Directive DD-64-R1 – Complete Streets - Integrating the Transportation System provides for the needs of travelers of all ages and abilities in all programming, planning, design, construction, operations, and maintenance activities and products on the state highway system. Caltrans views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycles, pedestrians, and transit modes as integral elements of the transportation system.

Caltrans develops multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations.

The CA 2008 Complete Streets Act (Assembly Bill 1358) requires that cities and counties in California plan for the accommodation of all users, including pedestrians, bicyclists, transit riders, drivers, and persons with disabilities.

Government Code Section 65302 (b) requires that any substantive revision of the circulation element must "plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan."

Senate Bills 375 and 743

Senate Bill (SB) 375 (2008) requires that regional transportation plans include a sustainable communities strategy (SCS) to reduce greenhouse gas emissions from passenger vehicles and light trucks.

SB 743 (2013) directs the Governor's Office of Planning and Research to develop new guidelines for the evaluation of transportation impacts under the California Environmental Quality Act. The draft guidelines identify VMT as the primary metric used to identify transportation impacts instead of vehicular LOS. SB 743 also creates a new exemption for certain projects that are consistent with a specific plan, and eliminates the need to evaluate aesthetic and parking impacts of a project, in some circumstances. The intent of SB 743 is to more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions.

REGIONAL

The San Luis Council of Governments (SLOCOG) is an association of local governments in San Luis Obispo County and includes seven incorporated cities and the County of San Luis Obispo. SLOCOG is responsible for transportation planning and funding in the region and serves as a forum for study and resolution of regional issues.

SLOCOG prepared a *Regional Transportation Plan/Sustainable Communities Strategy* (SLOCOG 2014), laying out the blueprint for regional transportation system. The RTP identifies multimodal improvements to the transportation system over the next 20 years with a focus on maximizing transportation choices.

LOCAL

The City of Morro Bay has a number of local plans, policies, and regulations pertaining to the local circulation system in the planning area.

The City's 1987 *Engineering Standards and Specifications* provide design standards and details for city roadways, sidewalks, and street signs, among other public infrastructure standards.

The 1988 Morro Bay *General Plan* Circulation Element plans the circulation network for all modes of travel within the city.

The 1996 Morro Bay *Waterfront Master Plan* details proposals for four waterfront planning areas from Morro Rock to Tidelands Park and provides design guidelines

specifying height limits, site design and parking, and architectural characteristics. The plan also includes a section on transportation and harbor improvements including a recommended new vehicular connection across Morro Creek from the Embarcadero to Atascadero Road.

The 2007 Morro Bay *Parking Management Plan* documents existing parking supply and demand conditions and recommends measures to improve parking conditions in the city.

The 2011 Morro Bay *Bicycle & Pedestrian Master Plan* establishes goals and objectives related to walking and biking in the city. The plan identifies and ranks specific improvements to improve conditions for cyclists and pedestrians.

The 2013 City of Morro Bay *Climate Action Plan* sets benchmarks for Morro Bay's 2005 greenhouse gas emissions and identifies measures to reduce greenhouse gas emissions to a level 15 percent below 2005 levels by 2020, including measures related to transportation which constitutes 40 percent of the 2005 greenhouse gas emissions.

13.3 PRIORITY FINDINGS

EXCESSIVE MOTOR VEHICLE SPEEDS

Some collector streets in residential areas routinely experience speeds greater than five miles per hour above the speed limit. This results in part from the fact that many collector streets are not consistent with current Federal Highway Administration guidelines, and so posted sign limits are not always sufficient to allow for a safe, orderly flow of traffic.

AREAS IN NEED OF IMPROVEMENT

The intersection of Main Street/SR 41/Atascadero Road experiences high levels of delay and congestion during the weekday p.m. peak hour. The Greenwood Avenue corridor is an important route to the city's only elementary school and should be a priority for safe routes to school improvements. The intersections of Highway 1/San Jacinto Street and Main Street/San Jacinto Street are complicated for drivers, cyclists, and pedestrians to navigate. Sidewalks along the Embarcadero are often congested with pedestrians and

would benefit from widening. Many Downtown streets are wider than needed, resulting in long pedestrian crossing distances which increase pedestrian exposure to vehicles and make walking less comfortable. The connections between the Embarcadero and Downtown could be improved to encourage pedestrian activity between these two areas. Specific information about the current state of repair of Morro Bay's transportation network is not readily available at time of writing, but it is likely that there are areas where the condition of the pavement could be improved. Similarly, information is not available about the precise locations in Morro Bay that do not have sidewalks, but these locations are areas in need of improvement and should be identified so the lack of sidewalks can be corrected.

VMT AND LOS STANDARDS

The City does not currently have a policy in place for evaluating transportation conditions. Recent legislation favors VMT to measure CEQA transportation impacts instead of LOS.

ADEQUATE PARKING

Parking supply is generally adequate except for a short time during peak holiday weekends in localized areas.

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14. 0 WATER AND WATER QUALITY

Plan MORRO BAY

14.0 WATER AND WATER QUALITY

This chapter identifies existing water and water quality conditions in the planning area and summarizes applicable regulations for pollutant discharge from point sources and runoff, and water quality management programs.

For more information on water supply and municipal water service, see Chapter 6, Infrastructure and Public Services.

14.1 EXISTING CONDITIONS

HYDROLOGICAL SETTING

Local Hydrology

The majority of the City of Morro Bay is in the Morro Bay Watershed. Located primarily in the central area of coastal San Luis Obispo County, the Morro Bay Watershed covers 46,598 acres. A small portion of the city north of Morro Bay Boulevard is located within the Cayucos Creek - Whale Rock Watershed. Waters in the Cayucos Creek - Whale Rock Watershed drain into Morro Creek and discharge into the Pacific Ocean. The watershed boundaries and primary creeks providing drainage are detailed in Figure 14.1.

Morro Bay Watershed

The geology of the Morro Bay Watershed is highly varied, consisting of complex igneous, sedimentary, and metamorphic rock. Over 50 diverse soils, ranging from fine sands to heavy clays, have been mapped in the area. Soils in the upper watershed are predominantly coarse-textured, shallow, and weakly developed. Deeper medium- or fine-textured soils are typically found in valley bottoms or on gently rolling hills. Earthquake activity and intense rain events increase landslide potential and severity in sensitive areas (for more information, see Chapter 8, Natural and Environmental Hazards).

Much of the watershed remains as open space used primarily for agriculture and a range of public uses, including parks, golf courses, nature preserves, a military base, and university-owned rangeland. The developed portions of the watershed include the community of Los Osos/ Baywood Park, parts of the City of Morro Bay, Cuesta College, Camp San Luis Obispo, the California Men's Colony, and various facilities operated by the County of San Luis Obispo. Specifically, land use in the watershed consists of about 60 percent ranchland, 19 percent brushland, 7 percent urban areas, 7 percent agriculture, and 7 percent woodland.

The Morro Bay Watershed climate is Mediterranean, and the majority of precipitation occurs as rainfall in the winter. The area receives about 95 percent of its 18-inch average annual precipitation between the months of November and April. The mean air temperature ranges from around 45 degrees F in January to 65 degrees F in July, with prevailing winds from the northwest averaging about 15 to 20 miles per hour.

The Morro Bay Watershed was formed during the last 10,000 to 15,000 years. A post-glacial rise in sea level of several hundred feet resulted in a submergence of the confluence of Chorro and Los Osos Creeks. Today, waters in the Morro Bay Watershed drain into Chorro and Los Osos Creeks. A series of creeks that originate in the steeper hillslopes to the east of the bay drain westward into both creeks, which then drain into the bay.

Chorro Creek accounts for about 60 percent of the total land area, approximately 43 square miles, draining into the estuary. Major tributaries to Chorro Creek include San Bernardo, San Luisito, Walters, Pennington, and Dairy Creeks. Figure 14.2, from the Central Coast Wetlands GIS Project, shows the components of the Chorro Creek drainage system. Chorro Creek and its tributaries originate along the southern flank of Cuesta Ridge, at elevations of approximately 2,700 feet. Annual discharge of Chorro Creek and its tributaries is highly variable, ranging from approximately 2,000 to over 20,000 acre-feet, and averaging about 5,600 acre-feet. Flow in tributaries is intermittent in dry years and may disappear in all but the uppermost areas of the watershed.

In 2006, Chorro Creek, and its tributary Dairy Creek, were identified by the Central Coast Regional Water Quality Control Board (RWQCB) as having exceedances of biostimulatory substances and levels of dissolved oxygen. By 2010, the creek was delisted for dissolved oxygen impairment. The nutrients listing remains in effect; sampling shows nutrient concentrations are improving.

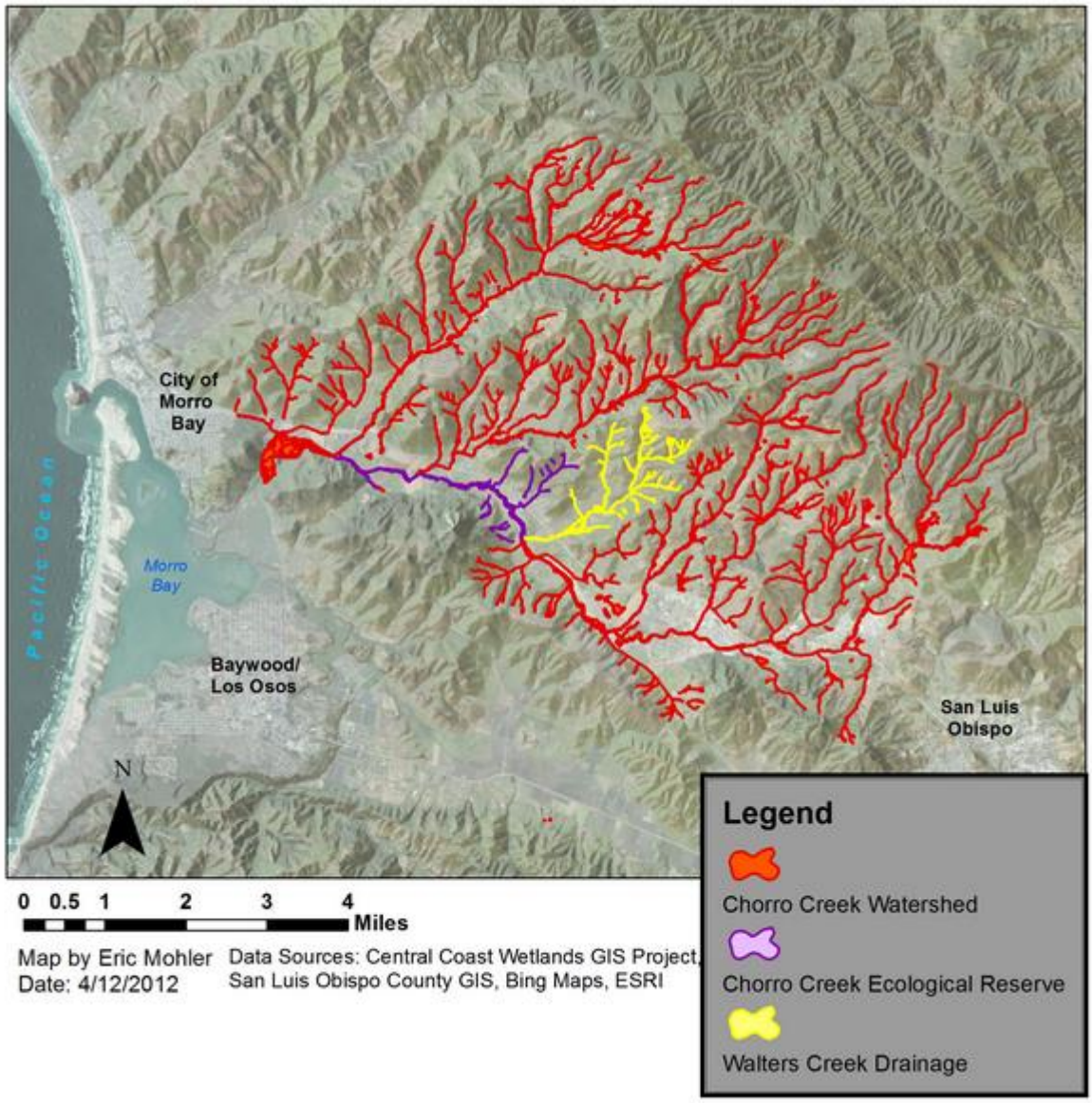


FIGURE 14.1

Watersheds

Page 2

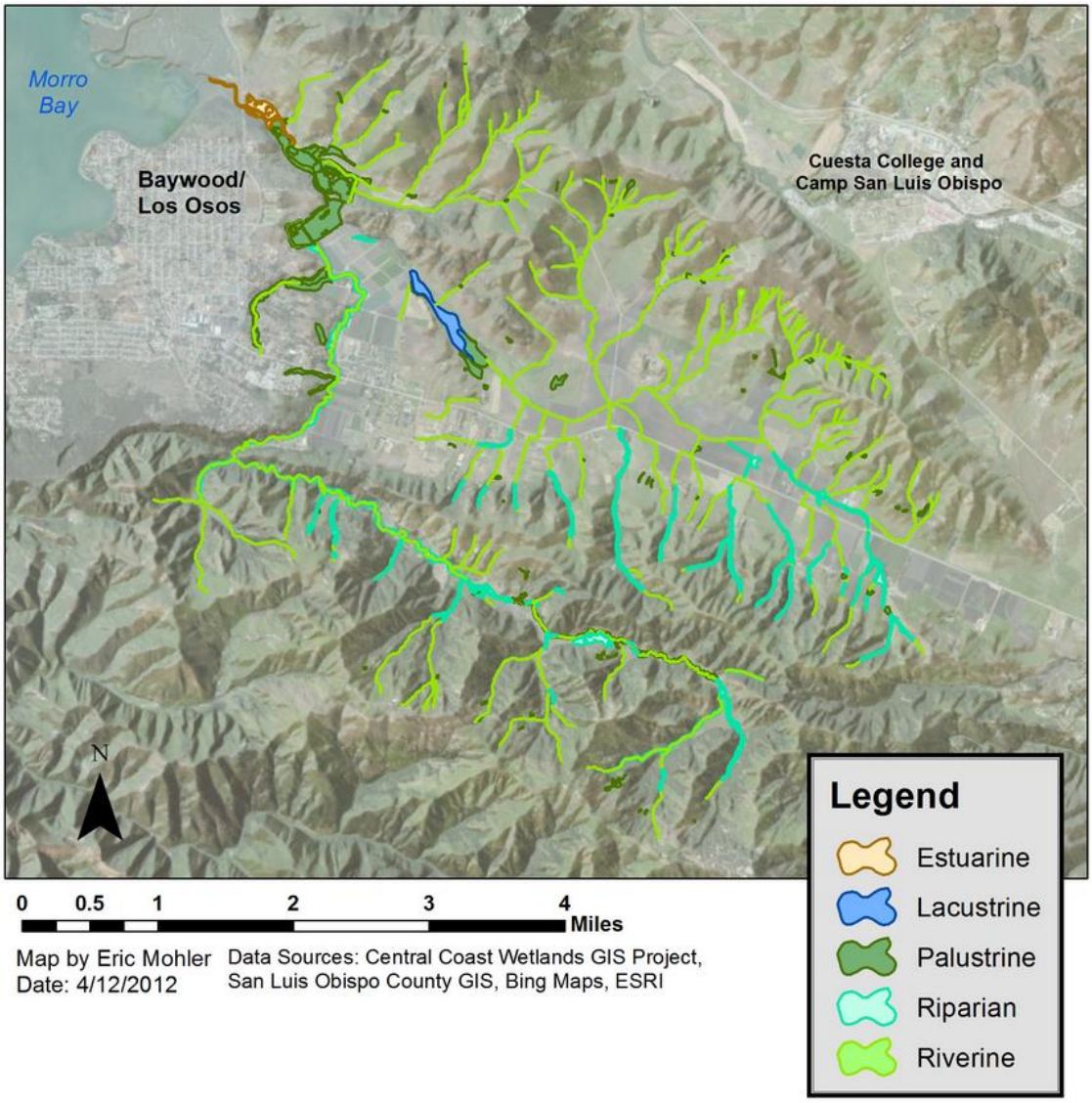
Figure 14.2 - Chorro Creek Drainage System



The Los Osos creek system is much smaller and does not run through the planning area. Los Osos Creek subwatersheds consist of steep pre-Quaternary noninfiltrative headwaters and a flat, highly infiltrative Quaternary valley. Los Osos Creek starts in Clark Valley and flows northwest toward Morro Bay. Warden Creek is a major tributary to Los Osos Creek. The creek system also includes Eto Lake and Warden Lake. Figure 14.3, from the Central Coast Wetlands GIS Project, shows the components of the Los Osos Creek drainage. Los Osos Creek regularly goes dry during the summer at its crossing with Los Osos Valley Road.

Los Osos Creek and its tributary, Warden Creek, were identified as impaired for nutrients in 1998, specifically nitrate-nitrogen (nitrate-N), due to discharges from agricultural cropland, and were added to the 303(d) list (a list of impaired waterways pursuant to the 1972 federal Clean Water Act [CWA]) in 2002. Nitrate-N levels exceed the objectives of the Water Quality Control Plan for the Central Coast Basin (Basin Plan) for the protection of the municipal water supply (MUN) beneficial use. To address the impairment, Region 3 (the Central Coast RWQCB) adopted the Los Osos Creek, Warden Creek, and Warden Lake Wetland Nutrient total maximum daily load (TMDL) in 2004. To protect the MUN beneficial use, the TMDL established a receiving water nitrate-N concentration numeric target that is equal to the existing Basin Plan water quality objective of 10 mg/L nitrate-N (Central Coast RWQCB 2004). The TMDL also established an implementation plan to achieve the numeric target. A water quality report released by the Central Coast RWQCB in 2014 shows that conditions in the creeks are improving and closer to achieving numeric targets but that continued implementation of the programs to address impairment must continue.

Figure 14.3 - Los Osos Creek Drainage System



Cayucos Creek - Whale Rock Watershed

A portion of the planning area north of Morro Bay Boulevard is located within the Cayucos Creek - Whale Rock Watershed. Waters in the Cayucos Creek - Whale Rock Watershed drain through four major drainages that independently reach the Pacific Ocean: Cayucos Creek, Old Creek, Toro Creek, and Morro Creek, the latter of which borders and shares some attributes with the Morro Bay Watershed. Morro Creek is the only one of these drainages geographically relevant to the planning area.

The headwaters of this watershed are in the Santa Lucia Range, reaching a maximum elevation of approximately 2,345 feet with the lowest elevation at around at sea level, draining into the Pacific Ocean. Whale Rock Reservoir is located in the watershed approximately one-half mile east of the community of Cayucos. The dominant land use in the watershed is agriculture, with the seaside town of Cayucos providing an urban core area with tourist-oriented opportunities.

Morro Creek

The Morro Creek subwatershed consists of steep pre-Quaternary noninfiltrative headwaters and a flat Franciscan low infiltrative valley. The watercourse flows from the Santa Lucia Mountains to discharge into the Pacific Ocean, at its mouth on Estero Bay, just north of Morro Rock. There has been historic mining of chromium as well as grazing by the cattle ranches within the catchment basin. There have been indications that the creek has experienced some environmental degradation from acid mine drainage to watersheds and sediment mobilization during storms. TMDLs have not been assessed by the Central Coast RWQCB.

Local Drainage

Urban runoff (stormwater) flows from inland locations through the planning area into the bay and the Pacific Ocean. Water flows through a network of storm sewer pipes and open channels as identified in Figure 14.4. The lines generally terminate through one of 65 outfalls and outlets at the western end of the city. Of these outfalls and outlets, 43 drain to the bay, 3 drain directly into the Pacific Ocean, and 19 drain to various creeks. A main storm drain, carrying water from Morro Creek, runs out to sea near Atascadero Road. Alva Creek waters reach the ocean through a storm drain terminating at the beach roughly between Jamaica Street and Island Street. To the south of Morro Rock, numerous smaller outlet pipes, inlets, and culverts drain into Morro Bay.

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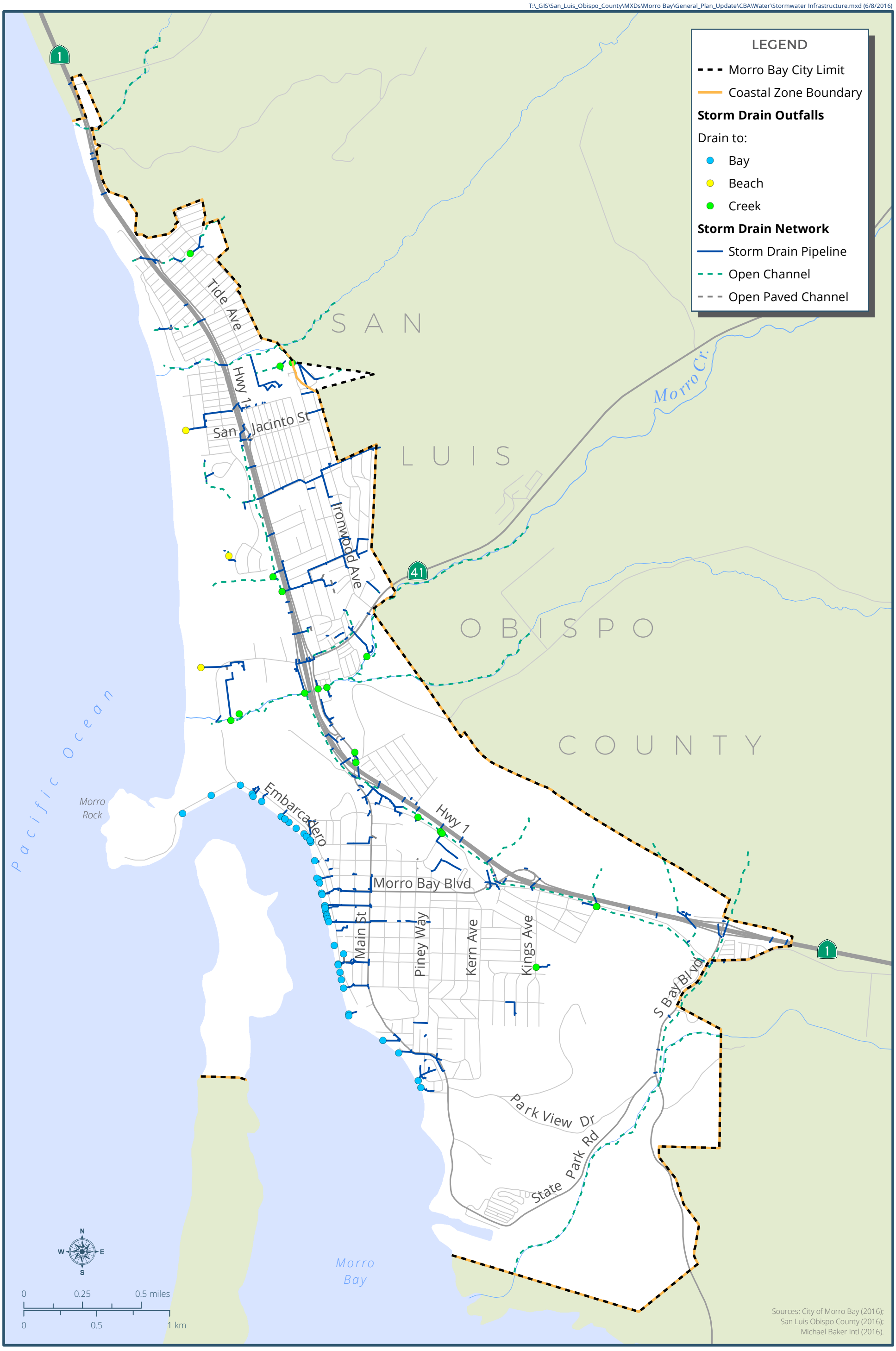

Plan MORRO BAY

FIGURE 14.4

Stormwater Infrastructure

Page 2

Groundwater Hydrology

Two distinct groundwater basins underlie the project area: Morro Valley and Chorro Valley. The Chorro Valley and Morro Valley Groundwater Basins are shallow alluvial basins that behave similarly to an underground stream. Rainfall in the watershed percolates into the ground and flows underground to the ocean. Use of groundwater resources is controlled by the State Water Resources Control Board (SWRCB). The Chorro Valley and Morro Valley Groundwater Basins are supplied entirely by riparian underflow, groundwater outflow that takes place in valley alluvium instead of at the surface. Therefore, the SWRCP enforces permit use by outflow discharge quantity rather than the more easily measurable gaging station method.

Morro Valley Groundwater Basin

The Morro Valley Groundwater Basin underlies Morro Valley in west central San Luis Obispo County. The basin is bounded on the west by the Pacific Ocean and on all other sides by contact with impermeable rocks of the Jurassic to Cretaceous age Franciscan Group. The valley is drained by Morro Creek to the Pacific Ocean. Precipitation ranges from 15 to 17 inches per year. Groundwater is found in alluvium, dune sand, and terrace deposits. Well logs indicate a thickness of sedimentary rocks of about 60 feet.

The total storage capacity has been estimated at 7,600 acre-feet and 33,900 acre-feet. Recharge to the basin is by percolation of stream flow, precipitation, and excess irrigation flow (DWR 2004a). During drought conditions, concurrent operation of Morro Bay's seawater and freshwater supply wells from the Morro Valley Groundwater Basin could subject freshwater wells to seawater intrusion. Seawater intrusion and nitrates are the predominant concerns for water quality in this basin (City of Morro Bay 2015).

Chorro Valley Groundwater Basin

The Chorro Valley Groundwater Basin underlies Chorro Valley in west central San Luis Obispo County. The basin is currently bounded on the west by the Pacific Ocean and on all other sides by impermeable Franciscan Group and Miocene intrusive rocks. Chorro Creek drains this valley into Morro Bay. Precipitation ranges from 15 to 19 inches.

Groundwater is found in Holocene and late Pleistocene age alluvium, which consists of sand, gravel, and clay. The alluvium reaches a thickness of 70 feet near the mouth of

Chorro Creek. The total storage capacity of the aquifer is estimated at 9,600 acre-feet. Recharge to the basin is by percolation of stream flow, precipitation, and excess irrigation flow (DWR 2004b). The Chorro Valley Basin, especially in the lower valley area, is constrained by seawater intrusion, especially during drought conditions (City of Morro Bay 2015).

WATER QUALITY

The City's potable water supply quality depends on the quality of imported water and local groundwater, as well as the proportion in which the two sources are blended. The quality of these two sources is described below.

Groundwater

The City's water supply is tested at multiple locations annually. The City publishes a water quality report which details the water quality sampling results for City wells and SWP water. While the range of contamination in raw well water may exceed drinking water standards, all of the water delivered to customers is blended or treated to reduce contaminant levels to acceptable levels to meet health and safety requirements. Maximum contaminant levels are the highest level of a contaminant allowed in drinking water. Table 14.1 lists the drinking water contaminants that were detected during the most recent sampling.

Table 14.1
Water Sampling Results for Morro Bay Sources (2014)

Substance (units)	State Water Project		Well Water		Maximum Contaminant Level	Violation of State Thresholds?
	Average Amount	Range	Average Amount	Range		
Primary Drinking Water Standard						
Aluminum (ppm)	0.069	ND - .11	0.0017	ND - .01	1	No
Barium (ppm)	ND	ND -. 11	0.106	.3 - .128	1	No
Fluoride (ppm)	ND	ND - .11	0.1	.1 - .2	2	No
Nickel (ppb)	ND	ND - .11	0.35	ND - 10	100	No
Nitrate (ppm)	0.38	0.38	48	3.7 - 165	45	No
Selenium (ppb)	ND	ND - .11	8	2 - 13	50	No
Secondary Drinking Water Standard						
Chloride (ppm)	120	78 - 170	90.9	41 - 162	500	No
Color (units)	ND	ND	ND	ND	15	No
Copper (ppm)	ND	ND	1.7	ND - 20	1	No
Iron (ppb)	ND	ND	11.7	ND - 80	300	No
Manganese (ppb)	ND	ND	NA	NA	50	No
Odor (units)	ND	ND - 1	ND	ND	3	No
Specific Conductance (umhos/cm)	769	606 - 969	1118.3	893 - 1490	1,600	No
Sulfate (ppm)	120	120	83.3	54 - 121	500	No
Total Dissolved Solids (TDS) (ppm)	428	340 - 572	653.3	460 - 910	1,000	No
Turbidity (NTU)	0.07	.04 -.11	0.2	ND - 1	5	No
Zinc (ppm)	ND	ND	0.0025	ND - .03	5	No

Source: City of Morro Bay 2014

ppm = parts per million; ppb = parts per billion; µS/cm = micro-Siemens per centimeter; ND = not detected

In general, imported surface water has a lower total dissolved solids (TDS) concentration than local groundwater. The local groundwater produced by the City's groundwater wells generally has a TDS concentration ranging from 460 parts per million (ppm) to 910 ppm, with an average of 653.3 ppm (City of Morro Bay 2014b). The City's surface water supply imported through the SWP generally has a TDS concentration range of 340 to 572 ppm, with an average of 428 ppm (City of Morro Bay 2014b). Blending surface water and groundwater can help ensure TDS levels stay below state thresholds.

Currently, the nitrate contamination issue in the groundwater basins affects supply reliability of Chorro Valley groundwater wells, with levels averaging 48 ppm. Nitrates in

drinking water at levels above 45 ppm is a health risk for infants less than six months of age and pregnant women. However, the City is not in violation, as blending reduces the concentrations below established thresholds. The City is working to renew this water supply source by providing nitrate treatment or blending by 2020. Once treatment technologies are in place, the City does not anticipate future water quality issues that may affect supply or reliability.

Surface Water

The City of Morro Bay purchases water from the Central Coast Water Authority (CCWA). The CCWA obtains its water supply from the coastal reach of the SWP California Aqueduct. The source water of the SWP originates in Northern California's mountains, rivers, and streams, and flows through the Sacramento-San Joaquin Delta before entering the SWP's 444-mile California Aqueduct. The Coastal Branch Reach II of the SWP consists of a 101-mile-long aqueduct from Kern County to Vandenberg Air Force Base in Santa Barbara County.

Water is pumped from the West Branch of the SWP through a series of four pumping stations and ultimately delivered to the Polonial Pass Filtration Plant where the water is treated using conventional surface water filtration techniques. The Polonial Pass Plant is located in the Cholame Hills at an elevation of approximately 1,400 feet. This elevation allows the plant to distribute water from the plant to San Luis Obispo County, which is approximately 100 miles away. Typically, there is no other treatment of the purchased surface water. The City provides additional chlorine treatment as needed to keep an active disinfection residual in the distribution system. The interconnection is located downstream of the Polonial Pass Plant along the Coastal Branch Reach II (City of Morro Bay 2010).

Under Section 303(d) of the 1972 federal CWA, the state must submit an updated list of impaired waterways, called the 303(d) list, to the US Environmental Protection Agency (EPA) every two years. Impairment is measured by TMDL, the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. In California, reporting is assigned to the regional water quality control boards. The Central Coast RWQCB is Morro Bay's regional water control board. CCWQCB's last report to the EPA on impaired waterways identified which waterways in the Central Coast exceeded

maximums and if implementation plans to reduce TMDL were proving effective or not. It also detailed which water quality standards were not yet met for each waterway.

A large number of the 20 tracked pollutants are present in some amount in waterways in the Central Coast region, including fecal coliform, pH, E. coli, low dissolved oxygen, nitrate, sodium, turbidity, chloride, sedimentation/siltation, and unknown toxicity (Central Coast RWQCB 2009). According to the 2010 Integrated Report on Water Quality, impaired water bodies (those with one or more of these pollutants listed in quantities above the allowed threshold) in or near Morro Bay included Morro Bay and Chorro Creek. Morro Creek was assessed for a number of pollutants, but none were ultimately placed on the list. Table 14.2 shows the pollutants related to each of these water bodies.

Table 14.2
Impaired Water Bodies in the Planning Area (2010)

Water Body Name	Water Body Type	Listing Category*	Pollutant
Chorro Creek	River & Stream	5	Escherichia coli (E. coli)
		5	Nutrients
		5	Sedimentation/Siltation
Morro Bay	Bay & Harbor	4A	Dissolved Oxygen
		5	Pathogens
		5	Sedimentation/Siltation

Source: Central Coast RWQCB 2010

** TMDL requirement status definitions for listed pollutants are: 5= TMDL still required, 4A= addressed by EPA approved TMDL*

Groundwater Management

The Morro Valley Groundwater Basin is susceptible to nitrate contamination, primarily from nitrate-based agricultural fertilizers. A 2007 study found that nitrate concentrations in groundwater beneath farming operations in the lower Morro Valley had risen from an average of 34 milligrams per liter (mg/l) in 1980 to an average of 160 mg/l in 2007 (Morro Valley Groundwater Monitoring Cooperative 2013). Due to these elevated nitrate concentrations, which have periodically exceeded state drinking water standards, the City has reduced groundwater pumping from most groundwater wells since the late 1990s.

The Morro Valley Groundwater Basin was entirely unavailable to the city in 2000 due to nearby methyl tertiary butyl ether (MTBE) contamination in the basin. The City began treatment for MTBE in 2002 and continued this treatment until MTBE contamination levels fell below the RWQCB's monitoring threshold in 2008. Since then, the MTBE levels continue to remain below the RWQCB's monitoring threshold. The City has made significant investments in providing treatment for the Morro Valley Groundwater Basin.

A drinking water source assessment completed in 2009 found that Morro Valley Groundwater Basin wells are considered most vulnerable to the following activities: gas stations, known contaminant plumes, and agricultural drainage. The Chorro Valley Groundwater Basin wells are considered most vulnerable to the following activities not associated with any detected contaminants: agricultural drainage, septic systems, wells (agricultural, irrigation), and other animal operations (City of Morro Bay 2014a).

Stormwater Runoff

Stormwater runoff can be a significant contributor to both surface water and groundwater contamination. Runoff from agricultural fields often contains fertilizers that contain nitrates. In large quantities, nitrates have a negative impact on water ecosystems and human health. In 2007, the City conducted an analysis to determine the source of nitrate contamination throughout the basin, since concentrations in groundwater have been intermittently above allowable levels. The 2007 Morro Valley Nitrate Analysis identified nitrate-based agricultural fertilizers as the primary source of nitrate contamination in the Morro Valley Groundwater Basin.

Stormwater runoff in the city is regulated primarily through a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit program defines stormwater discharges as point sources because stormwater discharges from the end of a stormwater conveyance system (a single point). A point source is defined by the EPA as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." Point sources are regulated differently than dispersed pollutant sources; point source dischargers are required to obtain an NPDES permit in order to legally discharge pollutants into a water body. Consequently, the City of Morro Bay must obtain an NPDES permit for stormwater draining from the city.

The City is currently in compliance with the standards set forth in the MS4 permit (for small Municipal Separate Storm Sewer Systems). The City's Stormwater Management Program (SWMP) was developed to comply with its NPDES permit approved by the Central Coast RWQCB in 2009; an updated version was completed in 2010. For each year of the general permit, the City must comply with a detailed list of requirements to improve stormwater quality in the region. The requirements fall into 10 categories:

- Program management
- Education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site storm water runoff control program
- Pollution prevention / good housekeeping for city operations
- Post-construction stormwater management program
- Water quality monitoring
- Program effectiveness assessment
- Total maximum daily loads compliance

Annual Reporting

City staff reviews development applications to ensure they provide designs which are environmentally conscious, enhance water quality, and preserve and protect coastal waters and resources. All development and redevelopment projects which create or replace more than 2,500 square feet of impervious area must incorporate stormwater management controls.

To promote low impact development, the City has developed the *EZ Manual* (2014a), a guidance manual that supplements the Department of Public Services' overall standard Drawings and Specifications (1987). The manual lists necessary tasks, compliance years, and notes on implementation.

Morro Bay Estuary Water Quality

The Morro Bay Estuary is a 2,300-acre semi-enclosed body of water where freshwater flowing from the land mixes with the saltwater of the sea. The estuary environment encompasses the lower reaches of Chorro and Los Osos Creeks, a wide range of wetlands, salt and freshwater marshes, intertidal mud flats, eelgrass beds, and other subtidal habitats. Morro Bay is an important estuary to the city and larger region for its economic and ecological resources. The estuary is home to an important habitat for birds, fish, and other animals. It is a vital stop for migrating birds on the Pacific Flyway. Sheltering pools and eelgrass beds provide nursery habitat for fish and invertebrates.

The Morro Bay National Estuary Program (NEP) is one of 28 estuaries nationwide designated and funded by the EPA as National Estuary Projects due to its national significance. The Morro Bay NEP, detailed in the *Morro Bay National Estuary Program Comprehensive Conservation and Management Plan* (2012), protects and restores the important estuarine and watershed resources through on-the-ground projects, partnerships, and education. The Morro Bay NEP and its partners monitor water and sediment quality, habitat, and species. Monitoring is used to identify and track the most critical environmental issues, and to determine the effectiveness of restoration and pollution control actions.

Although the condition of the Morro Bay Watershed is relatively good when compared to other West Coast estuaries, and the resources present are relatively intact, the watershed is at great risk of degradation. Potential ongoing issues of concern include:

- Increased sedimentation in the bay and at the base of Chorro and Los Osos Creeks
- Elevated amounts of bacteria and pathogens
- Elevated amounts of nutrients
- Reduced amounts of dissolved oxygen

Impaired waterways flowing into the Morro Bay estuary, including Chorro Creek, Los Osos Creek, Dairy Creek, and Warden Creek, have effects on all these areas of concern. These waterways are impacted by agricultural runoff as well as a variety of human

activities. Urban runoff and loss of natural floodplains also have impacts on the health of the bay.

The NEP *Comprehensive Conservation and Management Plan* also found that climate change may result in additional TMDLs in impaired waterways and additional impaired waterways. Elevated nutrients, already an issue in Chorro and Los Osos Creeks, could continue to be increased by additional storms. Similarly, reduced amounts of dissolved oxygen result from high numbers of certain bacteria. Increasingly warm seasons from the warming climate may further elevate the presence of these bacteria and pathogens.

14.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Clean Water Act

Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave the EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for all contaminants in surface waters. The act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also created grant programs to assist states and local governments with the construction of sewage treatment plants and the implementation of watershed management programs. The act has been regularly amended (with substantial amendments in 1981 and 1987) since its enactment and includes multiple programs to protect water quality.

National Pollutant Discharge Elimination System Program

CWA Section 402 establishes the NPDES permit program, which sets nationwide permitting requirements for discharging pollutants into waterways. The limits vary by category of industry and are based on a level of treatment that is achievable using the best available technology. CWA Section 402 prohibits the discharge of pollutants into waters of the United States from any point source without an NPDES permit. To regulate stormwater (non-point source) discharges, the EPA developed a two-phased NPDES permit program, commonly referred to as Phase I and Phase II. The Phase I program for Municipal Sanitary Storm Sewer Systems (MS4s) requires operators of "medium" and "large" MS4s, that is, those that generally serve populations of 100,000 or greater, to implement a stormwater management program as a means to control polluted discharges from these MS4s.

Stormwater discharges from MS4s in urbanized areas are a concern because of the high concentration of pollutants found in these discharges. The NPDES Phase II permit program also requires the development and implementation of stormwater management plans to reduce such discharges. The Phase II program is based on the use of federally enforceable NPDES permits. The Phase II program encourages the use of general permits; provides flexibility for regulated operators to determine the most appropriate stormwater controls; allows for the recognition and inclusion of existing NPDES and non-NPDES stormwater programs in Phase II permits; includes public education and participation efforts as primary elements of the small MS4 program; attempts to facilitate and promote watershed planning and to implement the stormwater program on a watershed basis; and works toward a unified and comprehensive NPDES stormwater program with Phase I of the program.

Section 303(d) Impaired Waters List

CWA Section 303(d) requires states to develop lists of water bodies that would not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries). Section 303(d) requires that the state develop a TMDL for each of the listed pollutants. As noted previously, the TMDL is the amount of loading that the water body can receive and still be in compliance with water

quality objectives. The TMDL can also act as a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. The state-prepared TMDL must include an allocation of allowable loadings to point and nonpoint sources, with consideration of background loadings (sources of naturally occurring pollutants) and a margin of safety. The TMDL must also include an analysis that shows links between loading reductions and attainment of water quality objectives. The EPA must either approve a TMDL prepared by the state or, if it denies the state's TMDL, issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of a TMDL, it is intended that the problems that led to placement of a given pollutant on the Section 303(d) list would be remediated.

Water Quality Criteria and Standards

The EPA is the federal agency with primary authority for implementing regulations adopted under the CWA. The EPA has delegated to the state of California the authority to implement and oversee most of the programs authorized or adopted for CWA compliance through the state's Porter-Cologne Act, described below.

Under federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations. Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of the designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires the EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use.

Safe Drinking Water Act

Under the Safe Drinking Water Act (Public Law 93-523) passed in 1974, the EPA regulates contaminants of concern to domestic water supply. The act defines contaminants of concern as contaminants that pose a public health threat or alter the aesthetic acceptability (e.g., taste and odor, staining of laundry and porcelain fixtures) of the water. The EPA's primary and secondary maximum contaminant levels (MCLs), which apply to

treated water supplies delivered to the distribution system, regulate contaminants of concern. MCLs and the process for setting these standards are reviewed every three years. Amendments to the Safe Drinking Water Act enacted in 1986 and 1996 established an accelerated schedule for setting MCLs for drinking water.

The EPA has delegated the responsibility for administering California's drinking-water program to the California Department of Public Health. The Department of Public Health is accountable to the EPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by the EPA. The applicable state primary and secondary MCLs are set forth in Title 22, Division 4, Chapter 15, Article 4 of the California Code of Regulations (CCR), and described in Title 22 Standards, below.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California National Pollutant Discharge Elimination System Permit Programs

In many states, the EPA has delegated administration of the NPDES permit program to the state water quality control authority. In California, the State Water Resources Control Board (SWRCB) and its regional boards (RWQCBs) administer the NPDES permit program. Currently, discharges from construction, industrial, and municipal activities are regulated under the NPDES program, all of which are described below.

National Pollutant Discharge Elimination System Municipal Permits

The regional boards implement the municipal stormwater NPDES permit program. The state issues area-wide permits for urban areas that are considerable sources of pollutants or contribute to water quality standard violations. Regardless of population, the area-wide permits cover all municipalities within the defined urban area. The main goal of the general permit is to protect water quality from the impacts of stormwater runoff from small MS4s. The intent is that stormwater quality impacts will be considered in all aspects of a municipality's activities and that multiple departments within the

municipality will work together to implement stormwater best management practices (BMPs). Many activities that a municipality already does can be recognized as a benefit to stormwater or can be modified to add stormwater quality benefits. The general permit states that the permittee shall maintain, implement, and enforce an effective SWMP, and develop adequate legal authority to implement and enforce the SWMP.

On February 15, 2008, the Central Coast RWQCB sent a letter notifying the City of Morro Bay of the new enrollment process for the NPDES permit. This letter sets forth the RWQCB's expectations for the SWMP in order to be found in compliance with the general permit. The letter stated that the SWMP must include additional control measures, including six minimum control measures: maximize infiltration of clean stormwater, and minimize runoff volume and rate; protect riparian areas, wetlands, and their buffer zones; minimize pollutant loading; and provide long-term watershed protection. In order to achieve the maximum extent practicable standard, the City has incorporated each of these conditions into the six minimum control measures.

State Water Resources Control Board (SWRCP)

The California SWRCB is one of six branches of the California Environmental Protection Agency. The SWRCB oversees the allocation of the state's water resources to various entities and for diverse uses, from agricultural irrigation to hydroelectric power generation to municipal water supplies, and for safeguarding the cleanliness and purity of Californians' water.

Under the federal CWA and the state's Porter-Cologne Water Quality Control Act, the SWRCB has regulatory authority for protecting the water quality of nearly 1,600,000 acres (6,500 km^2) of lakes, 1,300,000 acres (5,300 km^2) of bays and estuaries, 211,000 miles (340,000 km) of rivers and streams, and about 1,100 miles (1,800 km) of California coastline. The SWRCB also provides financial assistance to local governments and nonprofit agencies to help build or rejuvenate wastewater treatment plants, and protect, restore, and monitor water quality, wetlands, and estuaries.

California Coastal Act of 1976

The California Coastal Act of 1976 (Coastal Act) and the California Coastal Commission, the state's coastal protection and planning agency, were established by voter initiative

in 1972 to plan for and regulate new development, and to protect public access to and along the shoreline. The Coastal Act considers water quality and water-related public safety concerns as issues of public importance.

To provide maximum public access to the coast and public recreation areas, the Coastal Act directs each local government located within the coastal zone to prepare a Local Coastal Program consistent with Section 30501 of the Coastal Act, in consultation with the Coastal Commission and with public participation.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, the SWRCB is provided with the ultimate authority over state water rights and the water quality policy. However, Porter-Cologne also established nine regional boards, or RWQCBs, to provide oversight on water quality issues at a regional and local level. Morro Bay lies within the jurisdiction of the Central Coast RWQCB (Region 3). The SWRCB has overall responsibility for water quality regulation under division 7 of the Porter-Cologne Water Quality Control Act. This act also divides the state into nine hydrological basins for local administration of the act by the semiautonomous RWQCBs with coordination and oversight from the SWRCB. The RWQCBs have authority to regulate point source discharges, such as municipal stormwater discharges, through the adoption of waste discharge requirements under chapter 5.5 of the act. In addition, the responsibility for implementing the NPDES permit program has been delegated to the SWRCB and its local RWQCBs.

Title 22 Standards

California's drinking water quality standards are contained in Title 22 of the CCR. Water quality standards are enforceable limits composed of two parts: the designated beneficial uses of water and criteria (i.e., numeric or narrative limits) to protect those beneficial uses. Municipal and domestic supply is among the "beneficial uses" defined in Section 13050(f) of the Porter-Cologne Act as uses of surface water and groundwater that must be protected against water quality degradation. MCLs are components of the drinking water standards adopted by the California Department of Health Services (now the Department of Public Health) pursuant to the California Safe Drinking Water Act (Title 22 CCR, Division 4, Chapter 15, Domestic Water Quality and Monitoring). Primary water quality objectives were established for protection of health. Secondary water quality

objectives were established for aesthetic concerns (e.g., taste and odor, staining of laundry and porcelain fixtures), and at elevated levels do not pose a health hazard.

Drinking water MCLs directly apply to water supply systems "at the tap" (i.e., at the point of use by consumers in, for example, their home and office), and are enforceable by the state and San Luis Obispo County. California MCLs, both primary and secondary, directly apply to groundwater and surface water resources when they are specifically referenced as water quality objectives in the pertinent basin plan. In such cases, MCLs become enforceable limits by the SWRCB and RWQCBs.

Central Coast Regional Water Quality Control Board

The Central Coast RWQCB is one of nine regional boards which serve as the frontline for state and federal water pollution control efforts. Central Coast RWQCB is Region 3, and extends roughly from Santa Cruz to Santa Barbara and from the coast inland with a boundary approximately locational with I-5. The Central Coast RWQCB's basin plan encompasses hydrologic areas, monitoring water quality and issuing waste discharge requirements and enforcement action against violators.

California Nondegradation Policy

In 1968, the SWRCB adopted a nondegradation policy aimed at maintaining high quality for waters in California. The nondegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

- Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.

- Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements, which would ensure: (1) pollution or

nuisance would not occur, and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Toxics Rule and State Implementation Plan

On May 18, 2000, the EPA promulgated numeric water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to waters in California. The EPA promulgated this rule based on the administrator's determination that numeric criteria are necessary in California to protect human health and the environment. These federal criteria are legally applicable in California for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

The policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries became effective in 2006 and is commonly referred to as the State Implementation Plan. The plan applies to discharges of toxic pollutants into inland surface waters, enclosed bays, and estuaries of California subject to regulation under the Porter-Cologne Water Quality Control Act and the CWA. Such regulation may occur through the issuance of NPDES permits or other relevant regulatory approaches. The State Implementation Plan establishes a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.

NPDES Permit System and Waste Discharger Requirements for Construction

The Central Coast RWQCB has adopted specific NPDES permits for activities that have potential to discharge wastes to waters of the state. The Central Coast RWQCB has issued a general NPDES permit and general Waste Discharge Requirements (WDR) covering discharges from construction, industrial, and municipal activities. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. The NPDES permits all involve similar processes including submittal of notices of intent to discharge to the Central Coast RWQCB and implementation of BMPs to minimize those discharges.

Construction activities subject to the general construction activity permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or

reduce non-stormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to install post-construction permanent BMPs that would remain in service to protect water quality throughout the life of the project, consistent with the planning and land development requirements of the MS4 permit. Types of BMPs include source controls, treatment controls, and site planning measures.

Activities subject to the NPDES general permit for construction activity must develop and implement a stormwater pollution prevention plan. The plan includes a site map and description of construction activities and identifies the BMPs that will be employed to prevent soil erosion and discharge of other construction-related pollutants, such as petroleum products, solvents, paints, and cement, that could contaminate nearby water resources. A monitoring program is generally required to ensure that BMPs are implemented according to the stormwater pollution prevention plan and are effective at controlling discharges of pollutants related to stormwater.

Municipal Stormwater Permit Program

The SWRCB Municipal Storm Water Permitting Program regulates stormwater discharges from MS4s. MS4 permits are issued in two phases. Under Phase I, which started in 1990, the RWQCBs adopted NPDES stormwater permits for large and medium municipalities (large MS4 systems serve populations of 250,000 or more people). Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. Morro Bay is under a Phase II Small MS4 General Permit, which became effective on July 1, 2013 (Order No. 2013-0001 DW). Phase II permits provide permit coverage for smaller municipalities (population less than 100,000). The current MS4 permit requires the discharger to develop and implement a stormwater management plan/program with the goal of reducing the discharge of pollutants in stormwater to the maximum extent practicable, which is the performance standard specified in CWA Section 402(p). The management programs specify which BMPs will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. For each year of the general permit, the City must comply with a detailed list of requirements aimed at improving stormwater quality in the region. The requirements fall into 10 categories:

1) Program management

2) Education and outreach

3) Public participation and involvement

4) Illicit discharge detection and elimination

5) Construction site storm water runoff control program

6) Pollution prevention / good housekeeping for city operations

7) Post-construction stormwater management program

8) Water quality monitoring

9) Program effectiveness assessment

10) Total maximum daily loads compliance

To assist in implementing the general permit, the City of Morro Bay has compiled a guidance document listing necessary tasks, compliance years, and notes on implementation. In addition to the new permit requirements, the City must also continue to fulfill the requirements outlined in the City's SWMP, which was developed under the previous general permit.

Recycled Wastewater Requirements

Wastewater recycling in California is regulated under Title 22, Division 4, of the CCRs under the jurisdiction of the Department of Public Health. The intent of these regulations is to ensure protection of public health associated with the use of recycled water. The regulations establish acceptable levels of constituents in recycled water for a range of uses and prescribe means for ensuring reliability in the production of recycled water. Using recycled water for nonpotable uses is common throughout the state and is an effective means of maximizing use of water resources. The Central Coast RWQCB establishes water reclamation requirements under the Title 22 regulations and is responsible for implementing wastewater recycling projects.

California Department of Water Resources

The DWR is responsible for preparation of the California Water Plan, regulation of dams, provision of flood protection, and other functions related to surface water and groundwater resources.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND LAWS

Urban Water Management Plan

The City's UWMP (2010) serves as a foundational document and source of information for Water Supply Assessments (SB 610) and Written Verifications of Water Supply (SB 221). The UWMP ensures the City as a water provider has adequate water supplies available or planned infrastructure improvements to meet future demand in the face of diminishing water resources. The City is currently completing an update to the UWMP reflecting 2015 conditions.

Morro Bay Municipal Code

The Morro Bay Municipal Code has several sections relating to water quality. Chapter 13.12 governs the connection, permitting, and design of new sewers as well as quality of sewer and stormwater discharge; grease, oil, and sand interceptors for construction; and both commercial and residential facility operations. It also identifies sewer charges and discharge fees.

Chapter 14.48 covers building regulations, including illicit discharge and stormwater management control. It identifies the responsibilities of the discharger, illegal discharges, exceptions, and requirements to eliminate illegal discharges and remediate discharges.

Morro Bay Stormwater Management Plan

The Morro Bay SWMP identifies key BMPs of the NPDES permit (NPDES General Permit Order No. 2003-0005-DWQ). It outlines implementation tasks and additional continuing tasks for the 10 categories as outlined under Municipal Stormwater Permit Program, above.

Morro Bay Stormwater Management Guidance Manual for Low Impact Development and Post-Construction Requirements (and EZ Manual)

The City of Morro Bay is required by the Central Coast RWQCB to implement hydromodification criteria and low impact development (LID). As a site is developed, the site becomes less permeable and therefore less water can infiltrate back into the ground. LID techniques attempt to mimic the natural site hydrology before development in order to protect water quality and control runoff flows in new and significant redevelopment projects.

The City participated in a joint effort with other municipalities and agencies on the Central Coast to develop hydromodification criteria for long-term watershed protection. The results of that joint effort included the preparation of the *Stormwater Management Guidance Manual for Low Impact Development & Post-Construction Requirements* (known as the *EZ Manual*). Two versions of the EZ Manual are available. The condensed manual identifies LID practices for individual single-family homes. The main EZ Manual is used for all other projects.

Morro Bay Sewer System Management Plan

The Sewer System Management Plan (SSMP) was adopted in 2009 and last updated in 2014. The plan achieves compliance with the state's WDR, which requires any public agency that owns or operates a sanitary sewer system more than 1 mile in length that conveys untreated or partially treated wastewater to a publicly owned treatment works in the state of California to comply with the requirements of the WDR. Per the requirements of the WDR, the City performed two audits of the SSMP (June 2011, June

2013), which focused on the plan's effectiveness and the City's compliance with the SSMP requirements identified in the WDR.

Morro Bay National Estuary Program Comprehensive Conservation and Management Plan

The Comprehensive Conservation and Management Plan (CCMP) defines the priority issues facing the health of the Morro Bay Estuary and Watershed and presents action plans to effectively address those issues. The CCMP is the guiding document for the NEP. The NEP has four watershed goals:

- Water quality protection and enhancement
- Ecosystem restoration and conservation
- Public education, outreach, and stewardship
- Fostering collaboration

These issues were identified through grassroots public participation, scientific study, and more than a decade of conservation and restoration experience. The priority issues include: accelerated sedimentation, bacterial contamination, elevated nutrient levels, toxic pollutants, scarce freshwater resources, preserving biodiversity, and environmentally balanced uses. The NEP has a five-year implementation period.

The CCMP includes 61 action plans that the NEP and its partners used to address the threats to the estuary. All of the action plans have been initiated. Some have been fully completed, and a few were found to be ineffective and have been discontinued. Since the first CCMP in 2001, new issues, notably the effects of climate change, have been incorporated into action plans.

14.3 PRIORITY FINDINGS

This section identifies priority findings related to water and water quality in Morro Bay. Related priority findings regarding improvements for water and wastewater infrastructure are provided in Chapter 6, Infrastructure and Public Services.

STORMWATER NITROGEN RUNOFF

The presence of nitrogen in both groundwater and surface streams and bay waters remains a significant issue for the city and the larger region. Nutrients—primarily nitrogen and phosphorus—are essential for the growth of all living organisms in the natural water system. However, excessive nitrogen and phosphorus degrade water quality and can present hazards for drinking water in higher concentrations. Although nitrogen levels in groundwater and SWP water have been below quality thresholds for the entire system in recent years, individual streams and wells continue to have unacceptably high levels.

Fertilizers from agricultural practices remain the largest contributor to nutrients such as nitrogen and phosphorus. The runoff from these lands lead to eutrophication, a decrease in oxygen levels. This can result in excessive growth of algae and aquatic vegetation (such as algae blooms), which often results in deteriorated water quality and beach closings.

The City has implemented a range of urban runoff regulations and discharge rules to address this problem. However, additional efforts are necessary to maintain and improve water quality.

SEAWATER INTRUSION OF GROUNDWATER WELLS

In the past, the Morro Valley Groundwater Basin has experienced intermittent periods of seawater intrusion during long-term droughts that result in overdraft of the shallow groundwater resources. As a result, Morro Bay has imposed intermittent building permit rationing and de facto moratoriums on new water and sewer hook-ups. The problem of overdrafting has been partially solved by the purchase of increased rights to SWP water during drought events. However, with continued growth and mounting pressure on SWP

resources statewide, plans for additional water sources may be necessary to prevent seawater intrusion into the groundwater system.

CLIMATE CHANGE IMPACTS ON THE MORRO BAY ESTUARY

Climate change is expected to have a variety of effects on the Morro Bay Estuary ecosystem and associated water quality conditions. Two possible effects include: increasing intensity and frequency of severe storm events influencing the transport of sediment; and increasingly warm seasons further elevating the presence of bacteria and pathogens. Knowledge about how climate change effects impact the watershed and estuary has greatly improved over the last decade, but additional information is needed to identify BMPs and restoration projects to be implemented in the future. Initial efforts to address this issue have been undertaken in the last decade and are included in the updated NEP.

WATER SYSTEM PLANNING

The City's water and water quality issues are currently addressed by complicated and overlapping plans (i.e., the Urban Water Management Plan, the Morro Bay Stormwater Management Plan, and the Morro Bay Sewer System Management Plan). As discussed in Chapter 6, these plans are being concurrently updated and will be included in a single planning document titled the One Water Plan. The One Water Plan represents an integrated approach to water supply, wastewater treatment, and stormwater management planning. This collaborative approach will be a more accessible, sustainable, and resilient way to manage the City's future water needs and sustain a long-term water supply.

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APPENDICES

Plan MORRO BAY

Appendix A: Coastal Hazard Modeling and Mapping

Appendix A. Coastal Hazard Modeling and Mapping

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1. BACKGROUND

This appendix presents technical information on the numerical modeling approach used to estimate and map future sea level rise hazard zones. These hazard zones were used as the basis of the vulnerability assessment.

2. INTRODUCTION

Morro Bay's exposure to coastal hazards due to sea level rise was estimated using modeling tools and coastal datasets. The coastal hazards that were modeled as part of the Community Baseline Assessment include inundation, flooding (both coastal and fluvial) and dune/bluff erosion. Flooding and inundation terms are used explicitly in this report. Flooding is used to describe episodic events that result in relatively short-duration periods of standing water. Wave run-up limits are used as a proxy for flooded areas since these areas would only become exposed during extreme wave conditions (i.e., 50- or 100-year events). Inundation represents a condition of nearly continuous periods of standing water. The mean high water (MHW) shoreline position was used as a proxy for the inundation limit for this study.

The modeling variables, approaches, and equations used to define the study's coastal hazards are shown in Table 1. Figure 1 illustrates the response of dune-backed beach to an extreme wave event and resultant inundation, flood and dune hazard zones.

TABLE 1: MODELING APPROACHES

Hazard	Metric	Input Variables	Modeling Approach	Modeling Equations
Inundation	Mean High Water	Slope, Depth of Closure, Sea Level Rise	Empirical	Modified Bruun Rule (Rosati, Dean, Walton 2013)
Dune Erosion	Dune Toe	2% Run-up Elevation, Dune Toe, Beach Slope	Empirical +Monte Carlo	Stockdon, 2006 - Komar, 1999
Coastal Flooding	2% Run-up Elevation	Surge, Sea Level Anomalies, Tide, Significant Wave Height, Peak Wave Period, Beach Slope	Empirical +Monte Carlo	Stockdon, 2006
Fluvial Flooding	100-year Flood Limit	100-year River Discharge	Empirical	1-D HEC-RAS Steady State
Bluff Erosion	Top of Bluff	Historic Erosion Rate, Sea Level Rise	Empirical	Revell et al. 2011

The general modeling approach was to collect and analyze available coastal topographic / bathymetric data, model existing and future hazards, and then map the hazards. Experiment-based (empirical) equations and a data simulation model were used to quantify the future hazards. The data simulation was conducted using a Monte Carlo method, which is a probabilistic computational tool where the governing equations are well known, but the independent variables of the input (demand) and the resulting design components (capacity) may not be completely known. The Monte Carlo approach uses a distribution of each variable, then uses that random variable within the described parameters to generate a single computation. The process repeats hundreds or thousands of times to generate a statistical output of design parameters, which accounts for the uncertainty of the input parameters. For instance, tides, waves and beach characteristics all influence coastal flooding and have their own statistics and likelihoods. These variables were randomly combined thousands of times in order to simulate the statistics and likelihood of a given coastal hazard.

Details on model inputs, such as local water levels, waves and sea level rise scenarios, as well as how the respective coastal hazards were mapped are described in this section.

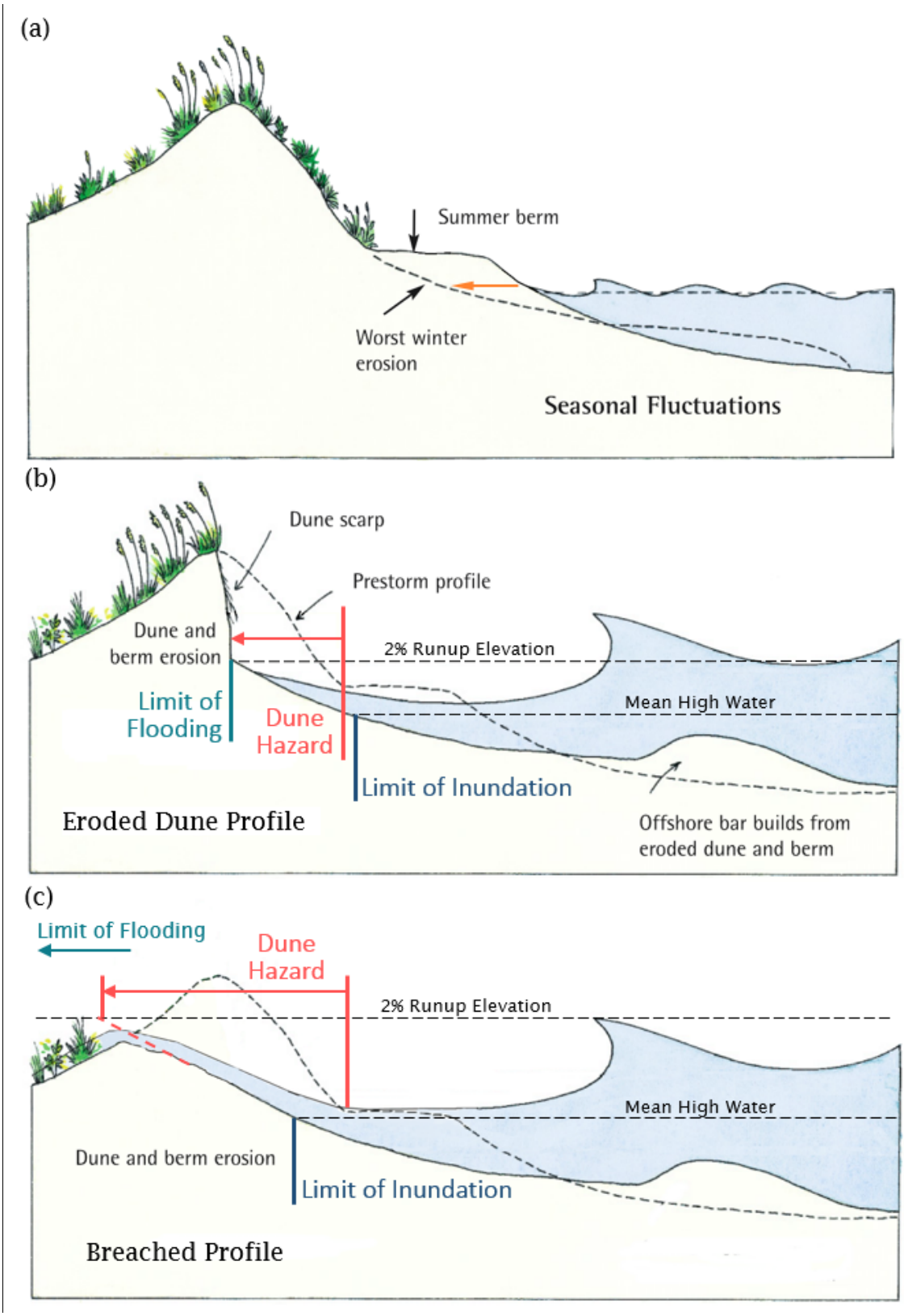


FIGURE 1: DETERMINATION OF COASTAL FLOODING AND INUNDATION ZONES
(Modified Illustrations. Originals by D Williams, in Rogers & Nash 2003)

3. COASTAL SITE CONDITIONS

3.1. WATER LEVELS

3.1.1. Historical Statistics

The nearest, long-term sea level record in proximity to the study area is the Port San Luis tide gage (Station 9412110) operated by the National Oceanic and Atmospheric Administration (NOAA). The gage is located on the Harford Pier, which has been collecting data since 1948. These data are applicable to the open-ocean coastline in Central California and are summarized in Table 2.

TABLE 2: WATER LEVELS IN PORT SAN LUIS (1983-2001 TIDAL EPOCH)

Description	Datum	Elevation (feet MLLW)
Highest Observed Water Level (1/18/1973)	Maximum	7.65
Highest Astronomical Tide	HAT	7.10
Mean Higher-High Water	MHHW	5.32
Mean High Water	MHW	4.62
Mean Sea Level	MSL	2.80
Mean Low Water	MLW	1.04
Mean Lower-Low Water	MLLW	0.00
North American Vertical Datum of 1988	NAVD88	0.08
Lowest Astronomical Tide	LAT	-1.99
Lowest Observed Water Level (01/07/1951)	Minimum	-2.40

(Source: NOAA 2016)

Tidal data obtained from the Port San Luis tide gage was used to estimate probability distributions for tidal levels, surge, and sea-level anomalies (e.g., higher water levels due to warm water temperatures or low atmospheric pressure). The parameterized water levels used in the Monte Carlo analysis are described below:

- Tides – Tides in Morro Bay are semi-diurnal, which refers to two highs and two lows occurring per day. A mean of 0 ft (MSL) with a standard deviation of 1.6 ft was used. These probabilistic parameters were calculated by analyzing the astronomical tide record. Astronomical tides result solely from gravitational effects of the moon and sun, without any atmospheric influences.

- Sea-Level Anomaly (SLA) – Anomalous water levels as a result of unusual water temperatures (El Niño), salinities, average monthly winds, atmospheric pressures, and/or coastal currents. These effect occur on a time scale of weeks and months. A mean SLA of 0 ft (MSL) with a standard deviation of 0.2 ft was used. These parameters were calculated using 14-day moving average of tidal residual. The tidal residual is the difference between the recorded tide and the predicted astronomical tide.

- Storm Surge – Storm surge is the abnormal rise of sea levels in response to wind associated with a short-term event. Return period storm surge values of 2.4 ft (10 yr), 2.9 ft (25 yr), 3.2 ft (50y r) and 3.5 t (100 yr) were used in the analysis. These return periods were calculated by running an extreme value analysis on tidal residual. Storm surge events were limited to tidal residuals spikes less than a day in length.

3.1.2. Sea Level Rise Scenarios

The California Coastal Commission Sea Level Rise Policy Guidance (CCC 2015) document considers "Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past Present, and Future" (NRC 2012) the best available science on relative sea level rise for the state of California. Therefore, the Coastal

Commission recommends that the sea level rise projections in this study be used for coastal planning and sea level rise policy. Sea level rise projections for the various planning horizons being considered (i.e., 2030, 2050, and 2100) were derived from this study. The NRC 2012 study's high range sea level rise projections for the area south of Cape Mendocino were used as the basis of the vulnerability assessment (Table 3). The high range projections for sea level rise coincide with an upper estimate of a "business as usual" greenhouse gas emissions scenario. This climate scenario assumes that emissions continue to increase until the end of the 21st Century without a significant decrease in fossil fuel use (Snover et al. 2013).

TABLE 3: SEA LEVEL RISE PROJECTIONS FOR THE STUDY AREA

Year	Projected Sea Level Rise (ft)	Projection Uncertainty (ft, +/-)	Low Range (ft)	High Range (ft)
2030	0.5	0.2	0.2	1.0
2050	0.9	0.3	0.4	2.0
2100	3.1	0.8	1.5	5.5

(Source: National Research Council 2012)

3.2. WAVES

Waves act to carry sand in both the cross-shore and longshore directions and can also cause short-duration flooding events by causing dynamic increases in water levels. Thus, the wave climate (or long-term exposure of a coastline to incoming waves) and extreme wave events are important in understanding future sea level rise vulnerabilities.

Offshore wave data was analyzed by combining NOAA measurements and a USGS wave forecast data set. Data for both sources were obtained 60 miles west-northwest of Morro Bay at NOAA buoy 46028 (Figure 2).

The USGS wave forecast information was derived using four separate global circulation models (GCM) to force a numerical wave model (WaveWatch III) to create future wave information (Erikson et al. 2015). The four GCMs were forced using a future climate scenario called RCP 8.5, as defined by the fifth phase of the Coupled Model Inter-comparison Project (CMIP5). CMIP5 RCP 8.5 corresponds to the upper end of climate emission scenarios; thus, correlates with the high projected rates of sea level rise used throughout the analysis. The four forecasted wave data records and the historic NOAA buoy wave data were combined to create four, 117-year datasets.

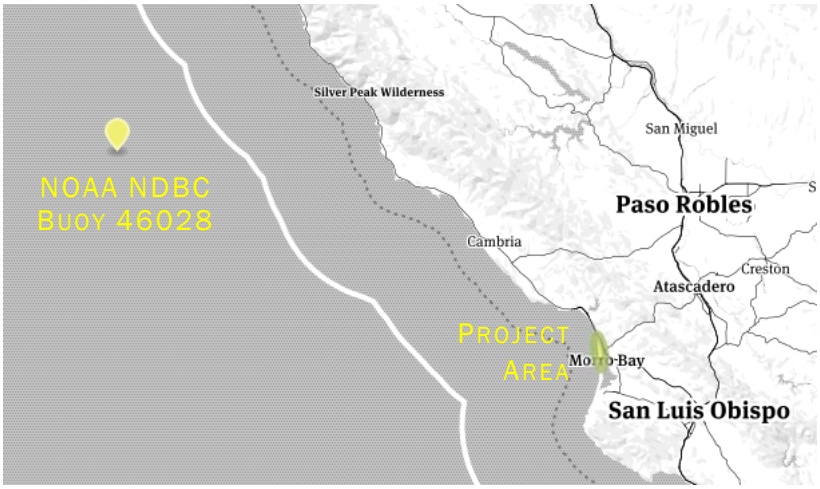


FIGURE 2: LOCATION OF NOAA NDBC BUOY 46028

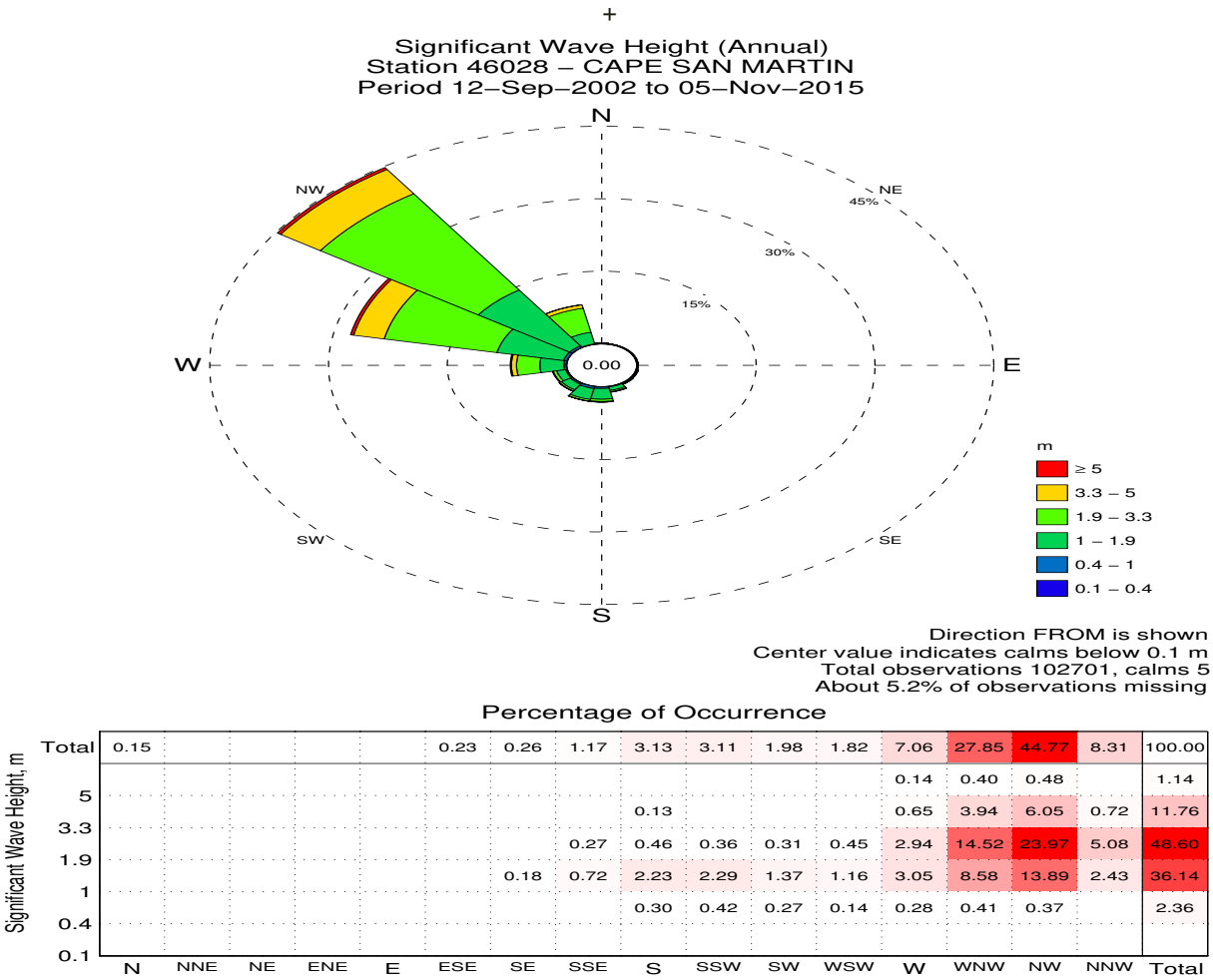
3.2.1. Wave Climate

The largest percentage (>45%) of the waves approaching Morro Bay are from the west-northwest (293 degrees). Historically, the most frequent significant wave height is 8.2 to 9.8 feet (2.5 to 3 meters) and the most frequent wave periods were between 12 to 13 seconds and 14 to 15 seconds (Figure 3 and Figure 4). The largest waves occur in the winter when northern hemisphere cyclonic storms generate powerful, long period waves.

For the sheltered beach within the Morro Bay jetties, the wave heights were reduced 75%. This wave reduction value was calculated by estimating breaking wave characteristics from aerials and bathymetry. The wave heights within the jetties were typically 75% less than those outside the jetties.

3.2.2. Extreme Waves

An extreme value analysis was used for each of the four 117-year hybrid datasets and averaged to produce extreme wave return periods. The results of the analysis on the four hybrid datasets is shown in Figure 5. The 50- and 100-year return period significant wave heights are 28.8 and 30.0 feet, respectively. A relationship between wave height and period was fitted to the historic buoy data and used to estimate peak wave periods corresponding with extreme waves (Erikson et al. 2015). The peak period for 50- and 100-year waves is approximately 18 seconds.



Percentage of Occurrence

Significant Wave Height, m	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total	0.15					0.23	0.26	1.17	3.13	3.11	1.98	1.82	7.06	27.85	44.77	8.31	100.00
5													0.14	0.40	0.48		1.14
3.3									0.13				0.65	3.94	6.05	0.72	11.76
1.9								0.27	0.46	0.36	0.31	0.45	2.94	14.52	23.97	5.08	48.60
1							0.18	0.72	2.23	2.29	1.37	1.16	3.05	8.58	13.89	2.43	36.14
0.4									0.30	0.42	0.27	0.14	0.28	0.41	0.37		2.36
0.1																	
Total	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total

FIGURE 3: HISTORIC ANNUAL SIGNIFICANT WAVE HEIGHT AND DIRECTION (NOAA NDBC BUOY 46028)

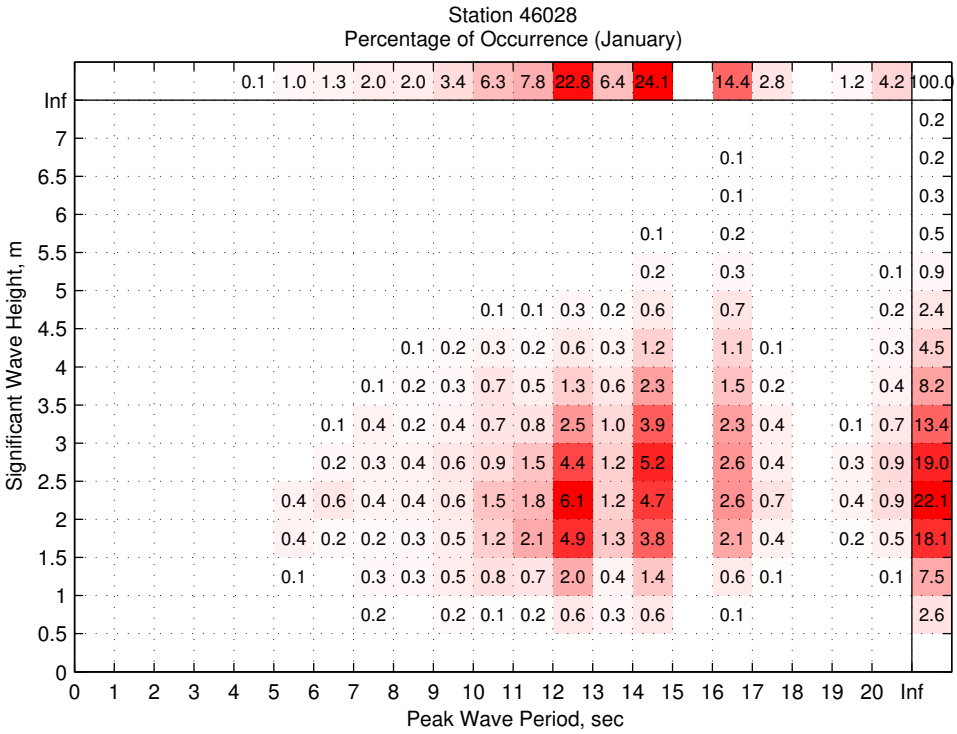


FIGURE 4: HISTORIC SIGNIFICANT WAVE HEIGHT AND PEAK WAVE PERIOD JOINT HISTOGRAM

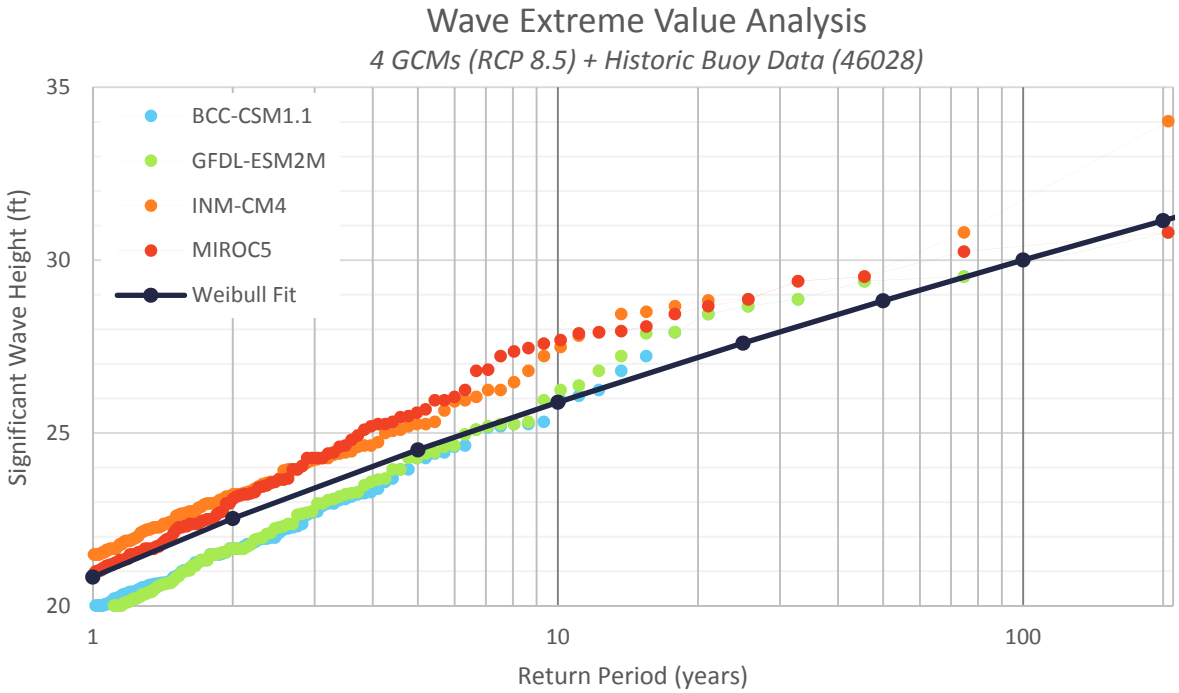


FIGURE 5: EXTREME WAVE RETURN PERIODS (WEIBULL FIT LINE USED FOR ANALSIS)

3.3. COASTAL TOPOGRAPHY / BATHYMETRY

The beach characteristics of the Morro Bay coastline were parameterized using five, bare-earth, light detection and ranging (LiDAR) data collected between 1997 and 2013. The flight date, source and coverage of the individual flights is shown in Table 4.

TABLE 4: LIDAR DATASETS

Survey Name	Flight Date	Source	Coverage
1997 Pre-El Nino	October 1997	NOAA/USGS/NASA	Entire Study Area
1998 Post-El Nino	April 1998	NOAA/USGS/NASA	Entire Study Area
2010 USACE NCMP Lidar	August 2010	JALBTCX, USACE	Entire Study Area
2011 PG&E: Los Osos, CA	March 2011	PG&E	Only south of Morro Rock
2013 PG&E: San Simeon, CA	February 2013	PG&E	Only north of Morro Rock
2013 California Topobathy Merge	February 2014	Hybrid Sources (published by NOAA)	Entire Study Area

Topographic data was used to create representative beach profiles for eight reaches within the City, as shown in Figure 6. The reaches were delineated based on similar characteristics such as foreshore slope and dune toe. An example of beach profile change between the topographic data sources used for this study is shown in Figure 7.

The XX DEM was used for mapping inundation hazards within the bay. The

The XX



FIGURE 6: STUDY SHORELINE REACHS (BOUNDED BY ORANGE LINES)

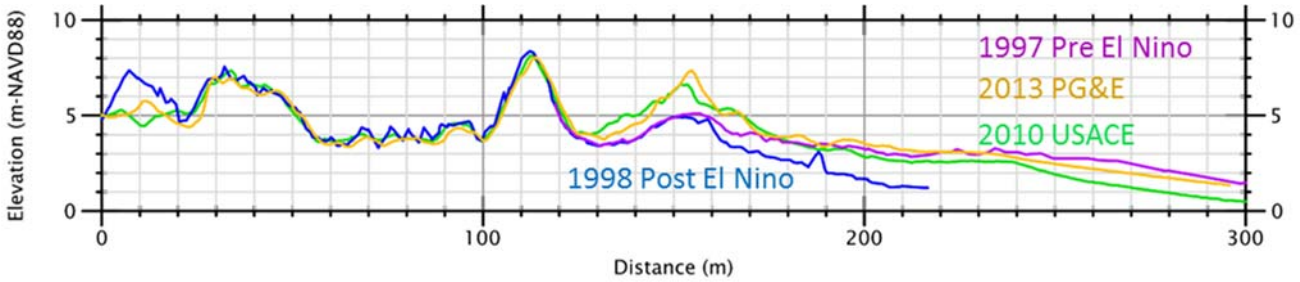


FIGURE 7: BEACH TRANSECT WITHIN MORRO BAY HIGH SCHOOL REACH

3.4. COASTAL STRUCTURES

Coastal structures in the City includes three coastal protection structures (i.e., seawalls and revetment), a harbor entrance channel jetty system and numerous shoreline protection structures (i.e., bulkhead walls and rip rap) along the bay waterfront. The location of these structures is shown in Figure 8. The modeling assumed that coastal structures were not present as a worst-case scenario. A "hold the line" scenario would result in modeled hazards stopping at these structures. It is anticipated that these coastal structures would be overwhelmed at some point in the future. The potential overwhelming of these structures are discussed qualitatively elsewhere.

Bay waterfront structures crest elevations (as determined by the topobathy merge LiDAR dataset) were analyzed relative to projected water levels to determine if overtopping would occur. No structural evaluation of the structures was conducted relative to these projected water levels.



FIGURE 8: SHORE PROTECTION IN MORRO BAY

4. COASTAL SEA LEVEL RISE HAZARD ANALYSIS

4.1. INUNDATION HAZARD ZONES

Methods used to determine coastal and bay inundation zones are described in this section.

4.1.1. Coastal Inundation Hazard Zone

A widely accepted method for quantifying shoreline response associated with sea level rise is referred to as the modified Bruun Rule (Rosati, Dean, Walton 2013). The method, or rule, assumes that as mean sea level rises, the beach profile and the foredune is able to adjust upwards and landward as sediment is conserved across the profile (Figure 9).

The modified Bruun Rule does not explicitly account for local sediment sources or sinks. Some approaches for quantifying future erosion incorporate short-term shoreline change rates. However, due to the sparsity of data and the influence of harbor dredging and nourishment practices on those surveys, the short-term shoreline change rates could not reliably be calculated.

The current and projected future coastal inundation hazard zone was mapped using the mean high water (MHW) line as a proxy. Using the offshore slope of approximately 20:1 (horizontal to vertical) for Morro Bay, the beach face and foredune shifts up and back 20 ft for every foot of sea level rise. Inundation due to seasonal erosion is accounted for through use of a winter profile beach slope.

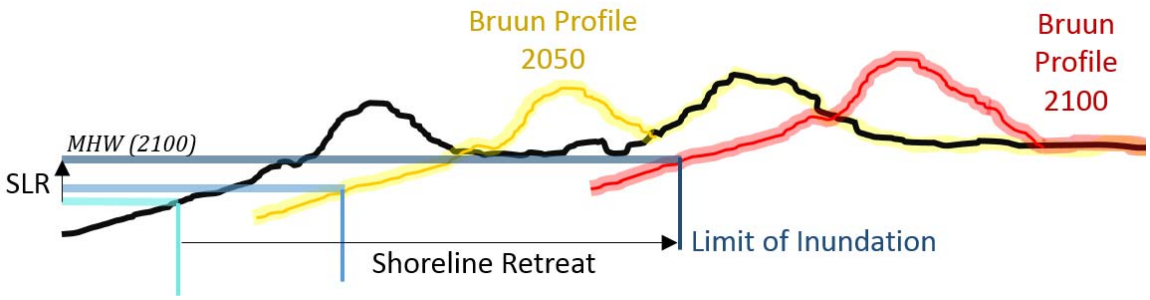


FIGURE 9: BEACH PROFILE AND INUNDATION HAZARD ZONE ADJUSTMENT ACCORDING TO THE BRUUN RULE

4.1.2. Bay Inundation Hazard Zone

Mapping of the inundation hazard zone within the bay was determined using a "bathtub" model approach. The bathtub approach compares the elevation of future tidal water levels to existing grades. For this analysis, the 2009-2011 TopoBathy merge LiDAR dataset was compared to a tidal elevation of mean higher high water (MHHW) in combination with sea level rise. The combined water levels within the bay for the inundation hazard zone were as follows:

- Year 2030 – 6.25 ft NAVD88
- Year 2050 – 7.25 ft NAVD88
- Year 2100 – 10.75 ft NAVD88

Note that the accuracy of these hazard zones are contingent on the quality of the topographic data in these areas.

4.2. DUNE EROSION HAZARD ZONE

The dune erosion hazard zone was mapped using simple geometric model referred to as the Komar method (Komar 1999). This model is a commonly used tool for estimating dune erosion on the swell-dominated U.S. West Coast and is recommend by FEMA (Heberger et al. 2009, Revell et al 2011, FEMA 2015). The method assumes that the dune toe elevation erodes following the upper beach slope until it reaches the wave run-up elevation (Figure 10). The method requires the use of a "most likely winter profile". In general, a winter profile is one in which the flat sandy berm (towel space) has migrated offshore to form sand bars. Winter profiles for this study were constructed using the dune features of the PG&E LiDAR datasets and upper-beach slopes measured from the post-El Niño LiDAR surveys. For the dune-backed beaches in Morro Bay, the dune toe is typically found at elevations of 11 to 12 ft NAVD88 with a typical winter beach slope of 3.5% to 4.5%.

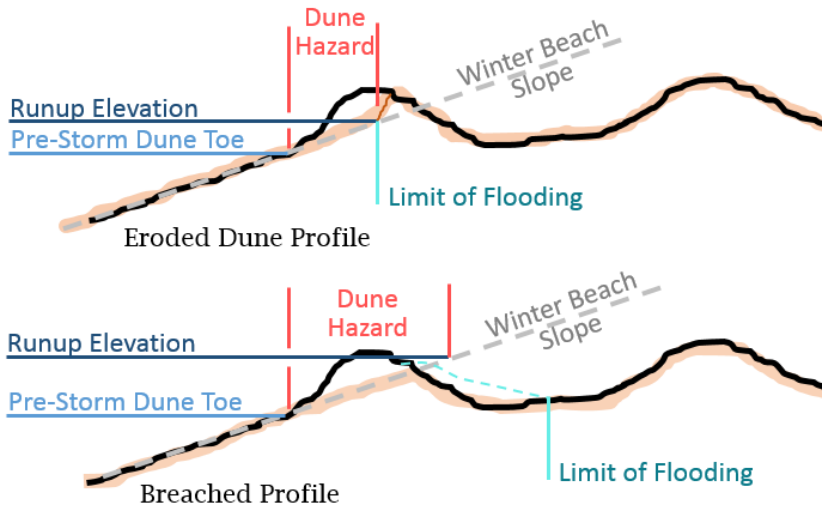


FIGURE 10: SCHEMATIC SHOWING THE MECHANICS OF KOMAR DUNE EROSION METHOD

4.3. COASTAL FLOOD HAZARD ZONE

The coastal flood hazard zone was estimated to be the limits of wave run-up on the eroded beach profile. Wave run-up is the condition of waves breaking on the beach and water "running up" the beach face and/or beachfront structure. Wave run-up extends farther landward than the "still water" level. Wave run-up is a function of wave conditions, which, in turn, are based on storm events, shoreline geometry and still water levels. The landward extents of the still water and run-up elevations (i.e., the intersection of these elevations onto the beach) are based on the profile of the beach face. Wave run-up was calculated using an empirical run-up equation (Stockdon et al. 2006) for this study. The equation was forced with an extreme wave event, as discussed above.

The wave run-up elevation is the combination of tide, SLA, storm surge, and the 2% wave run-up height (Figure 11). On the open-water Western U.S., wave run-up is often the largest of these components. The run-up height for the study area was estimated using a Monte Carlo methodology where the water level, wave constituents, and beach slope are input into the Stockton, et al. (2006) empirical run-up equation. This equation is commonly used to estimate run-up on sandy beaches along the Western U.S. shorelines. The equation is defined as follows:

$$R_{2\%} = 1.1\left(0.35\,\beta_f (H_0 L_0)^{1/2} + \frac{\left[H_0 L_0\left(0.563\,\beta_f^2 + 0.004\right)\right]^{1/2}}{2}\right)$$

Where $R_{2\%}$ is the run-up point reached or exceeded by only 2% of all waves, H_0 is offshore significant wave height, L_0 is offshore significant wavelength and β_f is beach slope. The $R_{2\%}$ run-up level is a common metric for quantifying the maximum elevation inundated during a storm event.

The limit of coastal flooding is tied to the results of the dune erosion analysis and depends on whether the foredune is large enough to withhold the storm or breaches (Figure 1 and Figure 10). A breach is identified if the calculated dune erosion distance was located at an elevation less than the wave run-up elevation. For breaching conditions, the overwash distance was limited to a couple hundred feet for natural surfaces but allowed to expand further for paved and declined overflow pathways. Mapping of the overwash flood hazard required engineering judgement and is highly dependent on the conditions of the back beach.

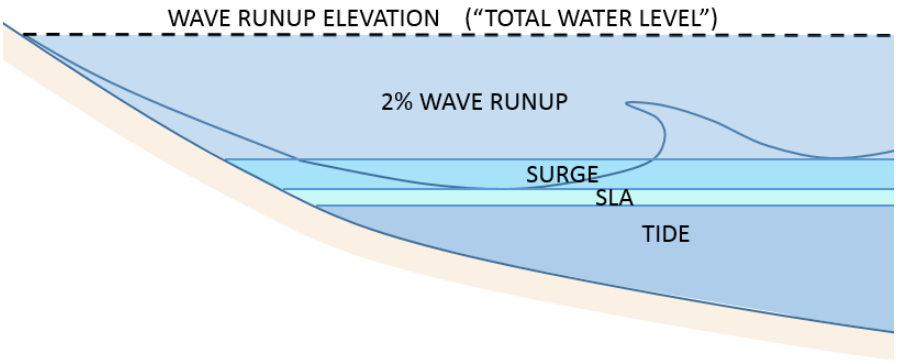


FIGURE 11: COMPONENTS OF WAVE RUN-UP ELEVATION

4.4. BLUFF EROSION HAZARD ZONE

A segment of coastline near the northern city limits consists of a sand and rocky beach backed by coastal bluffs. The shoreline response and dune erosion estimates indicate these bluffs will experience more frequent wave action at the bluff toe as sea levels rise. The increased intensity and extent of wave action at the bluff toe will result in episodic bluff erosion when large waves coincide with high water levels.

Revell et al. (2011) provides a method for predicting future bluff erosion hazards that increases historic erosion rates based on the relative increase in time that the total water level (TWL) exceeds the bluff toe elevation. The study provided state-wide average and maximum bluff erosion rates for a 4.6 ft (1.4 m) sea level rise scenario. In San Luis Obispo County the average cliff erosion was about 50 ft (15 m) with a maximum of 640 ft (195 m). For the region near our study location the bluff retreat for this sea level rise scenario was about 130 ft (40 m). Estimates for the bluff erosion hazard zones for each sea level rise scenario are depicted as a distance landward from the approximate top of bluff. There is a large uncertainty in these estimates due to unknowns associated with geologic make up of these bluffs and the alongshore variability around the adjacent headland. More detailed geological investigation and run-up analysis would be required to develop parcel-specific estimates of bluff erosion and how the hazard will change with sea level rise.

4.5. FLUVIAL FLOOD HAZARD ZONE

Sea level rise can influence flooding along rivers that discharge into tidal waters. 1-D HEC-RAS steady state modeling and analyses were performed to assess the influence of sea level rise during a 100-year

fluvial flood at the most significant rivers that discharge to tidal waters in the City (i.e., Chorro Creek and Morro Creek). These creeks were selected for modeling based on the size of their 100-year flood flow discharge and location. Model results were used to assess the extent of sea level rise influence on upstream water surface elevations in the river.

4.5.1. Model Setup

1-D HEC-RAS models were created for Chorro Creek and Morro Creek. Geographic data from the 2013 NOAA Coastal California TopoBathy Merge Project was compiled in ArcMap 10.1 using the HEC-GeoRAS extension. The data was then exported to HEC-RAS to create the model. The river centerlines were drawn using contour data and aerial imagery. Cross-sections were drawn balancing span length and a perpendicular alignment with the main channel and geographic features. Flow centerlines were also drawn for the left and right floodplain to provide downstream cross-section distance.

Roughness factors (Manning's "n") used in the model were obtained from a range of values specified in the FEMA Flood Insurance Study (FEMA FIS 2012). Roughness factors for Chorro Creek ranged from a channel "n" of 0.015-0.040 and an overbank "n" of 0.045-0.100. Roughness factors for Morro Creek ranged from a channel "n" of 0.015-0.080 and an overbank "n" of 0.045-0.100.

The model developed for Chorro Creek had 36 cross-sections, covering approximately 2 miles of the river extending upstream of the South Bay Boulevard Bridge and downstream to the river outlet into Morro Bay, the model layout is shown in Figure 12. The model developed for Morro Creek has 24 cross-sections, covering approximately 0.5 miles of the river with the upstream end just east of Cabrillo Highway and extending downstream to the river outlet into the Pacific Ocean. The model layout for Morro Creek is shown in Figure 13.

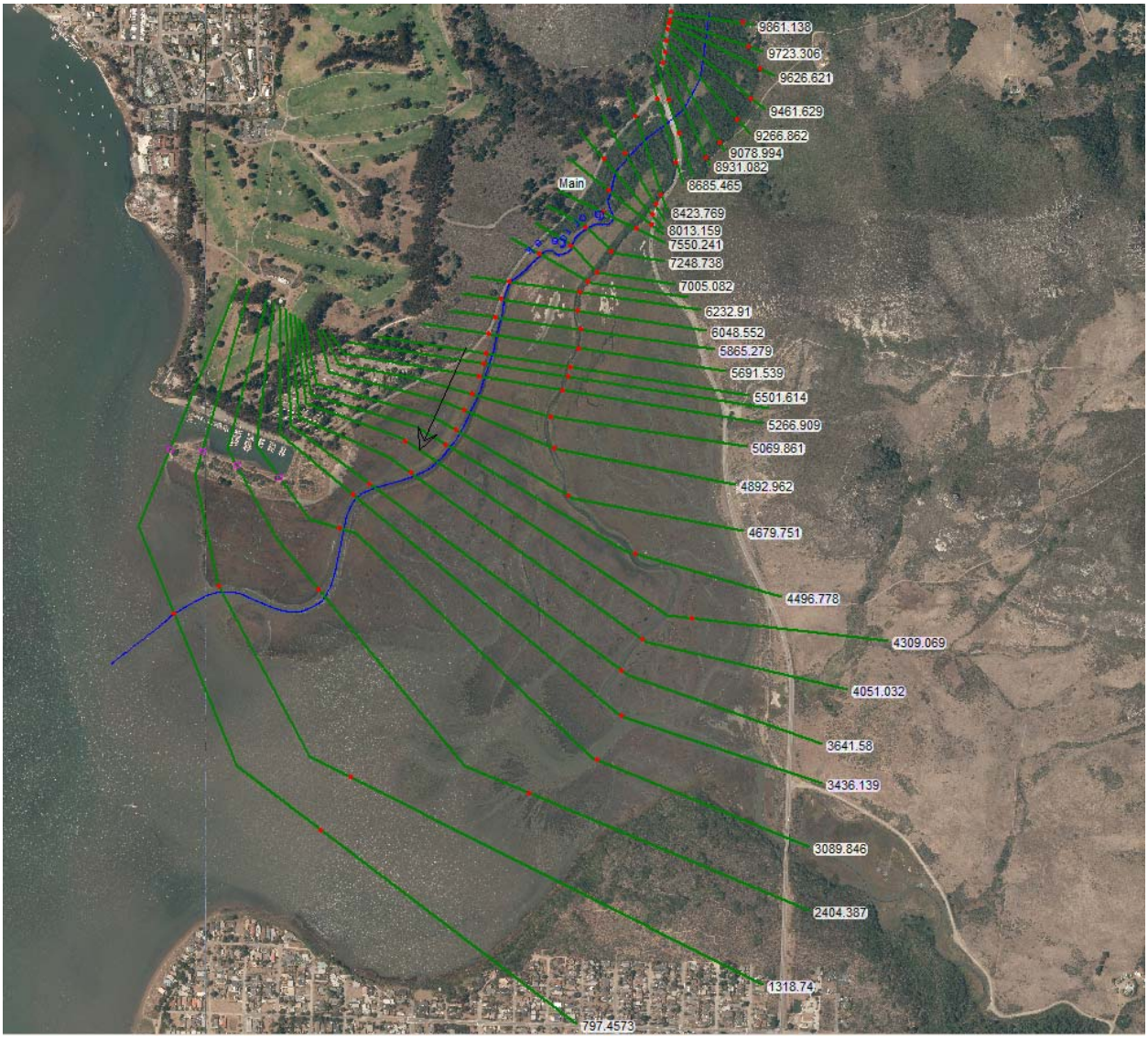


FIGURE 12: HEC-RAS MODEL LAYOUT FOR CHORRO CREEK

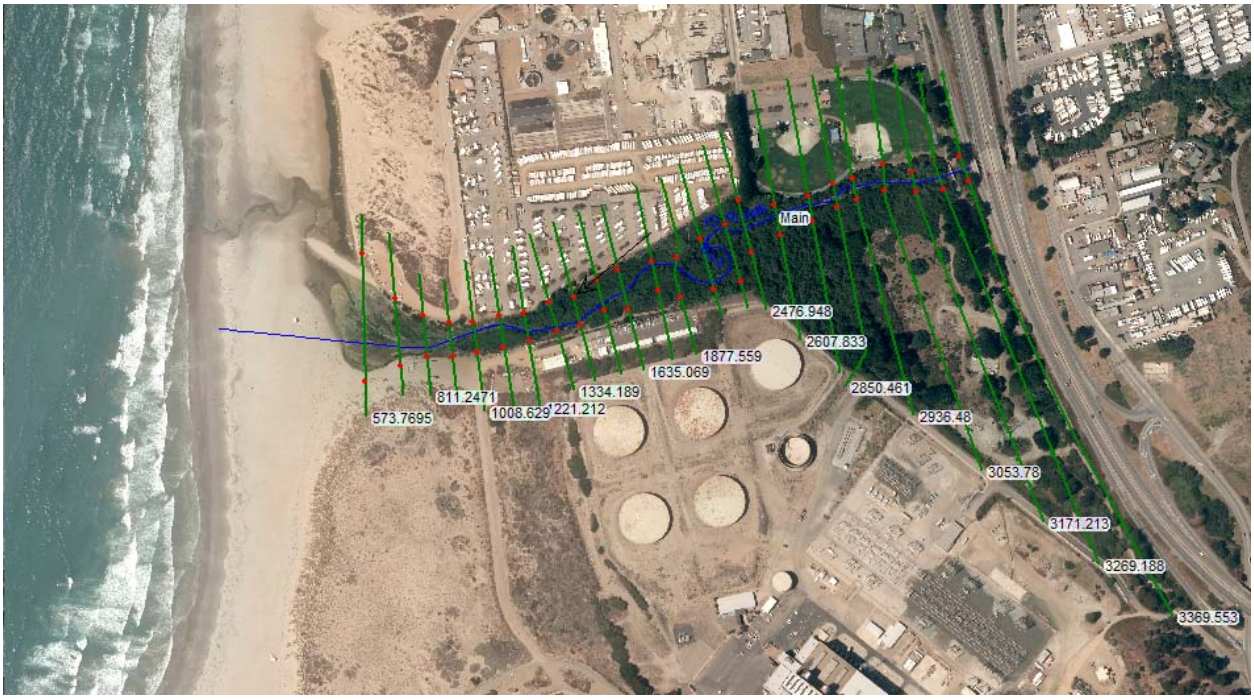


FIGURE 13: HEC-RAS MODEL LAYOUT FOR MORRO CREEK

4.5.2. Model Boundary Conditions

The upstream boundary for each model is controlled by the 100-year flood peak discharge. A 100-year flood has a one percent change of occurring in any given year. The 100-year flood peak discharge was obtained from the FEMA FIS (2012) and is 18,900 cfs for Chorro Creek and 11,800 cfs for Morro Creek.

The downstream boundary for both models is controlled by the tidal water surface elevation. The NOAA tidal gage closest to Morro Bay is located at Port San Luis, California (NOAA Station No.: 9412110). Mean higher high water (MHHW) was selected as the baseline tidal datum for the sea level rise modeling effort. The downstream model boundary assumes still water conditions where sea level rise scenarios were added to MHHW (i.e., 5.24 ft), as summarized in Table 5 below.

TABLE 5: DOWNSTREAM MODEL BOUNDARY CONDITIONS

Time Horizon	SLR Projection (ft)	Still Water Surface Elevation (ft, NAVD 88)
Current MHHW	0	5.24
2030	1.0	6.24
2050	2.0	7.24
2100	5.5	10.74

4.5.3. Chorro Creek

Steady state model runs were performed for Chorro Creek with current and projected sea level conditions during a 100-year flood. Model results under the 100-year flood and MHHW sea level condition were agreeable with water surface elevations shown on the FEMA FIRM map number 06079C1027G, panel 1027 of 2050 (2012). Additional model runs were performed for the projected sea level rise scenarios and results are summarized in Table 6 below.

TABLE 6: CHORRO CREEK MODELING SUMMARY

Time Horizon	Upper Range SLR (ft)	100-year Fluvial Flood (cfs)	Limit of Upstream Influence (HEC-RAS X-Section No.)
Current MHHW	0	18,900	N/A
2030	1.0	18,900	4496
2050	2.0	18,900	5501
2100	5.5	18,900	7808

These results show the water surface elevation migrating upstream with increased sea level rise, this is to be expected for a wide and flat wetland area with subcritical flow during a flood event. As shown in Figure 14, a modest increase is seen in the water surface elevation in the immediate vicinity of the downstream boundary and the flood flow profile interface. The increase in water surface elevation is localized and does not extend upstream of the downstream boundary and flood flow profile interface (where the tidal water surface elevation meets the flood water surface elevation); therefore, the influence of sea level rise was not found to result in the backup of flood waters in Chorro Creek. The influence of sea level rise on Chorro Creek is limited to the extent of tidal inundation and is not expected to increase the limits of fluvial flooding during an extreme event. Thus, no additional fluvial flood hazards as a result of sea level rise are anticipated at Chorro Creek.

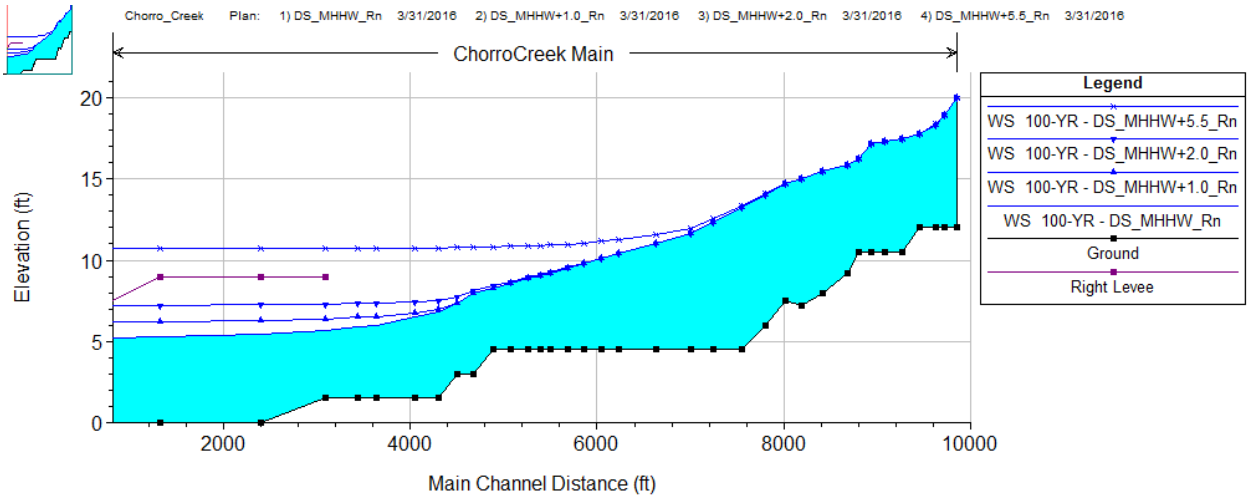


FIGURE 14: CHORRO CREEK WATER SURFACE PROFILE.

4.5.4. Morro Creek

Steady state model runs were performed for Morro Creek using the same downstream boundary as Chorro Creek during a 100-year flood. Model results under the 100-year flood and MHHW sea level condition were agreeable with water surface elevations shown on the FEMA FIRM map number 06079C0813G, panel 813 of 2050 (2012). Additional model runs were performed for the projected sea level rise scenarios.

Model results indicate that a supercritical flow regime develops during the 100-year fluvial flood in the downstream reach of Morro Creek. Supercritical flow develops as a result of the contraction created by Morro Dunes RV Park to the north and the berm to the south, this flow regime continues until the flood flow passes through the dunes and onto the beach. Sea level rise does not increase fluvial flooding in Morro Creek; due to the supercritical flow regime, tidal velocities are not able to overcome the fluvial flood

velocity. As shown in Figure 15 below, sea level rise does not result in floodwater backup and does not increase upstream water surface elevations in Morro Creek.

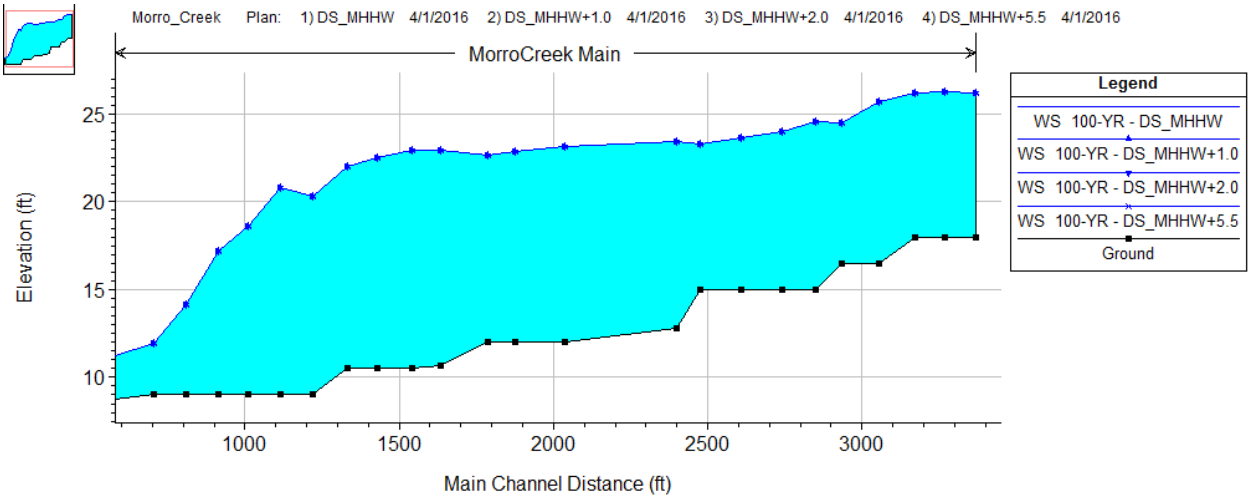


FIGURE 15: MORRO CREEK WATER SURFACE PROFILE

Water surface elevations listed on the FEMA FIRM (2012) should be used for planning purposes upstream of the Beach. No additional fluvial flood hazards as a result of sea level rise are anticipated at Morro Creek.

4.5.5. Other Creeks

Three additional creeks in the city of Morro Bay outlet into the ocean: Toro Creek, Unnamed Creek (Alva Paul Creek), and Noname Creek. The influence of sea level rise in these creeks is expected to be similar to that at Chorro Creek and Morro Creek. Sea level rise is not expected to backup floodwaters and increase fluvial flooding resulting from these creeks. The creeks outlet onto the beach and are subject to tidal inundation and wave run-up. Thus, no additional fluvial flood hazards as a result of sea level rise are anticipated.

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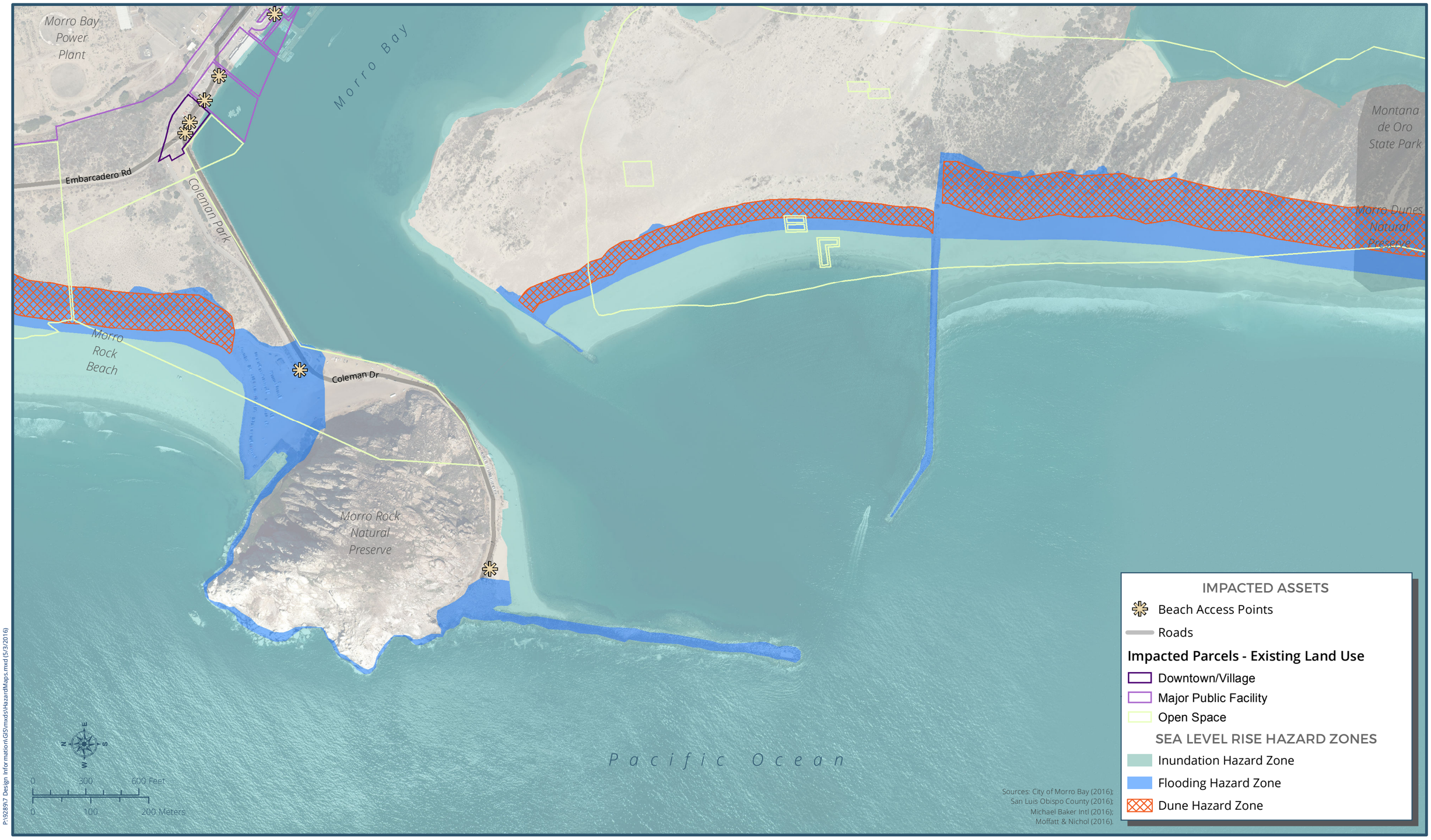
Appendix B: Sea Level Rise Hazard Figures



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Plan MORRO BAY

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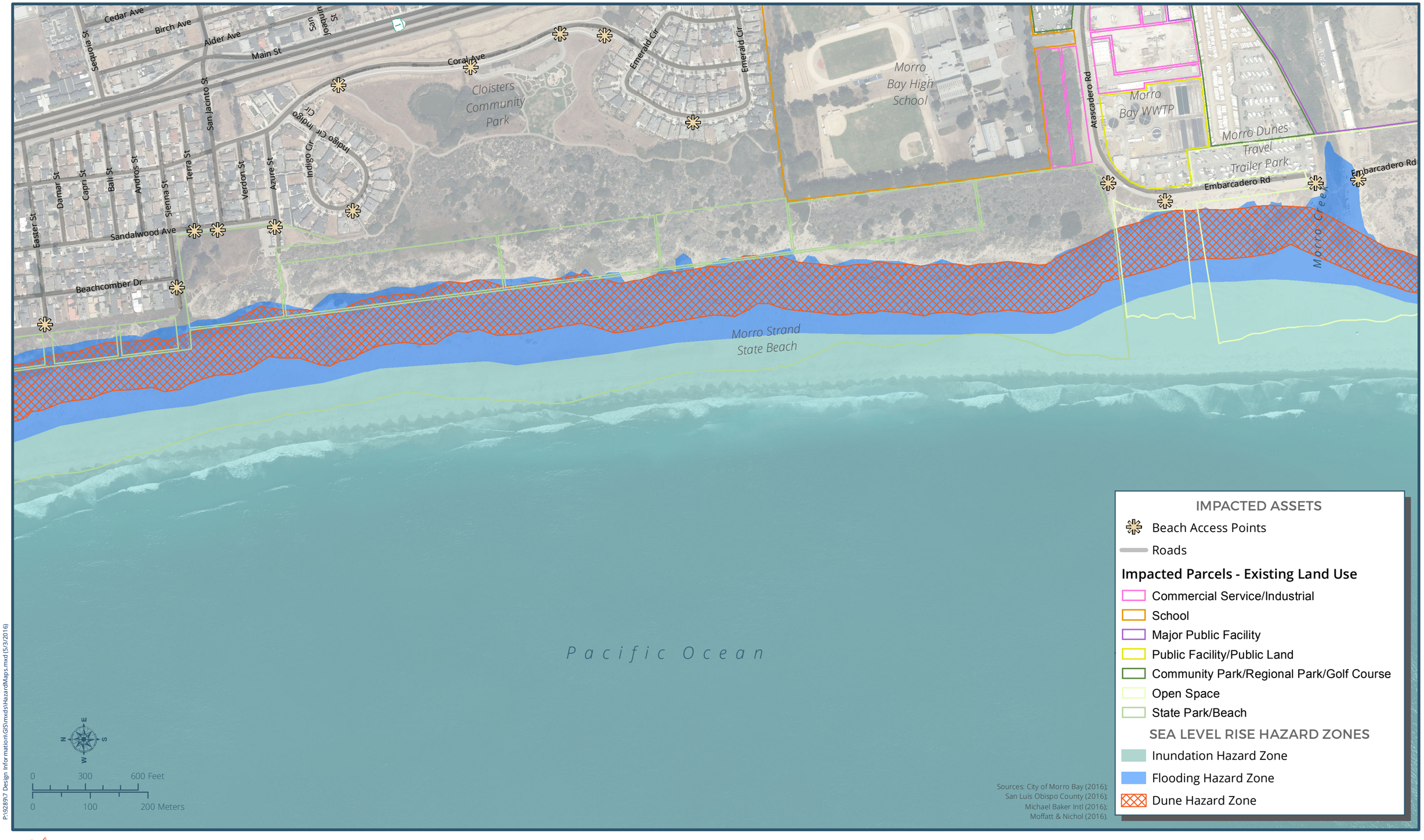

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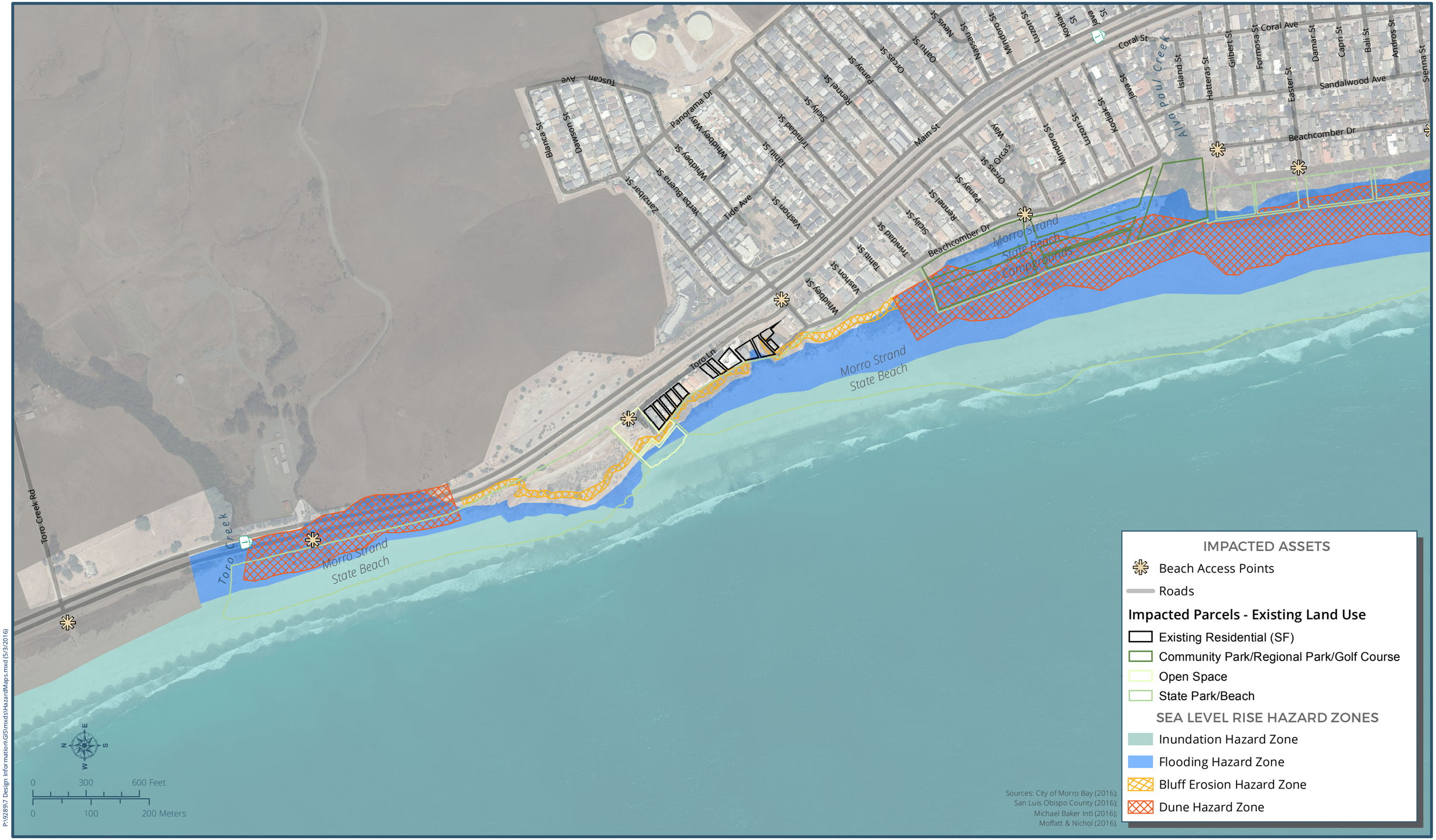
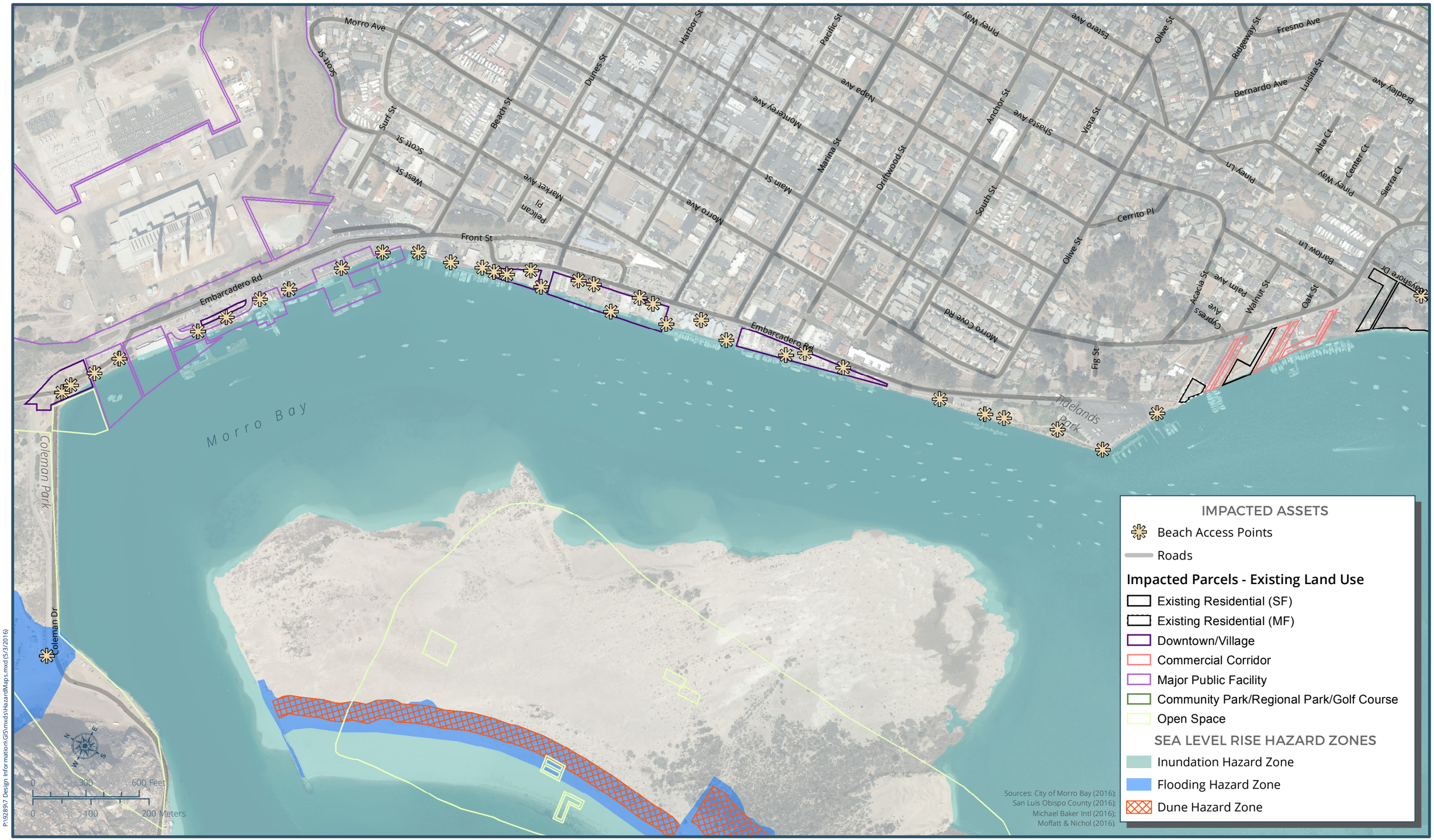


Plan MORRO BAY

YEAR 2030 SEA LEVEL RISE HAZARDS

Plate 3 of 5



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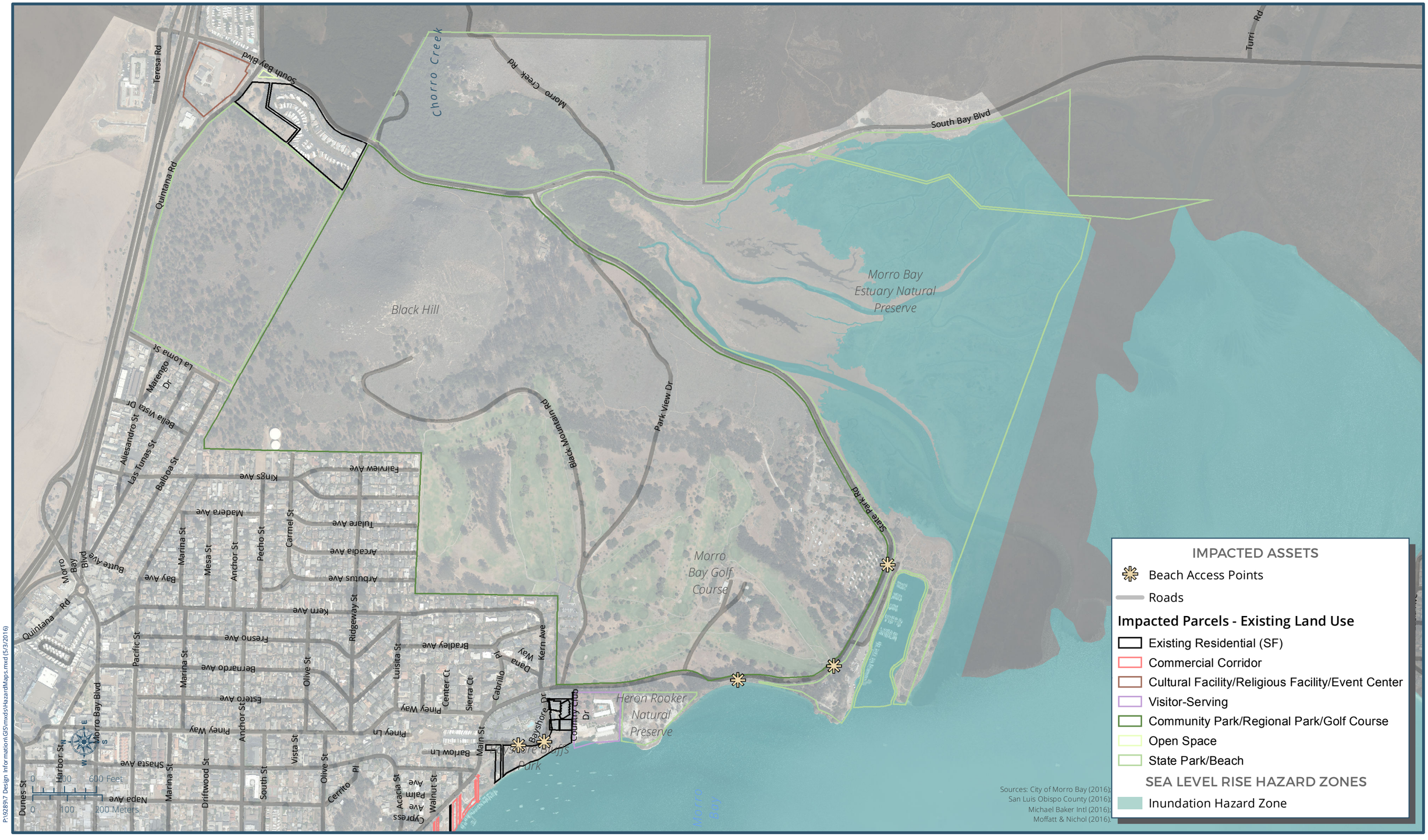

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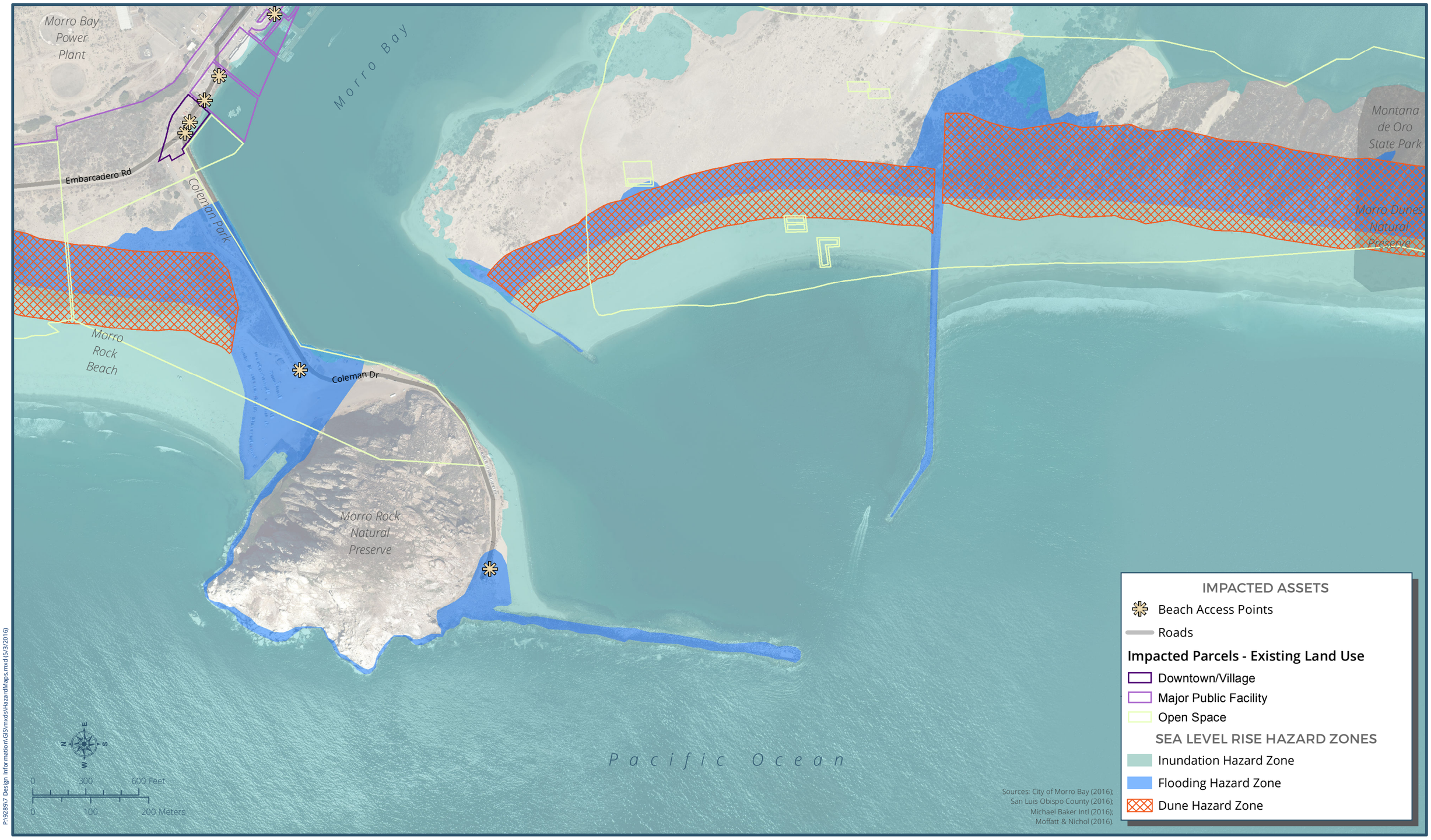
Plan MORRO BAY

YEAR 2030 SEA LEVEL RISE HAZARDS

Plate 5 of 5



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Plan MORRO BAY

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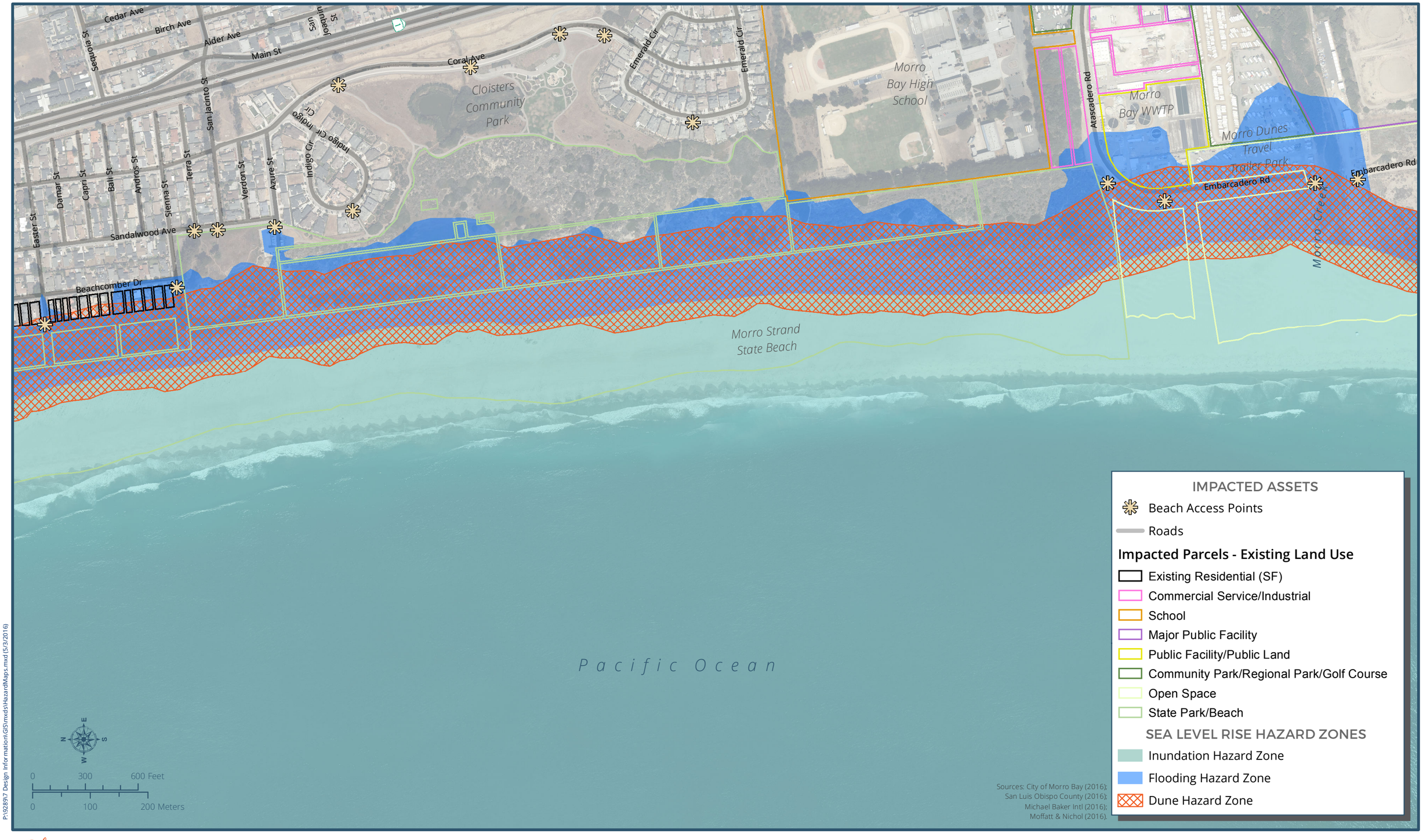

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Plan MORRO BAY

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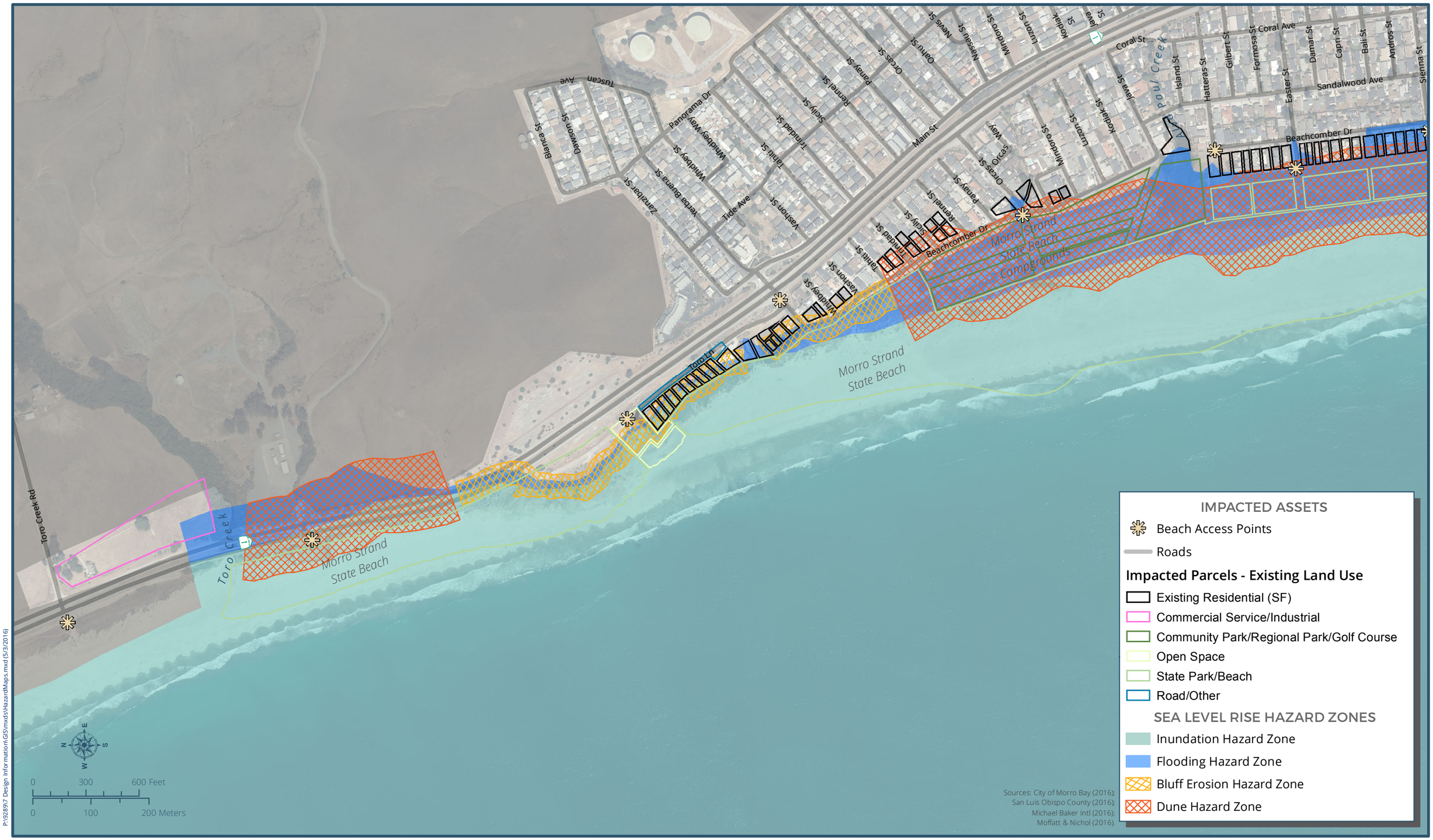

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Plan MORRO BAY

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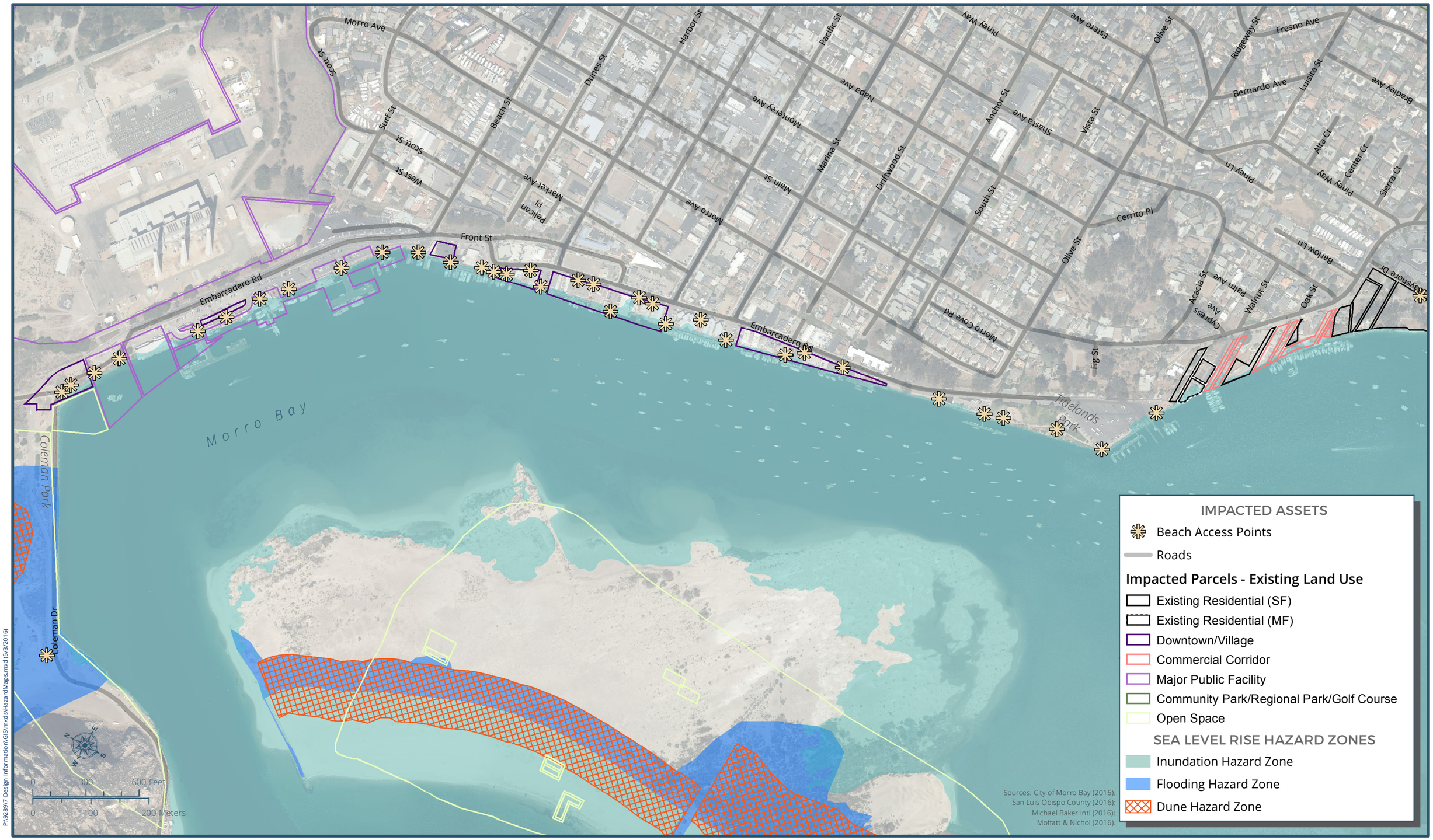

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Plan MORRO BAY

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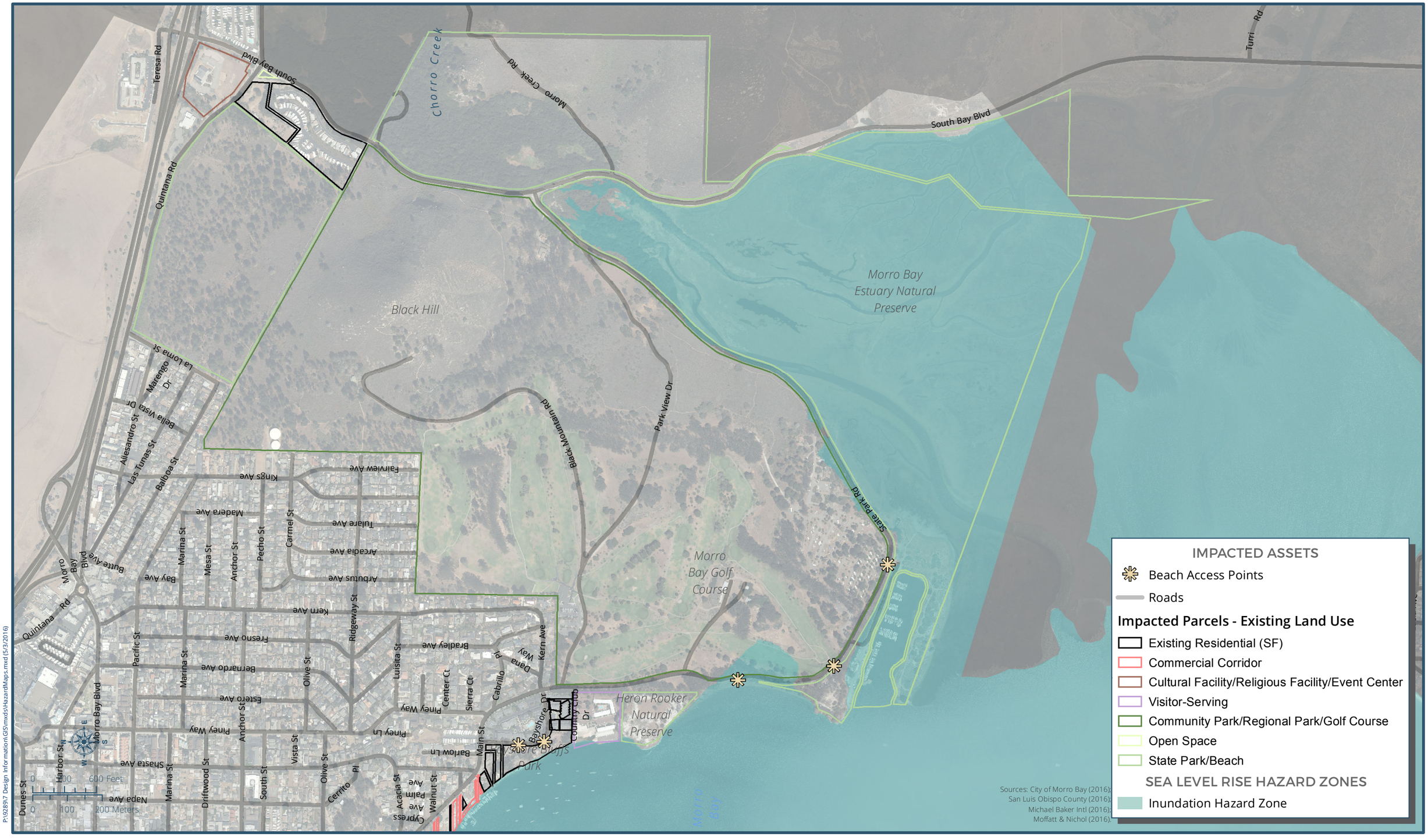

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Plan MORRO BAY

YEAR 2100 SEA LEVEL RISE HAZARDS

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Appendix C: Noise Measurement Data

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L(30)	61.2	61.1	61.1	61.1	61.1	61.1	61.1	61.0	61.0
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L(70)	60.5	60.5	60.5	60.5	60.5	60.4	60.4	60.4	60.4
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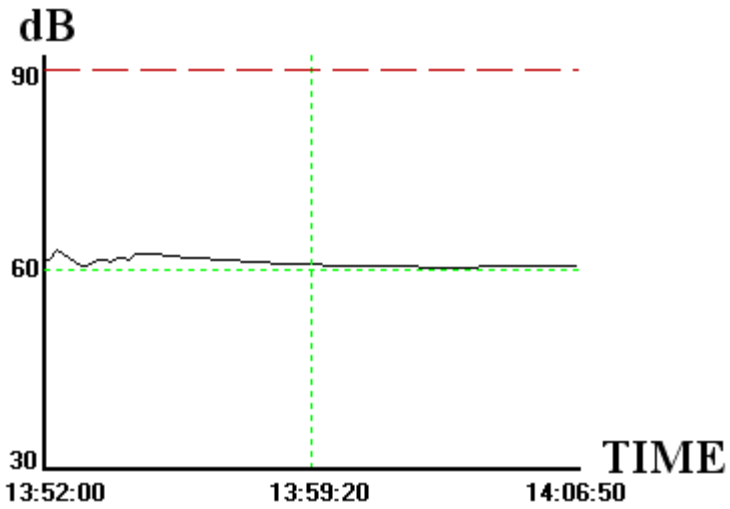
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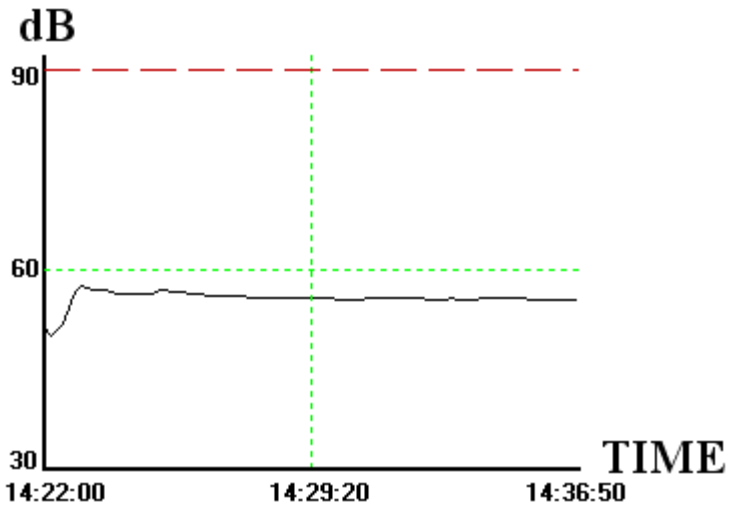
56.1,14:26:40,
56.0,14:26:50,
56.0,14:27:00,
55.9,14:27:10,
55.9,14:27:20,
55.9,14:27:30,
55.8,14:27:40,
55.8,14:27:50,
55.8,14:28:00,
55.8,14:28:10,
55.7,14:28:20,
55.6,14:28:30,
55.6,14:28:40,
55.6,14:28:50,
55.6,14:29:00,
55.8,14:29:10,
55.7,14:29:20,
55.7,14:29:30,
55.6,14:29:40,
55.6,14:29:50,
55.6,14:30:00,
55.5,14:30:10,
55.5,14:30:20,
55.5,14:30:30,
55.5,14:30:40,
55.4,14:30:50,
55.6,14:31:00,
55.8,14:31:10,
55.8,14:31:20,
55.8,14:31:30,
55.7,14:31:40,
55.7,14:31:50,
55.7,14:32:00,
55.6,14:32:10,
55.6,14:32:20,
55.6,14:32:30,
55.5,14:32:40,
55.5,14:32:50,
55.5,14:33:00,
55.4,14:33:10,
55.6,14:33:20,
55.5,14:33:30,
55.5,14:33:40,
55.5,14:33:50,

55.5,14:34:00,
55.6,14:34:10,
55.7,14:34:20,
55.6,14:34:30,
55.6,14:34:40,
55.6,14:34:50,
55.6,14:35:00,
55.6,14:35:10,
55.6,14:35:20,
55.5,14:35:30,
55.5,14:35:40,
55.5,14:35:50,
55.5,14:36:00,
55.5,14:36:10,
55.4,14:36:20,
55.4,14:36:30,
55.4,14:36:40,
55.4,14:36:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	57.5	57.1	56.9	56.9	56.9	56.8	56.8	56.7	56.7
L(10)	56.6	56.6	56.5	56.4	56.4	56.4	56.3	56.3	56.3
L(20)	56.2	56.2	56.2	56.2	56.1	56.1	56.0	56.0	55.9
L(30)	55.9	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8
L(40)	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.6
L(50)	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6
L(60)	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6
L(70)	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5
L(80)	55.5	55.5	55.5	55.5	55.5	55.5	55.4	55.4	55.4
L(90)	55.4	55.4	55.4	54.1	51.8	51.1	51.0	49.9	49.9


dB
90
60
30
TIME
14:22:00
14:29:20
14:36:50

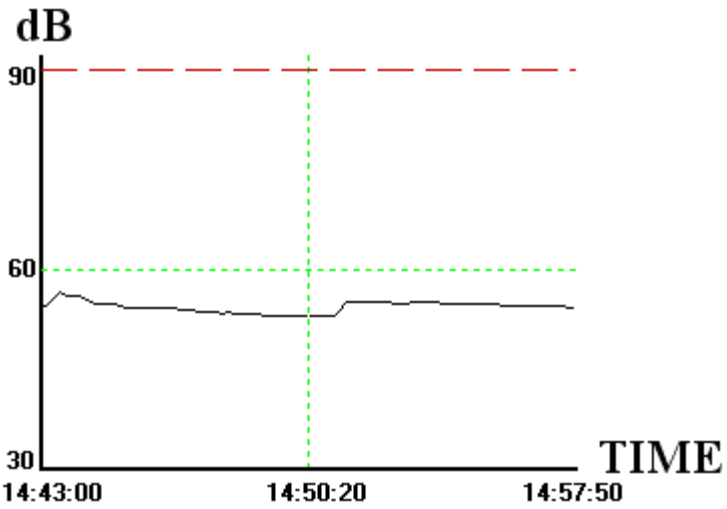
Date Time=04/06/16 14:43:00
Sampling Time=10
Record Num= 90
Leq Value=54.3 SEL Value=83.8
MAX Value=77.6
MIN Value=44.9
Freq Weighting=A Time Weighting=Fast

Measurement 3

54.1,14:43:00,
54.7,14:43:10,
55.7,14:43:20,
56.6,14:43:30,
56.1,14:43:40,
55.9,14:43:50,
56.0,14:44:00,
55.6,14:44:10,
55.2,14:44:20,
54.8,14:44:30,
54.9,14:44:40,
54.8,14:44:50,
54.8,14:45:00,
54.6,14:45:10,
54.3,14:45:20,
54.2,14:45:30,
54.1,14:45:40,
54.2,14:45:50,
54.3,14:46:00,
54.2,14:46:10,
54.1,14:46:20,
54.1,14:46:30,
54.1,14:46:40,
54.0,14:46:50,
53.9,14:47:00,
53.8,14:47:10,
53.7,14:47:20,
53.7,14:47:30,
53.6,14:47:40,
53.5,14:47:50,
53.4,14:48:00,
53.5,14:48:10,
53.4,14:48:20,
53.4,14:48:30,
53.3,14:48:40,
53.2,14:48:50,
53.2,14:49:00,
53.1,14:49:10,
53.0,14:49:20,
53.0,14:49:30,
52.9,14:49:40,
52.9,14:49:50,
52.9,14:50:00,
52.9,14:50:10,
53.1,14:50:20,
53.1,14:50:30,
53.0,14:50:40,
52.9,14:50:50,
52.9,14:51:00,
52.9,14:51:10,
54.0,14:51:20,
55.0,14:51:30,
55.2,14:51:40,
55.2,14:51:50,
55.2,14:52:00,
55.1,14:52:10,
55.1,14:52:20,
55.0,14:52:30,
55.0,14:52:40,
54.9,14:52:50,
54.9,14:53:00,
54.9,14:53:10,
55.0,14:53:20,
55.0,14:53:30,
55.0,14:53:40,
55.0,14:53:50,
55.0,14:54:00,
54.9,14:54:10,
54.9,14:54:20,
54.9,14:54:30,
54.9,14:54:40,
54.9,14:54:50,

54.8,14:55:00,
54.8,14:55:10,
54.7,14:55:20,
54.7,14:55:30,
54.7,14:55:40,
54.6,14:55:50,
54.6,14:56:00,
54.6,14:56:10,
54.6,14:56:20,
54.5,14:56:30,
54.5,14:56:40,
54.4,14:56:50,
54.4,14:57:00,
54.4,14:57:10,
54.4,14:57:20,
54.4,14:57:30,
54.3,14:57:40,
54.3,14:57:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	56.6	56.1	56.0	55.9	55.7	55.6	55.2	55.2	55.2
L(10)	55.2	55.1	55.1	55.0	55.0	55.0	55.0	55.0	55.0
L(20)	55.0	55.0	54.9	54.9	54.9	54.9	54.9	54.9	54.9
L(30)	54.9	54.8	54.8	54.8	54.8	54.8	54.8	54.7	54.7
L(40)	54.7	54.6	54.6	54.6	54.6	54.6	54.6	54.5	54.5
L(50)	54.4	54.4	54.4	54.4	54.4	54.3	54.3	54.3	54.3
L(60)	54.2	54.2	54.1	54.1	54.1	54.1	54.1	54.1	54.0
L(70)	53.9	53.8	53.7	53.7	53.6	53.5	53.5	53.5	53.4
L(80)	53.4	53.3	53.2	53.2	53.1	53.1	53.1	53.1	53.0
L(90)	53.0	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9

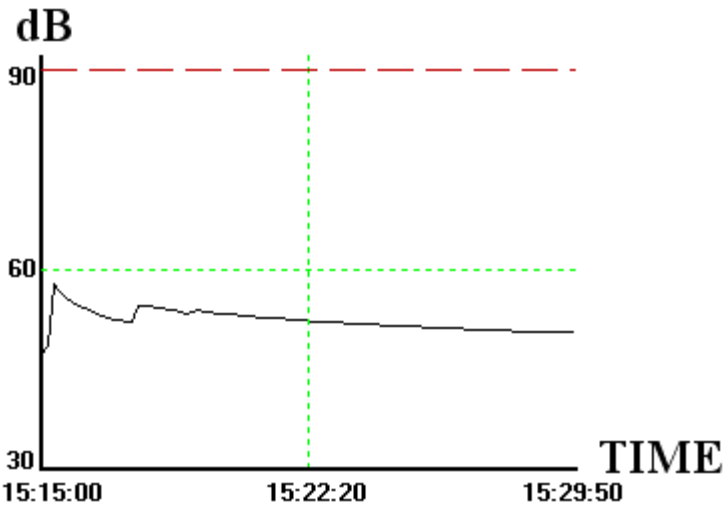

dB
90
60
30
TIME
14:43:00
14:50:20
14:57:50

Measurement 4

Date Time=04/06/16 15:15:00
Sampling Time=10
Record Num= 90
Leq Value=50.7 SEL Value=80.2
MAX Value=71.9
MIN Value=41.6
Freq Weighting=A Time Weighting=Fast
47.4,15:15:00,
48.6,15:15:10,
57.8,15:15:20,
56.7,15:15:30,
55.8,15:15:40,
55.0,15:15:50,
54.4,15:16:00,
54.1,15:16:10,
53.8,15:16:20,
53.4,15:16:30,
53.1,15:16:40,
52.8,15:16:50,
52.5,15:17:00,
52.3,15:17:10,
52.2,15:17:20,
52.1,15:17:30,
54.6,15:17:40,
54.4,15:17:50,
54.4,15:18:00,
54.2,15:18:10,
54.1,15:18:20,
53.9,15:18:30,
53.8,15:18:40,
53.6,15:18:50,
53.4,15:19:00,
53.5,15:19:10,
53.8,15:19:20,
53.7,15:19:30,
53.5,15:19:40,
53.4,15:19:50,
53.3,15:20:00,
53.3,15:20:10,
53.2,15:20:20,
53.1,15:20:30,
53.0,15:20:40,
52.9,15:20:50,
52.8,15:21:00,
52.8,15:21:10,
52.7,15:21:20,
52.6,15:21:30,
52.6,15:21:40,
52.5,15:21:50,
52.4,15:22:00,
52.4,15:22:10,
52.3,15:22:20,
52.2,15:22:30,
52.2,15:22:40,
52.1,15:22:50,
52.1,15:23:00,
52.0,15:23:10,
52.0,15:23:20,
51.9,15:23:30,
51.9,15:23:40,
51.9,15:23:50,
51.8,15:24:00,
51.7,15:24:10,
51.7,15:24:20,
51.6,15:24:30,
51.6,15:24:40,
51.5,15:24:50,
51.5,15:25:00,
51.4,15:25:10,
51.4,15:25:20,
51.4,15:25:30,
51.3,15:25:40,
51.3,15:25:50,
51.2,15:26:00,
51.2,15:26:10,
51.1,15:26:20,
51.1,15:26:30,
51.1,15:26:40,
51.0,15:26:50,

51.0,15:27:00,
51.0,15:27:10,
50.9,15:27:20,
50.9,15:27:30,
50.8,15:27:40,
50.8,15:27:50,
50.8,15:28:00,
50.7,15:28:10,
50.7,15:28:20,
50.7,15:28:30,
50.6,15:28:40,
50.6,15:28:50,
50.6,15:29:00,
50.6,15:29:10,
50.6,15:29:20,
50.7,15:29:30,
50.7,15:29:40,
50.7,15:29:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	57.8	56.7	55.8	55.0	54.6	54.4	54.4	54.4	54.2
L(10)	54.1	54.1	53.9	53.8	53.8	53.8	53.7	53.6	53.5
L(20)	53.4	53.4	53.4	53.4	53.3	53.3	53.2	53.1	53.1
L(30)	52.9	52.8	52.8	52.8	52.8	52.7	52.6	52.6	52.5
L(40)	52.4	52.4	52.3	52.3	52.3	52.2	52.2	52.2	52.1
L(50)	52.1	52.0	52.0	51.9	51.9	51.9	51.9	51.8	51.7
L(60)	51.6	51.6	51.5	51.5	51.4	51.4	51.4	51.4	51.3
L(70)	51.2	51.2	51.1	51.1	51.1	51.0	51.0	51.0	51.0
L(80)	50.9	50.8	50.8	50.8	50.7	50.7	50.7	50.7	50.7
L(90)	50.7	50.6	50.6	50.6	50.6	50.6	48.6	47.4	47.4

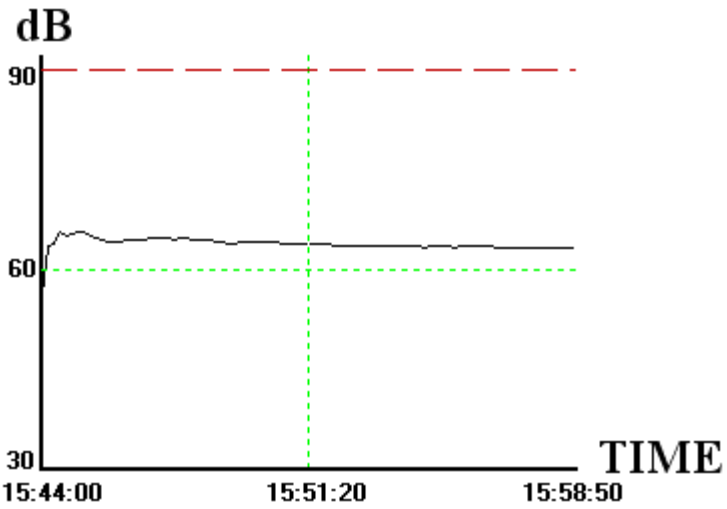

dB
90
60
30
TIME
15:15:00
15:22:20
15:29:50

Measurement 5

Date Time=04/06/16 15:44:00
Sampling Time=10
Record Num= 90
Leq Value=63.2 SEL Value=92.8
MAX Value=73.6
MIN Value=45.9
Freq Weighting=A Time Weighting=Fast
56.0,15:44:00,
63.5,15:44:10,
63.8,15:44:20,
65.7,15:44:30,
65.1,15:44:40,
65.2,15:44:50,
65.7,15:45:00,
65.5,15:45:10,
65.1,15:45:20,
64.8,15:45:30,
64.5,15:45:40,
64.2,15:45:50,
64.2,15:46:00,
64.2,15:46:10,
64.4,15:46:20,
64.5,15:46:30,
64.5,15:46:40,
64.5,15:46:50,
64.8,15:47:00,
64.8,15:47:10,
64.7,15:47:20,
64.7,15:47:30,
64.5,15:47:40,
64.6,15:47:50,
64.6,15:48:00,
64.5,15:48:10,
64.4,15:48:20,
64.4,15:48:30,
64.3,15:48:40,
64.2,15:48:50,
64.1,15:49:00,
63.9,15:49:10,
63.9,15:49:20,
64.0,15:49:30,
64.0,15:49:40,
64.0,15:49:50,
64.0,15:50:00,
64.1,15:50:10,
64.1,15:50:20,
64.0,15:50:30,
63.9,15:50:40,
63.9,15:50:50,
63.9,15:51:00,
63.9,15:51:10,
63.8,15:51:20,
63.8,15:51:30,
63.8,15:51:40,
63.7,15:51:50,
63.7,15:52:00,
63.6,15:52:10,
63.5,15:52:20,
63.5,15:52:30,
63.5,15:52:40,
63.4,15:52:50,
63.4,15:53:00,
63.5,15:53:10,
63.5,15:53:20,
63.5,15:53:30,
63.5,15:53:40,
63.5,15:53:50,
63.5,15:54:00,
63.4,15:54:10,
63.4,15:54:20,
63.4,15:54:30,
63.3,15:54:40,
63.4,15:54:50,
63.4,15:55:00,
63.4,15:55:10,
63.4,15:55:20,
63.3,15:55:30,
63.4,15:55:40,
63.4,15:55:50,

63.4,15:56:00,
63.4,15:56:10,
63.4,15:56:20,
63.4,15:56:30,
63.3,15:56:40,
63.3,15:56:50,
63.2,15:57:00,
63.3,15:57:10,
63.3,15:57:20,
63.3,15:57:30,
63.3,15:57:40,
63.2,15:57:50,
63.2,15:58:00,
63.2,15:58:10,
63.2,15:58:20,
63.3,15:58:30,
63.2,15:58:40,
63.2,15:58:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	65.7	65.7	65.5	65.2	65.1	65.1	64.8	64.8	64.8
L(10)	64.7	64.7	64.6	64.6	64.5	64.5	64.5	64.5	64.5
L(20)	64.4	64.4	64.4	64.4	64.3	64.2	64.2	64.2	64.2
L(30)	64.1	64.1	64.1	64.0	64.0	64.0	64.0	64.0	63.9
L(40)	63.9	63.9	63.9	63.9	63.9	63.8	63.8	63.8	63.8
L(50)	63.7	63.6	63.5	63.5	63.5	63.5	63.5	63.5	63.5
L(60)	63.5	63.5	63.5	63.4	63.4	63.4	63.4	63.4	63.4
L(70)	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4
L(80)	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
L(90)	63.2	63.2	63.2	63.2	63.2	63.2	63.2	56.0	56.0

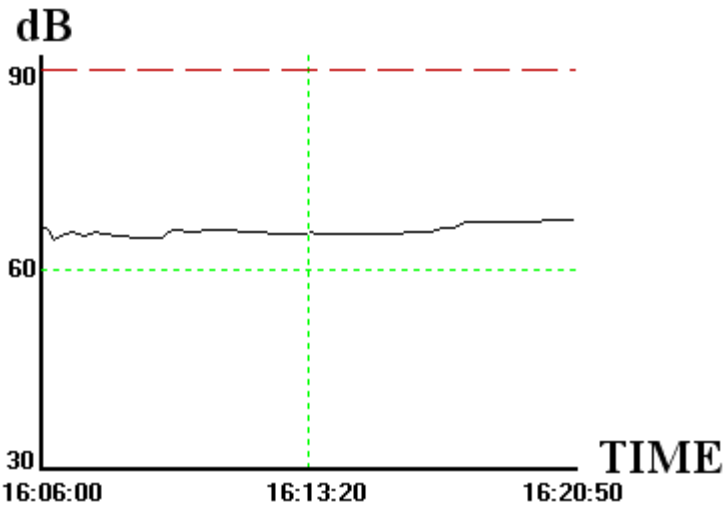

dB
90
60
30
TIME
15:44:00
15:51:20
15:58:50

Measurement 6

Date Time=04/06/16 16:06:00
Sampling Time=10
Record Num= 90
Leq Value=67.6 SEL Value=97.1
MAX Value=86.2
MIN Value=50.2
Freq Weighting=A Time Weighting=Fast
66.5,16:06:00,
65.8,16:06:10,
64.3,16:06:20,
64.9,16:06:30,
65.4,16:06:40,
65.6,16:06:50,
65.2,16:07:00,
65.0,16:07:10,
65.2,16:07:20,
65.5,16:07:30,
65.4,16:07:40,
65.2,16:07:50,
65.1,16:08:00,
65.0,16:08:10,
64.9,16:08:20,
64.8,16:08:30,
64.8,16:08:40,
64.7,16:08:50,
64.8,16:09:00,
64.7,16:09:10,
64.7,16:09:20,
65.7,16:09:30,
65.8,16:09:40,
65.8,16:09:50,
65.7,16:10:00,
65.7,16:10:10,
65.7,16:10:20,
65.9,16:10:30,
65.9,16:10:40,
65.8,16:10:50,
65.8,16:11:00,
65.8,16:11:10,
65.8,16:11:20,
65.7,16:11:30,
65.6,16:11:40,
65.6,16:11:50,
65.6,16:12:00,
65.5,16:12:10,
65.4,16:12:20,
65.3,16:12:30,
65.4,16:12:40,
65.4,16:12:50,
65.4,16:13:00,
65.4,16:13:10,
65.3,16:13:20,
65.5,16:13:30,
65.4,16:13:40,
65.4,16:13:50,
65.4,16:14:00,
65.4,16:14:10,
65.3,16:14:20,
65.3,16:14:30,
65.2,16:14:40,
65.2,16:14:50,
65.2,16:15:00,
65.3,16:15:10,
65.3,16:15:20,
65.3,16:15:30,
65.3,16:15:40,
65.3,16:15:50,
65.4,16:16:00,
65.6,16:16:10,
65.6,16:16:20,
65.6,16:16:30,
65.5,16:16:40,
65.6,16:16:50,
66.0,16:17:00,
66.1,16:17:10,
66.2,16:17:20,
66.2,16:17:30,
66.8,16:17:40,
67.2,16:17:50,

67.2,16:18:00,
67.1,16:18:10,
67.1,16:18:20,
67.1,16:18:30,
67.1,16:18:40,
67.1,16:18:50,
67.0,16:19:00,
67.0,16:19:10,
67.0,16:19:20,
67.0,16:19:30,
67.0,16:19:40,
67.0,16:19:50,
67.3,16:20:00,
67.5,16:20:10,
67.5,16:20:20,
67.5,16:20:30,
67.5,16:20:40,
67.5,16:20:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	67.5	67.5	67.5	67.5	67.5	67.3	67.2	67.2	67.1
L(10)	67.1	67.1	67.1	67.1	67.0	67.0	67.0	67.0	67.0
L(20)	66.8	66.8	66.5	66.2	66.2	66.1	66.0	65.9	65.9
L(30)	65.8	65.8	65.8	65.8	65.8	65.8	65.8	65.7	65.7
L(40)	65.7	65.7	65.6	65.6	65.6	65.6	65.6	65.6	65.6
L(50)	65.6	65.5	65.5	65.5	65.5	65.5	65.4	65.4	65.4
L(60)	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4
L(70)	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3
L(80)	65.2	65.2	65.2	65.2	65.2	65.1	65.0	65.0	65.0
L(90)	64.9	64.8	64.8	64.8	64.7	64.7	64.7	64.3	64.3

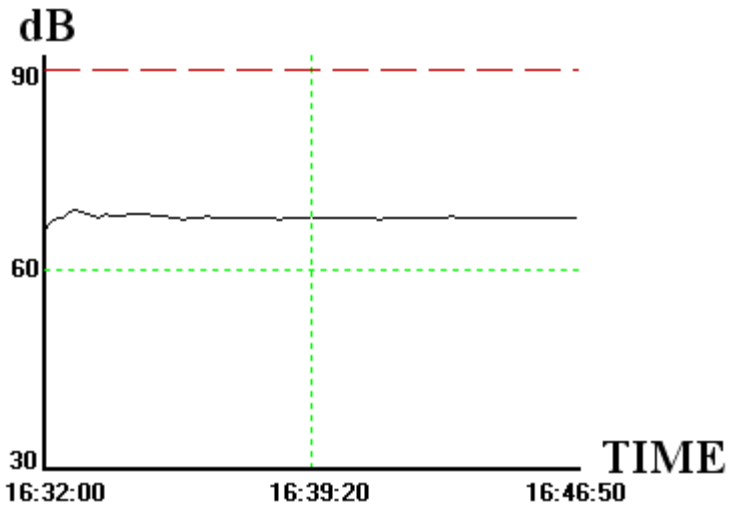

dB
90
60
30
TIME
16:06:00
16:13:20
16:20:50

Measurement 7

Date Time=04/06/16 16:32:00
Sampling Time=10
Record Num= 90
Leq Value=67.6 SEL Value=97.2
MAX Value=76.9
MIN Value=45.0
Freq Weighting=A Time Weighting=Fast
66.0,16:32:00,
67.0,16:32:10,
67.8,16:32:20,
67.7,16:32:30,
68.7,16:32:40,
69.0,16:32:50,
68.7,16:33:00,
68.3,16:33:10,
67.9,16:33:20,
67.6,16:33:30,
68.3,16:33:40,
68.1,16:33:50,
67.9,16:34:00,
68.1,16:34:10,
68.4,16:34:20,
68.2,16:34:30,
68.3,16:34:40,
68.2,16:34:50,
68.1,16:35:00,
68.1,16:35:10,
67.9,16:35:20,
67.7,16:35:30,
67.6,16:35:40,
67.5,16:35:50,
67.6,16:36:00,
67.8,16:36:10,
67.8,16:36:20,
67.9,16:36:30,
67.8,16:36:40,
67.7,16:36:50,
67.8,16:37:00,
67.8,16:37:10,
67.8,16:37:20,
67.8,16:37:30,
67.6,16:37:40,
67.6,16:37:50,
67.6,16:38:00,
67.6,16:38:10,
67.6,16:38:20,
67.5,16:38:30,
67.7,16:38:40,
67.7,16:38:50,
67.7,16:39:00,
67.7,16:39:10,
67.7,16:39:20,
67.7,16:39:30,
67.7,16:39:40,
67.7,16:39:50,
67.7,16:40:00,
67.7,16:40:10,
67.6,16:40:20,
67.6,16:40:30,
67.6,16:40:40,
67.6,16:40:50,
67.6,16:41:00,
67.6,16:41:10,
67.5,16:41:20,
67.6,16:41:30,
67.6,16:41:40,
67.6,16:41:50,
67.7,16:42:00,
67.8,16:42:10,
67.8,16:42:20,
67.8,16:42:30,
67.8,16:42:40,
67.8,16:42:50,
67.8,16:43:00,
67.8,16:43:10,
67.9,16:43:20,
67.8,16:43:30,
67.8,16:43:40,
67.8,16:43:50,

67.8,16:44:00,
67.8,16:44:10,
67.8,16:44:20,
67.8,16:44:30,
67.7,16:44:40,
67.8,16:44:50,
67.8,16:45:00,
67.7,16:45:10,
67.7,16:45:20,
67.7,16:45:30,
67.6,16:45:40,
67.6,16:45:50,
67.6,16:46:00,
67.6,16:46:10,
67.6,16:46:20,
67.7,16:46:30,
67.6,16:46:40,
67.6,16:46:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	69.0	68.7	68.7	68.4	68.3	68.3	68.3	68.2	68.2
L(10)	68.1	68.1	68.1	68.1	67.9	67.9	67.9	67.9	67.9
L(20)	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
L(30)	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
L(40)	67.8	67.8	67.8	67.8	67.8	67.8	67.7	67.7	67.7
L(50)	67.7	67.7	67.7	67.7	67.7	67.7	67.7	67.7	67.7
L(60)	67.7	67.7	67.7	67.7	67.7	67.7	67.7	67.6	67.6
L(70)	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6
L(80)	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6
L(90)	67.6	67.6	67.6	67.5	67.5	67.5	67.0	66.0	66.0

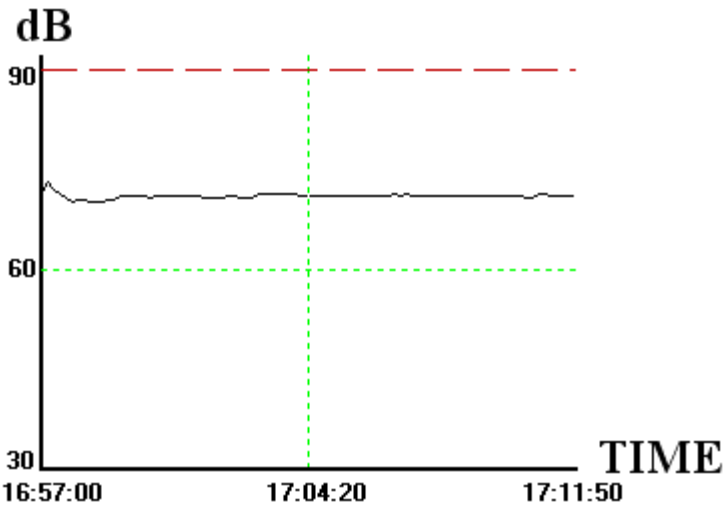

dB
90
60
30
TIME
16:32:00
16:39:20
16:46:50

Measurement 8

Date Time=04/06/16 16:57:00
Sampling Time=10
Record Num= 90
Leq Value=71.1 SEL Value=100.7
MAX Value=89.4
MIN Value=50.9
Freq Weighting=A Time Weighting=Fast
71.7,16:57:00,
73.0,16:57:10,
71.8,16:57:20,
71.4,16:57:30,
70.6,16:57:40,
70.1,16:57:50,
70.4,16:58:00,
70.3,16:58:10,
70.1,16:58:20,
70.0,16:58:30,
70.1,16:58:40,
70.5,16:58:50,
70.5,16:59:00,
71.0,16:59:10,
71.0,16:59:20,
70.9,16:59:30,
71.0,16:59:40,
70.9,16:59:50,
70.8,17:00:00,
71.1,17:00:10,
71.1,17:00:20,
71.0,17:00:30,
71.0,17:00:40,
70.9,17:00:50,
71.0,17:01:00,
71.0,17:01:10,
70.9,17:01:20,
70.8,17:01:30,
70.8,17:01:40,
70.8,17:01:50,
70.8,17:02:00,
70.9,17:02:10,
70.9,17:02:20,
70.8,17:02:30,
70.8,17:02:40,
70.7,17:02:50,
71.3,17:03:00,
71.4,17:03:10,
71.4,17:03:20,
71.3,17:03:30,
71.3,17:03:40,
71.2,17:03:50,
71.2,17:04:00,
71.1,17:04:10,
71.1,17:04:20,
71.0,17:04:30,
71.1,17:04:40,
71.0,17:04:50,
71.0,17:05:00,
71.0,17:05:10,
71.0,17:05:20,
71.1,17:05:30,
71.1,17:05:40,
71.1,17:05:50,
71.1,17:06:00,
71.1,17:06:10,
71.1,17:06:20,
71.1,17:06:30,
71.1,17:06:40,
71.2,17:06:50,
71.1,17:07:00,
71.2,17:07:10,
71.1,17:07:20,
71.1,17:07:30,
71.1,17:07:40,
71.0,17:07:50,
71.0,17:08:00,
71.0,17:08:10,
71.0,17:08:20,
70.9,17:08:30,
71.0,17:08:40,
71.1,17:08:50,

71.0,17:09:00,
71.1,17:09:10,
71.0,17:09:20,
71.0,17:09:30,
70.9,17:09:40,
70.9,17:09:50,
70.9,17:10:00,
70.9,17:10:10,
70.9,17:10:20,
70.8,17:10:30,
70.8,17:10:40,
71.2,17:10:50,
71.2,17:11:00,
71.1,17:11:10,
71.1,17:11:20,
71.1,17:11:30,
71.1,17:11:40,
71.1,17:11:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	73.0	71.8	71.7	71.4	71.4	71.4	71.3	71.3	71.3
L(10)	71.2	71.2	71.2	71.2	71.2	71.2	71.1	71.1	71.1
L(20)	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
L(30)	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
L(40)	71.1	71.1	71.0	71.0	71.0	71.0	71.0	71.0	71.0
L(50)	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0
L(60)	71.0	71.0	71.0	71.0	70.9	70.9	70.9	70.9	70.9
L(70)	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.8
L(80)	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.7
L(90)	70.5	70.5	70.4	70.3	70.1	70.1	70.1	70.0	70.0

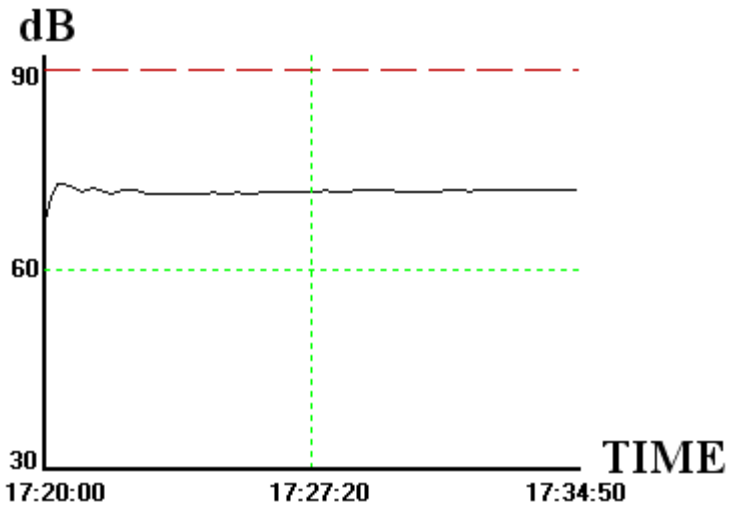

dB
90
60
30
TIME
16:57:00
17:04:20
17:11:50

Measurement 9

Date Time=04/06/16 17:20:00
Sampling Time=10
Record Num= 90
Leq Value=72.0   SEL Value=101.5
MAX Value=83.1
MIN Value=45.6
Freq Weighting=A   Time Weighting=Fast
67.2,17:20:00,
70.7,17:20:10,
72.8,17:20:20,
72.8,17:20:30,
72.5,17:20:40,
72.1,17:20:50,
71.5,17:21:00,
71.8,17:21:10,
72.1,17:21:20,
71.8,17:21:30,
71.6,17:21:40,
71.3,17:21:50,
71.7,17:22:00,
71.9,17:22:10,
71.9,17:22:20,
71.8,17:22:30,
71.6,17:22:40,
71.4,17:22:50,
71.2,17:23:00,
71.3,17:23:10,
71.4,17:23:20,
71.3,17:23:30,
71.4,17:23:40,
71.3,17:23:50,
71.3,17:24:00,
71.4,17:24:10,
71.4,17:24:20,
71.3,17:24:30,
71.5,17:24:40,
71.4,17:24:50,
71.4,17:25:00,
71.3,17:25:10,
71.5,17:25:20,
71.4,17:25:30,
71.4,17:25:40,
71.3,17:25:50,
71.6,17:26:00,
71.5,17:26:10,
71.5,17:26:20,
71.6,17:26:30,
71.7,17:26:40,
71.6,17:26:50,
71.5,17:27:00,
71.5,17:27:10,
71.6,17:27:20,
71.6,17:27:30,
71.7,17:27:40,
71.8,17:27:50,
71.7,17:28:00,
71.7,17:28:10,
71.6,17:28:20,
71.6,17:28:30,
71.9,17:28:40,
72.0,17:28:50,
71.9,17:29:00,
71.9,17:29:10,
71.8,17:29:20,
71.8,17:29:30,
71.8,17:29:40,
71.7,17:29:50,
71.7,17:30:00,
71.7,17:30:10,
71.7,17:30:20,
71.7,17:30:30,
71.7,17:30:40,
71.6,17:30:50,
71.7,17:31:00,
71.8,17:31:10,
71.8,17:31:20,
71.8,17:31:30,
71.8,17:31:40,
71.7,17:31:50,

71.8,17:32:00,
71.9,17:32:10,
71.8,17:32:20,
71.9,17:32:30,
71.9,17:32:40,
71.8,17:32:50,
71.8,17:33:00,
71.8,17:33:10,
71.8,17:33:20,
71.9,17:33:30,
71.9,17:33:40,
72.0,17:33:50,
72.0,17:34:00,
72.0,17:34:10,
71.9,17:34:20,
71.9,17:34:30,
72.0,17:34:40,
72.0,17:34:50,

Ln	1	2	3	4	5	6	7	8	9
L(00)	72.8	72.8	72.5	72.1	72.1	72.0	72.0	72.0	72.0
L(10)	72.0	72.0	71.9	71.9	71.9	71.9	71.9	71.9	71.9
L(20)	71.9	71.9	71.9	71.9	71.9	71.8	71.8	71.8	71.8
L(30)	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8
L(40)	71.8	71.8	71.8	71.8	71.7	71.7	71.7	71.7	71.7
L(50)	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.6
L(60)	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6
L(70)	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.4	71.4
L(80)	71.4	71.4	71.4	71.4	71.4	71.4	71.3	71.3	71.3
L(90)	71.3	71.3	71.3	71.3	71.3	71.2	70.7	67.2	67.2


dB
90
60
30
TIME
17:20:00
17:27:20
17:34:50

Environmental Review Main (/programs/environmental-review/)

DNL Calculator

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the Day/Night Noise Level Calculator Electronic Assessment Tool Overview (https://onecpd.info/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/).

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	Morro Bay
Record Date	05/13/2016
User's Name	Rincon Consultants, Inc.

Road # 1 Name: **Embarcadero - North of Beach Street**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	30	30	30
Average Daily Trips (ADT)	5018	158	106

Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	60	45	65
Calculate Road #1 DNL	66.2	Reset	

Road # 2 Name: **Embarcadero - North of Pacific Street**

Road #2

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	30	30	30
Average Daily Trips (ADT)	2537	80	53
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	57	42	62
Calculate Road #2 DNL	63.2	Reset	

Road # 3 Name: **Embarcadero - South of Pacific Street**

Road #3

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	30	30	30
Average Daily Trips (ADT)	2121	67	45
	15	15	15

Night Fraction of ADT

Road Gradient (%)			2
Vehicle DNL	56.2	41.2	61.3
Calculate Road #3 DNL	62.5	Reset	

Road # 4 Name: **Morro Bay Boulevard - West of Quintana Road**

Road #4

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	30	30	30
Average Daily Trips (ADT)	11270	356	237
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	63.5	48.5	68.5
Calculate Road #4 DNL	69.7	Reset	

Road # 5 Name: **Main Street - South of Radcliff Drive**

Road #5

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	8459	267	178

Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	60.7	45.7	67.2
Calculate Road #5 DNL	68.1	Reset	

Road # 6 Name: State Route 41 - East of Main Street

Road #6

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	40	40	40
Average Daily Trips (ADT)	9862	311	208
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	65.4	50.4	67.9
Calculate Road #6 DNL	69.9	Reset	

Road # 7 Name: Highway 1 - South of State Route 41

Road #7

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	65	65	65
Average Daily Trips (ADT)	23085	729	486
Night Fraction of ADT	15	15	15

Road Gradient (%)			2
Vehicle DNL	73.3	58.3	73.9
Calculate Road #7 DNL	76.7	Reset	

Road # 8 Name: **Highway 1 - North of State Route 41**

Road #8

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	50	50	50
Distance to Stop Sign			
Average Speed	65	65	65
Average Daily Trips (ADT)	18620	588	392
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	72.4	57.4	72.9
Calculate Road #8 DNL	75.7	Reset	

Add Road Source | Add Rail Source

Airport Noise Level

Loud Impulse Sounds? ○Yes ◉No

Combined DNL for all Road and Rail sources **80.7**

Combined DNL including Airport **N/A**

Site DNL with Loud Impulse Sound

Calculate

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
    - Contact your Field or Regional Environmental Officer (https://www.onecpd.info/programs/environmental-review/hud-environmental-staff-contacts/)
    - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
    - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
    - Incorporate natural or man-made barriers. See *The Noise Guidebook (https://www.onecpd.info/resource/313/hud-noise-guidebook/)*
    - Construct noise barrier. See the Barrier Performance Module (https://onecpd.info/programs/environmental-review/bpm-calculator/)

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (https://www.onecpd.info/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (https://www.onecpd.info/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

Appendix D: Circulation Data

Appendix D: Circulation Technical Data

Appendix D1: LOS Thresholds

Level of Service Thresholds							
Signalized Intersections[1]		Stop Sign Controlled Intersections[2]		Two-Way Stop Sign Controlled[3]		Pedestrian, Bicycle, and Transit Modes[4]	
Control Delay (seconds/vehicle)	Level of Service	Control Delay (seconds/vehicle)	Level of Service	Control Delay (seconds/vehicle)	Level of Service	LOS Score	Level of Service
≤ 10	A	≤ 10	A	≤ 5	A	≤ 2.00	A
> 10 - 20	B	> 10 - 15	B	> 5 - 10	B	> 2.00-2.75	B
> 20 - 35	C	> 15 - 25	C	> 10 - 20	C	> 2.75-3.50	C
> 35 - 55	D	> 25 - 35	D	> 20 - 30	D	> 3.50-4.25	D
> 55 - 80	E	> 35 - 50	E	> 30 - 45	E	> 4.25-5.00	E
> 80	F	> 50	F	> 45	F	> 5.00	F

1. Source: Exhibit 18-4 of the 2010 *Highway Capacity Manual.*
2. Source: Exhibits 19-1 and 20-2 of the 2010 Highway Capacity Manual.
3. Source: Exhibits 19-2 of the 2010 Highway Capacity Manual.
4. Source: Exhibit 16-5 and 16-6 of the 2010 Highway Capacity Manual, assuming 60 ft^2/p for pedestrian mode.

Appendix D2: Traffic Counts

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

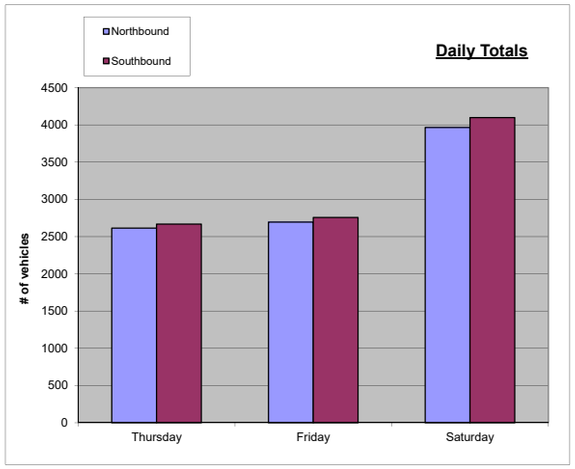
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Report Prepared For:

Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

3 Day Volume Count Report

Location No. 1
Road Name Embarcadero
Nearest Cross St North of Beach
Survey Date 3/17/16 thru 3/19/16
Latitude 35.369308°
Longitude -120.854688°
Peak Day Thursday
Number of Lanes 2
Comments

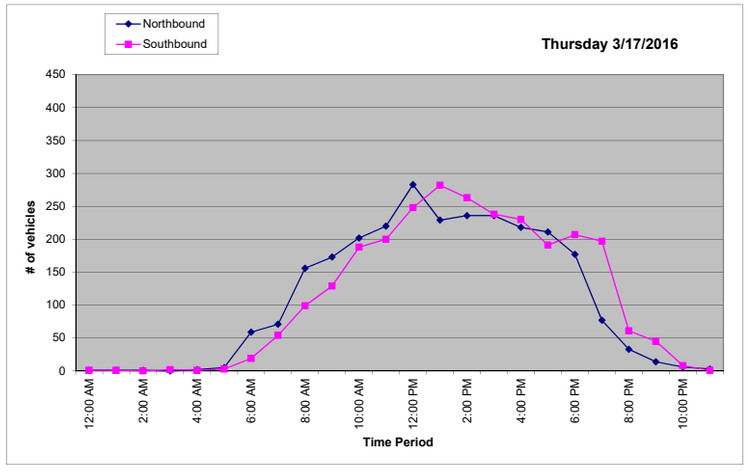


SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	2	1	13	16	5
1:00 AM	2	2	6	10	3
2:00 AM	1	2	2	5	2
3:00 AM	2	0	5	7	2
4:00 AM	3	6	10	19	6
5:00 AM	8	19	25	52	17
6:00 AM	78	88	112	278	93
7:00 AM	125	162	221	508	169
8:00 AM	255	247	352	854	285
9:00 AM	302	338	481	1121	374
10:00 AM	390	410	626	1426	475
11:00 AM	420	499	658	1577	526
12:00 PM	531	488	731	1750	583
1:00 PM	511	524	806	1841	614
2:00 PM	499	465	711	1675	558
3:00 PM	474	492	679	1645	548
4:00 PM	448	471	674	1593	531
5:00 PM	402	432	666	1500	500
6:00 PM	384	353	623	1360	453
7:00 PM	274	220	353	847	282
8:00 PM	94	122	125	341	114
9:00 PM	59	57	79	195	65
10:00 PM	14	27	39	80	27
11:00 PM	4	26	65	95	32
Total	5282	5451	8062	18795	6265
Percentages	28.10%	29.00%	42.89%	100.00%	33.33%

Thursday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	0	0	1	0	1	0	0	1	2
1:00 AM	0	0	1	0	1	0	0	1	0	1	2
2:00 AM	0	0	1	0	1	0	0	0	0	0	1
3:00 AM	0	0	0	0	0	1	0	0	1	2	2
4:00 AM	1	1	0	0	2	0	1	0	0	1	3
5:00 AM	1	0	1	3	5	0	0	1	2	3	8
6:00 AM	6	6	22	25	59	2	1	3	13	19	78
7:00 AM	16	23	19	13	71	7	14	17	16	54	125
8:00 AM	36	38	36	46	156	20	14	36	29	99	255
9:00 AM	31	38	50	54	173	29	21	31	48	129	302
10:00 AM	46	53	49	54	202	50	46	47	45	188	390
11:00 AM	58	67	38	57	220	55	45	46	54	200	420
12:00 PM	66	78	68	71	283	49	62	72	65	248	531
1:00 PM	68	52	50	59	229	73	64	73	72	282	511
2:00 PM	66	53	53	64	236	74	60	65	64	263	499
3:00 PM	61	62	49	64	236	68	69	51	50	238	474
4:00 PM	50	45	61	62	218	69	62	46	53	230	448
5:00 PM	55	57	53	46	211	48	50	55	38	191	402
6:00 PM	45	56	42	34	177	51	55	44	57	207	384
7:00 PM	27	21	19	10	77	53	66	50	28	197	274
8:00 PM	11	10	3	9	33	19	13	17	12	61	94
9:00 PM	7	4	2	1	14	22	7	10	6	45	59
10:00 PM	2	0	2	2	6	4	0	1	3	8	14
11:00 PM	0	1	2	0	3	0	0	1	0	1	4
12:00 AM	49.5%				2614	50.5%				2668	
	5282										

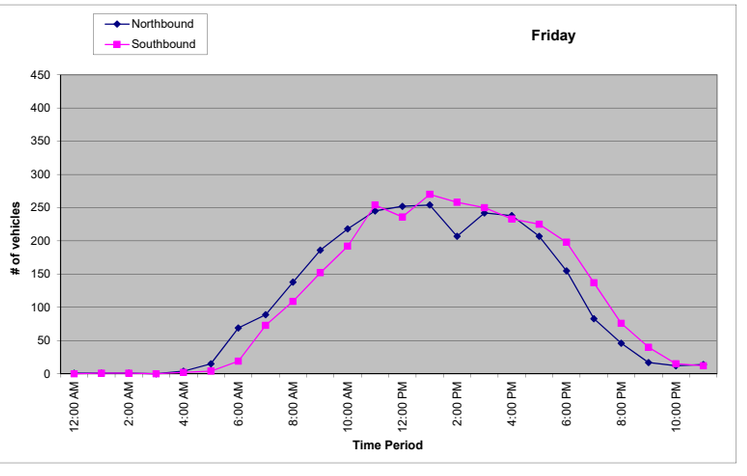
AM Peak Hr 11:00 am to 12:00 pm — AM Peak 420 — AM PHF 0.929204
PM Peak Hr 12:15 pm to 1:15 pm — PM Peak 557 — PM PHF 0.987589



Friday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	0	0	1	0	0	0	0	0	1
1:00 AM	0	0	1	0	1	0	0	0	1	1	2
2:00 AM	1	0	0	0	1	0	1	0	0	1	2
3:00 AM	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	1	3	0	4	0	1	1	0	2	6
5:00 AM	0	1	4	10	15	1	0	1	2	4	19
6:00 AM	10	20	17	22	69	2	6	6	5	19	88
7:00 AM	12	20	27	30	89	15	14	13	31	73	162
8:00 AM	36	19	47	36	138	15	33	20	41	109	247
9:00 AM	44	47	40	55	186	31	50	36	35	152	338
10:00 AM	48	53	54	63	218	36	34	67	55	192	410
11:00 AM	58	54	68	65	245	70	51	64	69	254	499
12:00 PM	77	55	60	60	252	45	62	57	72	236	488
1:00 PM	54	64	60	76	254	67	66	69	68	270	524
2:00 PM	51	54	58	44	207	70	60	67	61	258	465
3:00 PM	64	58	57	63	242	55	72	62	61	250	492
4:00 PM	69	57	60	52	238	80	58	52	43	233	471
5:00 PM	52	55	55	45	207	63	48	61	53	225	432
6:00 PM	42	42	37	34	155	48	56	48	46	198	353
7:00 PM	26	22	19	16	83	41	34	32	30	137	220
8:00 PM	11	13	16	6	46	31	14	19	12	76	122
9:00 PM	5	5	3	4	17	16	9	8	7	40	57
10:00 PM	6	3	2	1	12	6	6	1	2	15	27
11:00 PM	3	5	5	1	14	6	1	4	1	12	26
Total	49.4%				2694	50.6%				2757	
	5451										

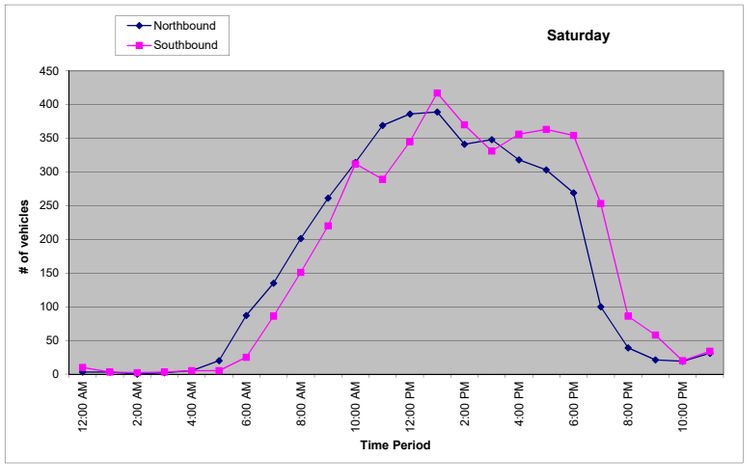
AM Peak Hr 11:00 am to 12:00 pm — AM Peak 499 — AM PHF 0.93097
PM Peak Hr 1:15 pm to 2:15 pm — PM Peak 524 — PM PHF 0.909722



Saturday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	1	1	0	3	3	3	3	1	10	13
1:00 AM	0	0	2	1	3	0	1	0	2	3	6
2:00 AM	0	0	0	0	0	0	0	1	1	2	2
3:00 AM	1	1	0	0	2	0	1	0	2	3	5
4:00 AM	1	2	0	2	5	1	0	1	3	5	10
5:00 AM	4	4	7	5	20	4	0	1	0	5	25
6:00 AM	12	19	26	30	87	3	11	3	8	25	112
7:00 AM	37	29	32	37	135	20	19	29	18	86	221
8:00 AM	46	36	69	50	201	33	33	32	53	151	352
9:00 AM	63	53	66	79	261	42	48	73	57	220	481
10:00 AM	71	79	92	72	314	84	87	76	65	312	626
11:00 AM	75	104	99	91	369	65	80	69	75	289	658
12:00 PM	109	91	92	94	386	72	76	102	95	345	731
1:00 PM	86	116	92	95	389	102	108	103	104	417	806
2:00 PM	94	85	83	79	341	78	95	106	91	370	711
3:00 PM	85	104	77	82	348	88	98	70	75	331	679
4:00 PM	75	76	86	81	318	84	94	81	97	356	674
5:00 PM	75	75	70	83	303	98	83	89	93	363	666
6:00 PM	94	64	67	44	269	77	95	86	96	354	623
7:00 PM	36	23	25	16	100	82	65	59	47	253	353
8:00 PM	9	12	11	7	39	33	22	18	13	86	125
9:00 PM	6	7	1	7	21	21	15	14	8	58	79
10:00 PM	2	10	3	4	19	7	4	6	3	20	39
11:00 PM	1	2	14	14	31	3	3	14	14	34	65
Total	49.2%				3964	50.8%				4098	
	8062										

AM Peak Hr 11:00 am to 12:00 pm — AM Peak 658 — AM PHF 0.894022
PM Peak Hr 1:00 pm to 2:00 pm — PM Peak 806 — PM PHF 0.899554



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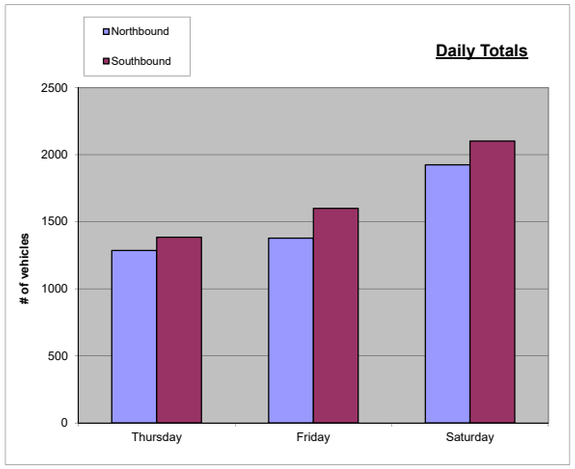
Report Prepared For:

Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

3 Day Volume Count Report

Location No. 2
Road Name Embarcadero
Nearest Cross St North of Pacific
Survey Date 3/17/16 thru 3/19/16
Latitude 35.365286°
Longitude -120.853058°
Peak Day Thursday
Number of Lanes 2
Comments



SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	7	7	9	23	8
1:00 AM	0	2	3	5	2
2:00 AM	2	3	5	10	3
3:00 AM	1	2	3	6	2
4:00 AM	2	4	5	11	4
5:00 AM	7	6	6	19	6
6:00 AM	23	22	24	69	23
7:00 AM	58	53	50	161	54
8:00 AM	111	119	121	351	117
9:00 AM	139	161	202	502	167
10:00 AM	194	193	250	637	212
11:00 AM	205	212	291	708	236
12:00 PM	233	221	354	808	269
1:00 PM	220	228	425	873	291
2:00 PM	226	250	347	823	274
3:00 PM	212	240	301	753	251
4:00 PM	206	256	324	786	262
5:00 PM	201	248	330	779	260
6:00 PM	235	222	324	781	260
7:00 PM	180	201	273	654	218
8:00 PM	82	154	162	398	133
9:00 PM	71	86	115	272	91
10:00 PM	42	60	67	169	56
11:00 PM	13	28	36	77	26
Total	2670	2978	4027	9675	3225
Percentages	27.60%	30.78%	41.62%	100.00%	33.33%

Thursday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	0	0	0	1	1	1	2	2	1	6	7
1:00 AM	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	1	0	2	0	0	0	0	0	2
3:00 AM	0	1	0	0	1	0	0	0	0	0	1
4:00 AM	1	0	1	0	2	0	0	0	0	0	2
5:00 AM	1	0	1	1	3	1	0	3	0	4	7
6:00 AM	2	2	6	5	15	1	3	0	4	8	23
7:00 AM	7	7	9	8	31	4	6	9	8	27	58
8:00 AM	13	12	19	11	55	16	12	13	15	56	111
9:00 AM	15	21	22	21	79	12	14	10	24	60	139
10:00 AM	17	21	26	28	92	22	22	29	29	102	194
11:00 AM	28	22	22	23	95	33	30	23	24	110	205
12:00 PM	28	31	24	37	120	14	32	37	30	113	233
1:00 PM	28	23	17	23	91	36	35	32	26	129	220
2:00 PM	27	37	25	29	118	33	42	13	20	108	226
3:00 PM	17	33	23	24	97	28	37	26	24	115	212
4:00 PM	25	35	18	28	106	20	39	19	22	100	206
5:00 PM	37	21	20	26	104	26	22	21	28	97	201
6:00 PM	28	29	33	25	115	30	27	28	35	120	235
7:00 PM	16	30	14	18	78	30	34	18	20	102	180
8:00 PM	15	12	4	7	38	9	10	14	11	44	82
9:00 PM	5	7	10	5	27	14	8	12	10	44	71
10:00 PM	4	3	3	3	13	6	7	7	9	29	42
11:00 PM	2	1	0	0	3	1	2	3	4	10	13
12:00 AM	48.2%				1286	51.8%				1384	
	2670										

AM Peak Hr 10:30 am to 11:30 am — AM Peak 225 — AM PHF 0.922131
PM Peak Hr 6:00 pm to 7:00 pm — PM Peak 235 — PM PHF 0.963115

Friday

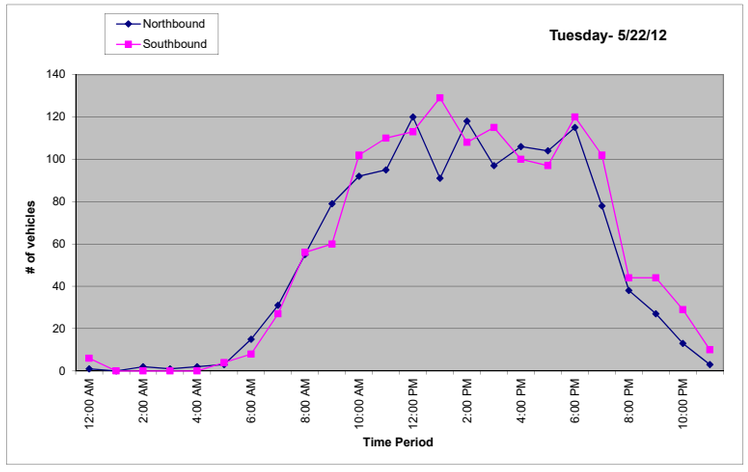
	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	0	0	1	0	3	3	0	6	7
1:00 AM	0	0	0	0	0	1	1	0	0	2	2
2:00 AM	1	0	0	0	1	1	0	1	0	2	3
3:00 AM	1	0	0	0	1	1	0	0	0	1	2
4:00 AM	0	0	1	2	3	0	0	1	0	1	4
5:00 AM	1	1	1	1	4	0	0	1	1	2	6
6:00 AM	4	0	4	9	17	0	0	1	4	5	22
7:00 AM	4	4	3	13	24	8	3	9	9	29	53
8:00 AM	11	14	12	33	70	9	10	15	15	49	119
9:00 AM	22	20	15	30	87	17	17	19	21	74	161
10:00 AM	25	15	22	26	88	22	30	17	36	105	193
11:00 AM	18	29	28	29	104	27	33	26	22	108	212
12:00 PM	30	16	31	21	98	33	28	33	29	123	221
1:00 PM	21	18	29	30	98	35	30	35	30	130	228
2:00 PM	35	22	30	26	113	39	36	28	34	137	250
3:00 PM	23	30	23	32	108	32	37	31	32	132	240
4:00 PM	24	20	36	36	116	41	28	38	33	140	256
5:00 PM	33	26	32	33	124	35	31	30	28	124	248
6:00 PM	22	22	30	23	97	31	36	30	28	125	222
7:00 PM	26	19	32	18	95	31	23	27	25	106	201
8:00 PM	24	17	12	16	69	21	23	13	28	85	154
9:00 PM	10	8	10	7	35	16	15	8	12	51	86
10:00 PM	4	4	4	5	17	16	12	9	6	43	60
11:00 PM	3	2	2	1	8	5	6	7	2	20	28
Total	46.3%				1378	53.7%				1600	
	2978										

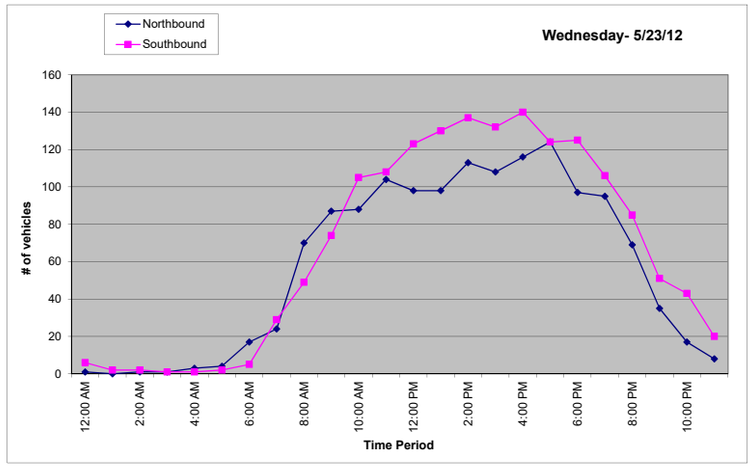
AM Peak Hr 10:45 am to 11:45 am — AM Peak 223 — AM PHF 0.899194
PM Peak Hr 4:30 pm to 5:30 pm — PM Peak 268 — PM PHF 0.905405

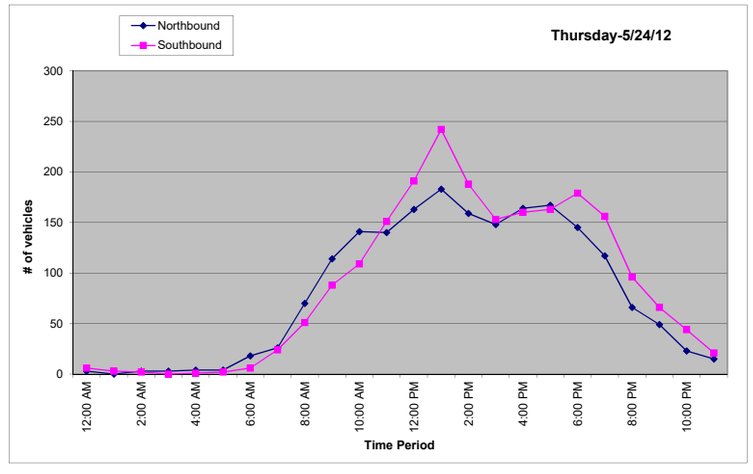
Saturday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	0	2	0	1	3	4	1	1	0	6	9
1:00 AM	0	0	0	0	0	1	0	0	2	3	3
2:00 AM	2	0	0	1	3	1	0	1	0	2	5
3:00 AM	0	0	1	2	3	0	0	0	0	0	3
4:00 AM	2	1	1	0	4	0	0	1	0	1	5
5:00 AM	2	0	0	2	4	0	0	0	2	2	6
6:00 AM	2	3	4	9	18	1	1	2	2	6	24
7:00 AM	4	7	5	10	26	3	6	5	10	24	50
8:00 AM	16	19	16	19	70	8	11	15	17	51	121
9:00 AM	28	22	34	30	114	20	17	24	27	88	202
10:00 AM	32	47	29	33	141	35	20	30	24	109	250
11:00 AM	39	28	40	33	140	44	38	34	35	151	291
12:00 PM	30	40	42	51	163	56	39	52	44	191	354
1:00 PM	50	45	44	44	183	58	71	63	50	242	425
2:00 PM	42	50	34	33	159	48	48	48	44	188	347
3:00 PM	34	31	41	42	148	46	35	32	40	153	301
4:00 PM	45	43	30	46	164	41	35	33	51	160	324
5:00 PM	38	46	41	42	167	37	51	38	37	163	330
6:00 PM	31	43	36	35	145	35	50	38	56	179	324
7:00 PM	40	26	24	27	117	37	47	36	36	156	273
8:00 PM	16	23	17	10	66	27	29	19	21	96	162
9:00 PM	11	17	12	9	49	13	16	18	19	66	115
10:00 PM	10	6	2	5	23	14	10	11	9	44	67
11:00 PM	4	6	1	4	15	10	3	4	4	21	36
Total	47.8%				1925	52.2%				2102	
	4027										

AM Peak Hr 11:00 am to 12:00 pm — AM Peak 291 — AM PHF 0.876506
PM Peak Hr 0:45 pm to 1:45 pm — PM Peak 426 — PM PHF 0.918103







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Report Prepared For:

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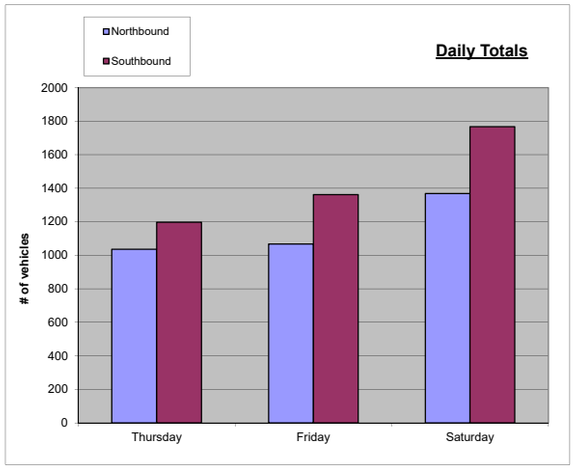
3 Day Volume Count Report

Location No. 3
Road Name Embarcadero
Nearest Cross St South of Pacific
Survey Date 3/17/16 thru 3/19/16
Latitude 35.364623°
Longitude -120.852858°
Peak Day Thursday
Number of Lanes 2
Comments

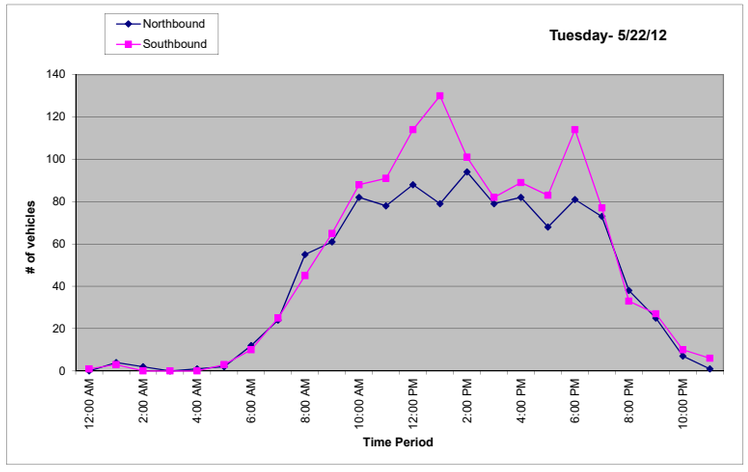


SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	1	7	7	**15**	**5**
1:00 AM	7	1	1	**9**	**3**
2:00 AM	2	4	4	**10**	**3**
3:00 AM	0	2	1	**3**	**1**
4:00 AM	1	2	4	**7**	**2**
5:00 AM	5	5	4	**14**	**5**
6:00 AM	22	23	22	**67**	**22**
7:00 AM	49	47	65	**161**	**54**
8:00 AM	100	103	108	**311**	**104**
9:00 AM	126	136	158	**420**	**140**
10:00 AM	170	149	213	**532**	**177**
11:00 AM	169	176	235	**580**	**193**
12:00 PM	202	206	241	**649**	**216**
1:00 PM	209	192	323	**724**	**241**
2:00 PM	195	197	269	**661**	**220**
3:00 PM	161	199	249	**609**	**203**
4:00 PM	171	185	247	**603**	**201**
5:00 PM	151	190	274	**615**	**205**
6:00 PM	195	210	238	**643**	**214**
7:00 PM	150	165	197	**512**	**171**
8:00 PM	71	109	125	**305**	**102**
9:00 PM	52	55	79	**186**	**62**
10:00 PM	17	41	38	**96**	**32**
11:00 PM	7	25	33	**65**	**22**
Total	**2233**	**2429**	**3135**	**7797**	**2599**
Percentages	**28.64%**	**31.15%**	**40.21%**	**100.00%**	**33.33%**

Thursday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	0	0	0	0	**0**	1	0	0	0	**1**	**1**
1:00 AM	4	0	0	0	**4**	3	0	0	0	**3**	**7**
2:00 AM	0	1	1	0	**2**	0	0	0	0	**0**	**2**
3:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
4:00 AM	0	0	0	1	**1**	0	0	0	0	**0**	**1**
5:00 AM	1	0	0	1	**2**	0	0	2	1	**3**	**5**
6:00 AM	2	4	3	3	**12**	3	2	2	3	**10**	**22**
7:00 AM	6	6	6	6	**24**	3	6	8	8	**25**	**49**
8:00 AM	10	9	21	15	**55**	7	13	9	16	**45**	**100**
9:00 AM	10	18	15	18	**61**	11	15	15	24	**65**	**126**
10:00 AM	19	23	22	18	**82**	17	18	28	25	**88**	**170**
11:00 AM	18	27	14	19	**78**	25	26	17	23	**91**	**169**
12:00 PM	21	21	17	29	**88**	26	26	39	23	**114**	**202**
1:00 PM	23	20	11	25	**79**	39	38	30	23	**130**	**209**
2:00 PM	23	23	23	25	**94**	24	34	26	17	**101**	**195**
3:00 PM	15	21	21	22	**79**	17	32	17	16	**82**	**161**
4:00 PM	14	20	29	19	**82**	12	36	24	17	**89**	**171**
5:00 PM	20	17	12	19	**68**	23	23	10	27	**83**	**151**
6:00 PM	16	21	20	24	**81**	37	32	24	21	**114**	**195**
7:00 PM	19	23	14	17	**73**	22	25	11	19	**77**	**150**
8:00 PM	16	16	3	3	**38**	11	9	8	5	**33**	**71**
9:00 PM	9	8	6	2	**25**	9	7	5	6	**27**	**52**
10:00 PM	4	1	1	1	**7**	4	0	4	2	**10**	**17**
11:00 PM	1	0	0	0	**1**	3	2	0	1	**6**	**7**
12:00 AM	46.4%				**1036**	53.6%				**1197**	
	2233										

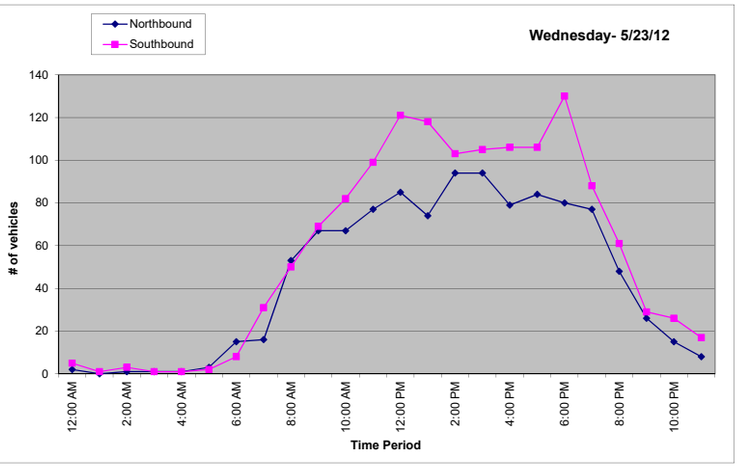
AM Peak Hr 10:30 am to 11:30 am — AM Peak 189 — AM PHF 0.891509
PM Peak Hr 0:30 pm to 1:30 pm — PM Peak 228 — PM PHF 0.919355



Friday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	0	1	0	1	**2**	0	2	2	1	**5**	**7**
1:00 AM	0	0	0	0	**0**	0	1	0	0	**1**	**1**
2:00 AM	1	0	0	0	**1**	1	1	1	0	**3**	**4**
3:00 AM	1	0	0	0	**1**	1	0	0	0	**1**	**2**
4:00 AM	0	0	0	1	**1**	0	0	1	0	**1**	**2**
5:00 AM	0	1	1	1	**3**	0	0	1	1	**2**	**5**
6:00 AM	2	1	5	7	**15**	0	1	2	5	**8**	**23**
7:00 AM	1	5	3	7	**16**	8	3	7	13	**31**	**47**
8:00 AM	12	11	12	18	**53**	11	12	13	14	**50**	**103**
9:00 AM	17	17	11	22	**67**	17	17	15	20	**69**	**136**
10:00 AM	14	13	18	22	**67**	25	16	23	18	**82**	**149**
11:00 AM	19	21	20	17	**77**	23	18	28	30	**99**	**176**
12:00 PM	24	20	23	18	**85**	33	24	36	28	**121**	**206**
1:00 PM	19	12	26	17	**74**	31	32	29	26	**118**	**192**
2:00 PM	26	23	22	23	**94**	38	29	14	22	**103**	**197**
3:00 PM	28	25	13	28	**94**	23	30	23	29	**105**	**199**
4:00 PM	12	16	23	28	**79**	24	26	26	30	**106**	**185**
5:00 PM	23	16	20	25	**84**	28	23	27	28	**106**	**190**
6:00 PM	15	27	21	17	**80**	37	33	29	31	**130**	**210**
7:00 PM	27	11	26	13	**77**	22	19	24	23	**88**	**165**
8:00 PM	15	11	10	12	**48**	12	22	10	17	**61**	**109**
9:00 PM	8	6	6	6	**26**	12	8	4	5	**29**	**55**
10:00 PM	3	3	3	6	**15**	6	5	7	8	**26**	**41**
11:00 PM	4	2	1	1	**8**	5	5	2	5	**17**	**25**
Total	43.9%				**1067**	56.1%				**1362**	
	2429										

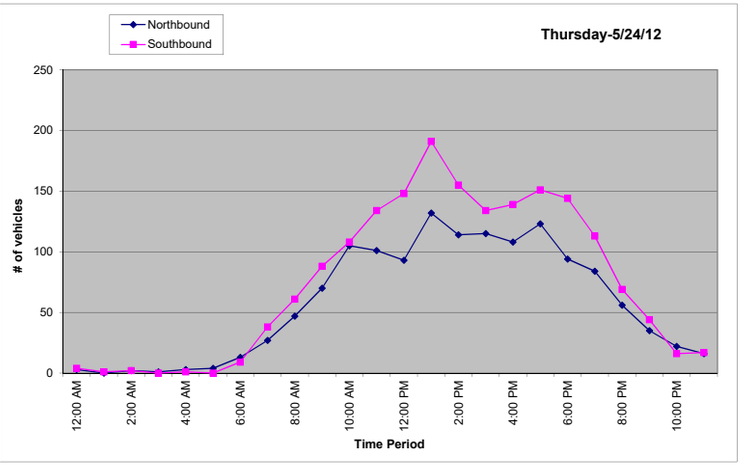
AM Peak Hr 11:00 am to 12:00 pm — AM Peak 176 — AM PHF 0.916667
PM Peak Hr 5:45 pm to 6:45 pm — PM Peak 215 — PM PHF 0.895833



Saturday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	2	0	0	1	**3**	2	0	2	0	**4**	**7**
1:00 AM	0	0	0	0	**0**	1	0	0	0	**1**	**1**
2:00 AM	1	0	0	1	**2**	1	0	1	0	**2**	**4**
3:00 AM	0	0	0	1	**1**	0	0	0	0	**0**	**1**
4:00 AM	0	1	2	0	**3**	0	0	1	0	**1**	**4**
5:00 AM	1	1	0	2	**4**	0	0	0	0	**0**	**4**
6:00 AM	2	2	3	6	**13**	1	3	2	3	**9**	**22**
7:00 AM	4	6	5	12	**27**	9	9	7	13	**38**	**65**
8:00 AM	11	9	13	14	**47**	13	12	14	22	**61**	**108**
9:00 AM	16	15	23	16	**70**	15	18	28	27	**88**	**158**
10:00 AM	27	26	24	28	**105**	30	29	27	22	**108**	**213**
11:00 AM	25	18	28	30	**101**	37	30	39	28	**134**	**235**
12:00 PM	19	28	21	25	**93**	44	37	41	26	**148**	**241**
1:00 PM	36	41	31	24	**132**	42	51	53	45	**191**	**323**
2:00 PM	28	35	28	23	**114**	31	58	46	20	**155**	**269**
3:00 PM	24	26	31	34	**115**	41	38	27	28	**134**	**249**
4:00 PM	31	29	23	25	**108**	37	35	27	40	**139**	**247**
5:00 PM	30	33	35	25	**123**	31	51	38	31	**151**	**274**
6:00 PM	18	25	28	23	**94**	30	43	33	38	**144**	**238**
7:00 PM	29	23	16	16	**84**	36	34	25	18	**113**	**197**
8:00 PM	17	17	15	7	**56**	22	15	18	14	**69**	**125**
9:00 PM	13	13	6	3	**35**	10	15	11	8	**44**	**79**
10:00 PM	7	6	1	8	**22**	3	5	2	6	**16**	**38**
11:00 PM	4	7	0	5	**16**	4	8	3	2	**17**	**33**
Total	43.6%				**1368**	56.4%				**1767**	
	3135										

AM Peak Hr 11:00 am to 12:00 pm — AM Peak 235 — AM PHF 0.876866
PM Peak Hr 1:00 pm to 2:00 pm — PM Peak 323 — PM PHF 0.877717



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

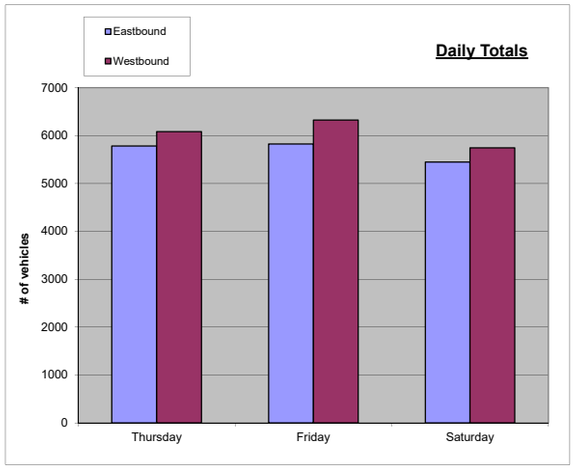
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Report Prepared For:

Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

3 Day Volume Count Report

Location No. 4
Road Name Morro Bay Boulevard
Nearest Cross St West of Quintana
Survey Date 3/17/16 thru 3/19/16
Latitude 35.366221°
Longitude -120.841508°
Peak Day Wednesday
Number of Lanes 2
Comments



SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	32	37	31	100	33
1:00 AM	12	9	19	40	13
2:00 AM	12	8	12	32	11
3:00 AM	15	13	21	49	16
4:00 AM	30	34	32	96	32
5:00 AM	70	93	71	234	78
6:00 AM	226	287	168	681	227
7:00 AM	541	600	353	1494	498
8:00 AM	721	738	586	2045	682
9:00 AM	742	757	784	2283	761
10:00 AM	863	899	807	2569	856
11:00 AM	852	886	904	2642	881
12:00 PM	943	968	972	2883	961
1:00 PM	882	912	993	2787	929
2:00 PM	938	1039	902	2879	960
3:00 PM	1006	1073	928	3007	1002
4:00 PM	1000	998	963	2961	987
5:00 PM	953	917	702	2572	857
6:00 PM	661	619	617	1897	632
7:00 PM	479	444	457	1380	460
8:00 PM	373	298	359	1030	343
9:00 PM	275	262	253	790	263
10:00 PM	160	175	158	493	164
11:00 PM	78	81	99	258	86
Total	11864	12147	11191	35202	11734
Percentages	33.70%	34.51%	31.79%	100.00%	33.33%

Thursday

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	2	4	8	4	18	5	3	5	1	14	32
1:00 AM	3	1	0	1	5	0	1	6	0	7	12
2:00 AM	1	1	1	1	4	2	4	2	0	8	12
3:00 AM	5	4	1	0	10	2	1	0	2	5	15
4:00 AM	7	7	5	5	24	0	2	2	2	6	30
5:00 AM	11	13	9	17	50	1	5	7	7	20	70
6:00 AM	20	22	53	55	150	14	8	26	28	76	226
7:00 AM	54	83	83	111	331	34	56	44	76	210	541
8:00 AM	108	92	97	60	357	67	109	90	98	364	721
9:00 AM	91	93	96	93	373	90	85	95	99	369	742
10:00 AM	114	114	113	100	441	103	112	106	101	422	863
11:00 AM	89	94	89	125	397	108	97	112	138	455	852
12:00 PM	108	104	119	115	446	124	113	130	130	497	943
1:00 PM	113	109	120	111	453	114	112	103	100	429	882
2:00 PM	112	103	117	122	454	117	120	108	139	484	938
3:00 PM	115	111	109	121	456	134	155	118	143	550	1006
4:00 PM	104	85	131	121	441	137	146	140	136	559	1000
5:00 PM	130	103	109	69	411	146	135	139	122	542	953
6:00 PM	85	70	72	69	296	105	87	87	86	365	661
7:00 PM	72	54	62	43	231	71	72	57	48	248	479
8:00 PM	46	51	49	41	187	57	35	51	43	186	373
9:00 PM	52	43	29	26	150	28	38	31	28	125	275
10:00 PM	15	22	16	9	62	26	23	24	25	98	160
11:00 PM	15	10	4	6	35	17	9	9	8	43	78
12:00 AM	48.7%				5782	51.3%				6082	
	11864										

AM Peak Hr 10:00 am to 11:00 am — AM Peak 863 — AM PHF 0.954646
PM Peak Hr 3:45 pm to 4:45 pm — PM Peak 1007 — PM PHF 0.928967

Friday

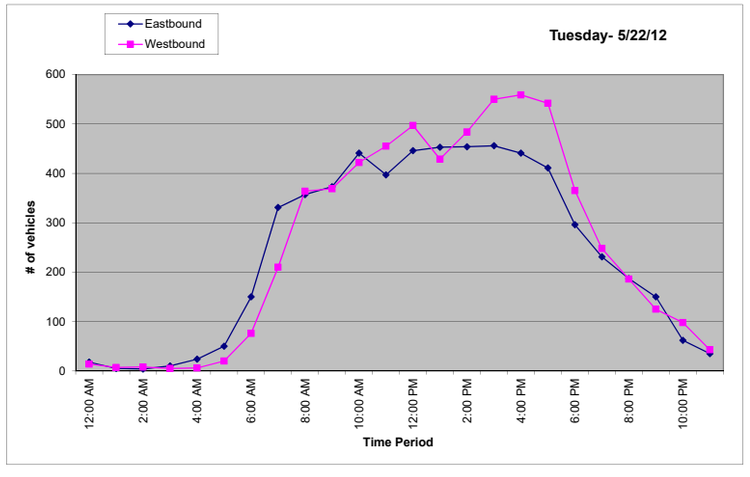
	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	6	4	2	7	19	5	9	2	2	18	37
1:00 AM	4	1	1	0	6	1	0	1	1	3	9
2:00 AM	3	0	0	0	3	3	1	1	0	5	8
3:00 AM	2	3	0	3	8	1	2	2	0	5	13
4:00 AM	5	5	4	11	25	2	1	5	1	9	34
5:00 AM	14	18	16	15	63	4	9	6	11	30	93
6:00 AM	24	41	47	58	170	21	14	47	35	117	287
7:00 AM	75	80	95	106	356	59	46	67	72	244	600
8:00 AM	94	81	77	98	350	89	89	114	96	388	738
9:00 AM	109	84	77	102	372	86	83	109	107	385	757
10:00 AM	111	105	96	119	431	111	105	135	117	468	899
11:00 AM	93	90	101	114	398	94	119	137	138	488	886
12:00 PM	100	107	128	111	446	123	138	136	125	522	968
1:00 PM	99	95	110	116	420	104	130	135	123	492	912
2:00 PM	126	136	127	126	515	113	146	125	140	524	1039
3:00 PM	112	121	123	117	473	138	145	150	167	600	1073
4:00 PM	113	105	105	136	459	142	132	134	131	539	998
5:00 PM	116	113	94	100	423	144	147	100	103	494	917
6:00 PM	77	61	75	68	281	83	100	84	71	338	619
7:00 PM	53	53	58	44	208	69	68	46	53	236	444
8:00 PM	38	46	32	37	153	43	38	27	37	145	298
9:00 PM	29	26	38	35	128	33	36	27	38	134	262
10:00 PM	30	16	25	15	86	24	29	19	17	89	175
11:00 PM	9	11	3	7	30	21	11	11	8	51	81
Total	47.9%				5823	52.1%				6324	
	12147										

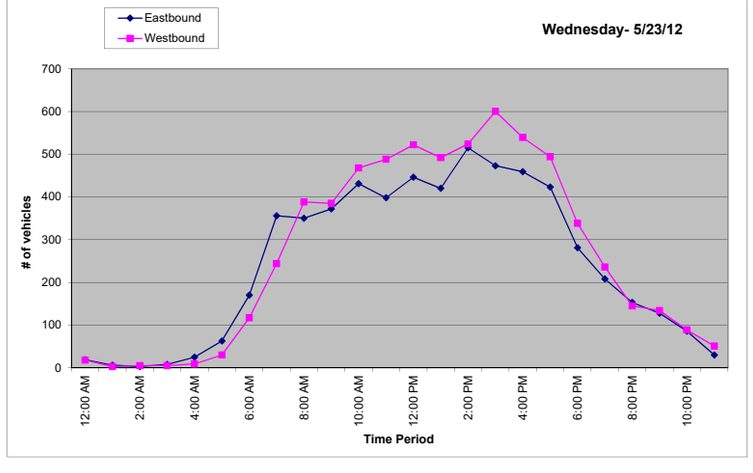
AM Peak Hr 10:00 am to 11:00 am — AM Peak 899 — AM PHF 0.952331
PM Peak Hr 3:15 pm to 4:15 pm — PM Peak 1078 — PM PHF 0.948944

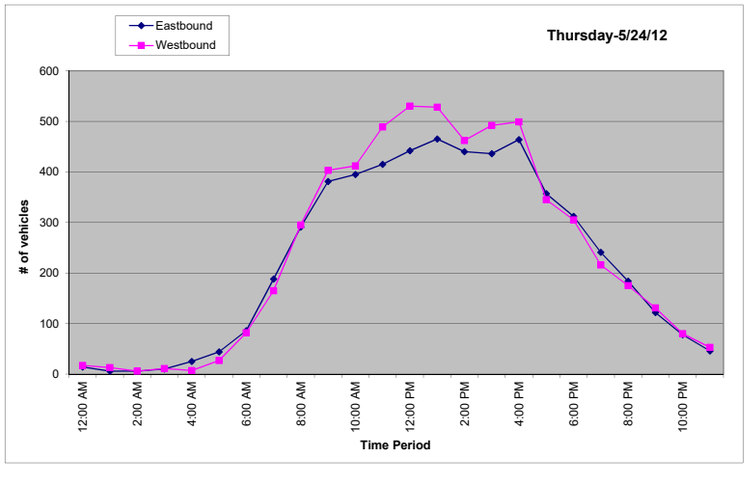
Saturday

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	3	4	5	2	14	6	3	2	6	17	31
1:00 AM	5	0	1	0	6	3	4	4	2	13	19
2:00 AM	0	1	1	4	6	0	1	1	4	6	12
3:00 AM	4	1	2	3	10	3	2	3	3	11	21
4:00 AM	5	6	5	9	25	1	1	2	3	7	32
5:00 AM	11	13	7	13	44	5	6	7	9	27	71
6:00 AM	18	18	19	31	86	12	18	21	31	82	168
7:00 AM	41	42	61	44	188	33	32	55	45	165	353
8:00 AM	67	71	84	69	291	52	82	84	77	295	586
9:00 AM	92	93	96	100	381	82	104	119	98	403	784
10:00 AM	96	100	105	94	395	95	121	83	113	412	807
11:00 AM	114	80	106	115	415	105	134	134	116	489	904
12:00 PM	109	105	109	119	442	127	137	133	133	530	972
1:00 PM	124	98	141	102	465	132	124	138	134	528	993
2:00 PM	104	102	123	111	440	104	123	111	124	462	902
3:00 PM	109	111	107	109	436	138	124	123	107	492	928
4:00 PM	116	133	116	99	464	146	143	97	113	499	963
5:00 PM	90	88	85	94	357	86	80	88	91	345	702
6:00 PM	97	76	65	74	312	85	86	65	69	305	617
7:00 PM	75	59	54	53	241	62	62	48	44	216	457
8:00 PM	41	58	38	47	184	49	46	40	40	175	359
9:00 PM	41	28	33	20	122	38	41	25	27	131	253
10:00 PM	25	20	17	16	78	24	21	13	22	80	158
11:00 PM	9	9	14	14	46	12	13	14	14	53	99
Total	48.7%				5448	51.3%				5743	
	11191										

AM Peak Hr 11:00 am to 12:00 pm — AM Peak 904 — AM PHF 0.941667
PM Peak Hr 0:45 pm to 1:45 pm — PM Peak 1009 — PM PHF 0.904122







Metro Traffic Data Inc.
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800-975-6938 Phone/Fax
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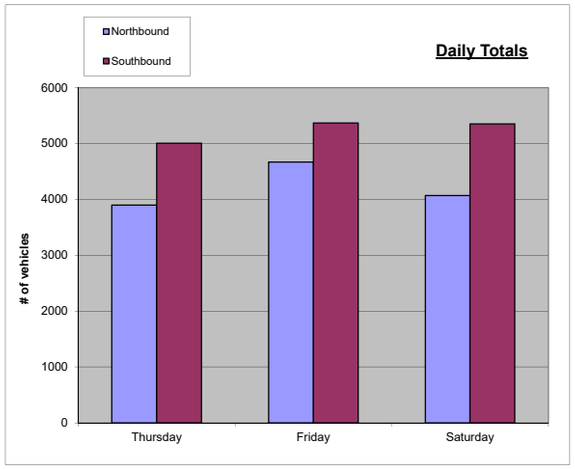
Report Prepared For:

Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

3 Day Volume Count Report

Location No. 5
Road Name Main Street
Nearest Cross St South of Radcliff
Survey Date 3/17/16 thru 3/19/16
Latitude 35.373754°
Longitude -120.851466°
Peak Day Wednesday
Number of Lanes 2
Comments



SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	16	10	14	**40**	**13**
1:00 AM	5	5	6	**16**	**5**
2:00 AM	9	2	8	**19**	**6**
3:00 AM	4	3	6	**13**	**4**
4:00 AM	17	11	3	**31**	**10**
5:00 AM	40	46	22	**108**	**36**
6:00 AM	139	146	114	**399**	**133**
7:00 AM	280	273	249	**802**	**267**
8:00 AM	448	360	493	**1301**	**434**
9:00 AM	516	480	667	**1663**	**554**
10:00 AM	697	671	813	**2181**	**727**
11:00 AM	841	969	992	**2802**	**934**
12:00 PM	990	980	1067	**3037**	**1012**
1:00 PM	919	950	1052	**2921**	**974**
2:00 PM	893	1046	914	**2853**	**951**
3:00 PM	869	993	842	**2704**	**901**
4:00 PM	791	997	713	**2501**	**834**
5:00 PM	578	870	538	**1986**	**662**
6:00 PM	379	468	332	**1179**	**393**
7:00 PM	213	313	243	**769**	**256**
8:00 PM	99	177	124	**400**	**133**
9:00 PM	69	168	86	**323**	**108**
10:00 PM	57	78	48	**183**	**61**
11:00 PM	35	20	74	**129**	**43**
Total	**8904**	**10036**	**9420**	**28360**	**9453**
Percentages	**31.40%**	**35.39%**	**33.22%**	**100.00%**	**33.33%**

Thursday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	2	0	**3**	2	5	4	2	**13**	**16**
1:00 AM	1	1	0	1	**3**	0	0	0	2	**2**	**5**
2:00 AM	2	0	0	0	**2**	1	1	1	4	**7**	**9**
3:00 AM	0	1	0	0	**1**	0	3	0	0	**3**	**4**
4:00 AM	0	0	0	2	**2**	0	4	2	9	**15**	**17**
5:00 AM	0	1	0	1	**2**	3	9	6	20	**38**	**40**
6:00 AM	0	1	0	1	**2**	21	28	39	49	**137**	**139**
7:00 AM	2	3	10	9	**24**	44	56	63	93	**256**	**280**
8:00 AM	15	10	12	25	**62**	92	84	99	111	**386**	**448**
9:00 AM	23	32	71	40	**166**	96	80	86	88	**350**	**516**
10:00 AM	72	61	122	86	**341**	90	80	79	107	**356**	**697**
11:00 AM	125	96	104	113	**438**	97	92	93	121	**403**	**841**
12:00 PM	153	109	154	158	**574**	102	99	104	111	**416**	**990**
1:00 PM	160	126	99	142	**527**	102	100	86	104	**392**	**919**
2:00 PM	128	114	139	120	**501**	96	92	95	109	**392**	**893**
3:00 PM	144	105	93	111	**453**	101	99	102	114	**416**	**869**
4:00 PM	95	60	86	97	**338**	129	88	124	112	**453**	**791**
5:00 PM	78	51	83	40	**252**	83	88	71	84	**326**	**578**
6:00 PM	61	22	33	29	**145**	72	51	53	58	**234**	**379**
7:00 PM	20	8	3	8	**39**	44	44	42	44	**174**	**213**
8:00 PM	2	2	1	0	**5**	33	23	18	20	**94**	**99**
9:00 PM	1	1	3	2	**7**	18	12	15	17	**62**	**69**
10:00 PM	7	1	0	1	**9**	13	14	11	10	**48**	**57**
11:00 PM	1	0	0	0	**1**	12	10	7	5	**34**	**35**
12:00 AM	43.8%				**3897**	56.2%				**5007**	
	8904										

AM Peak Hr 11:00 am to 12:00 pm **AM Peak 841** **AM PHF 0.898504**
PM Peak Hr 12:30 pm to 1:30 pm **PM Peak 1015** **PM PHF 0.943309**

Friday

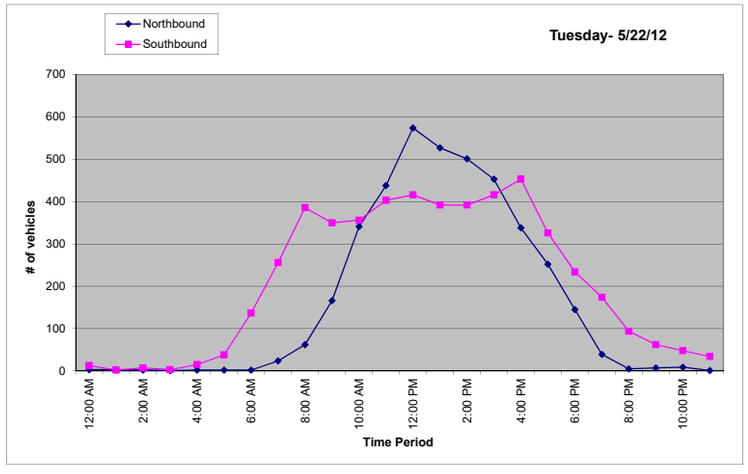
	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	0	0	1	0	**1**	2	3	2	2	**9**	**10**
1:00 AM	0	0	0	0	**0**	0	2	0	3	**5**	**5**
2:00 AM	0	0	0	0	**0**	0	0	2	0	**2**	**2**
3:00 AM	0	0	0	0	**0**	1	0	1	1	**3**	**3**
4:00 AM	0	0	0	0	**0**	1	0	5	5	**11**	**11**
5:00 AM	0	0	0	0	**0**	8	9	11	18	**46**	**46**
6:00 AM	0	1	1	4	**6**	24	35	44	37	**140**	**146**
7:00 AM	4	5	4	13	**26**	40	45	76	86	**247**	**273**
8:00 AM	5	11	7	18	**41**	86	81	74	78	**319**	**360**
9:00 AM	26	23	23	41	**113**	85	80	92	110	**367**	**480**
10:00 AM	63	76	72	98	**309**	87	106	76	93	**362**	**671**
11:00 AM	92	123	143	133	**491**	98	122	137	121	**478**	**969**
12:00 PM	127	146	132	167	**572**	103	99	106	100	**408**	**980**
1:00 PM	131	141	115	146	**533**	101	112	102	102	**417**	**950**
2:00 PM	148	117	166	137	**568**	115	121	90	152	**478**	**1046**
3:00 PM	118	140	151	153	**562**	111	93	123	104	**431**	**993**
4:00 PM	144	140	130	150	**564**	106	101	120	106	**433**	**997**
5:00 PM	114	128	116	83	**441**	110	114	111	94	**429**	**870**
6:00 PM	63	52	36	45	**196**	67	73	71	61	**272**	**468**
7:00 PM	50	33	12	20	**115**	69	46	39	44	**198**	**313**
8:00 PM	11	11	6	11	**39**	39	36	31	32	**138**	**177**
9:00 PM	21	31	7	8	**67**	28	21	26	26	**101**	**168**
10:00 PM	3	14	7	1	**25**	17	12	11	13	**53**	**78**
11:00 PM	0	0	0	0	**0**	8	9	2	1	**20**	**20**
Total	46.5%				**4669**	53.5%				**5367**	
	10036										

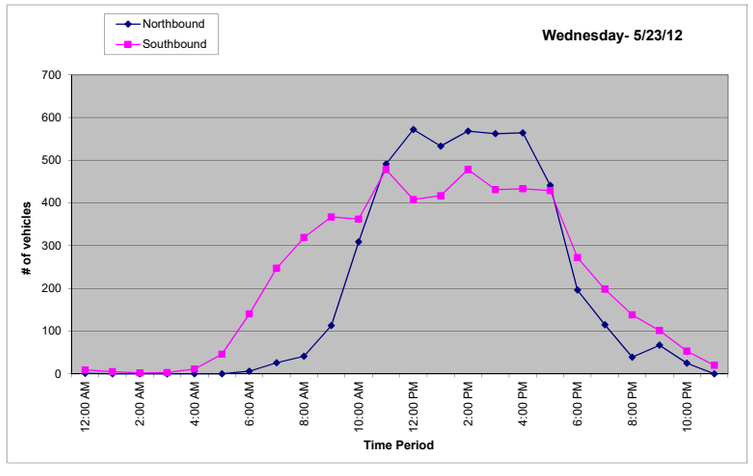
AM Peak Hr 11:00 am to 12:00 pm **AM Peak 969** **AM PHF 0.865179**
PM Peak Hr 2:00 pm to 3:00 pm **PM Peak 1046** **PM PHF 0.904844**

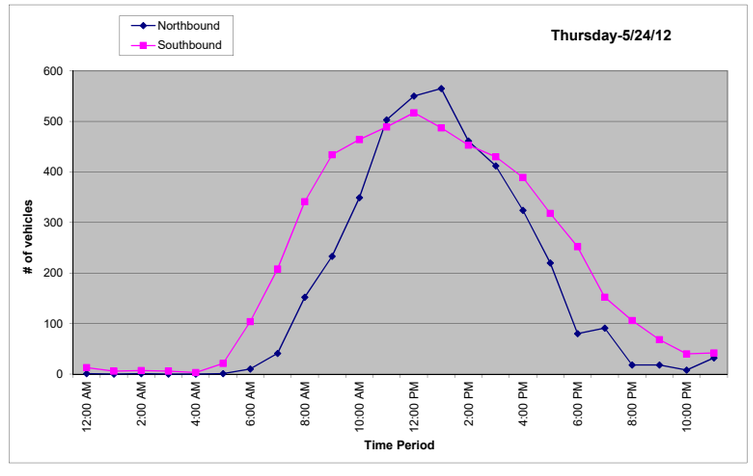
Saturday

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	0	0	**1**	6	2	2	3	**13**	**14**
1:00 AM	0	0	0	0	**0**	3	0	2	1	**6**	**6**
2:00 AM	0	0	1	0	**1**	2	0	2	3	**7**	**8**
3:00 AM	0	0	0	0	**0**	1	3	1	1	**6**	**6**
4:00 AM	0	0	0	0	**0**	1	0	1	1	**3**	**3**
5:00 AM	0	1	0	0	**1**	7	2	6	6	**21**	**22**
6:00 AM	1	2	1	6	**10**	17	23	24	40	**104**	**114**
7:00 AM	15	3	13	10	**41**	42	49	72	45	**208**	**249**
8:00 AM	23	34	40	55	**152**	85	87	90	79	**341**	**493**
9:00 AM	28	42	63	100	**233**	101	98	106	129	**434**	**667**
10:00 AM	62	83	88	116	**349**	109	115	133	107	**464**	**813**
11:00 AM	99	127	162	115	**503**	122	130	114	123	**489**	**992**
12:00 PM	108	136	137	169	**550**	132	140	133	112	**517**	**1067**
1:00 PM	136	147	153	129	**565**	128	130	123	106	**487**	**1052**
2:00 PM	126	116	98	121	**461**	103	121	132	97	**453**	**914**
3:00 PM	89	113	103	107	**412**	117	102	112	99	**430**	**842**
4:00 PM	81	77	103	63	**324**	99	105	80	105	**389**	**713**
5:00 PM	100	49	33	38	**220**	80	71	90	77	**318**	**538**
6:00 PM	40	34	4	2	**80**	79	74	54	45	**252**	**332**
7:00 PM	57	30	4	0	**91**	42	39	42	29	**152**	**243**
8:00 PM	8	2	5	3	**18**	27	29	21	29	**106**	**124**
9:00 PM	10	8	0	0	**18**	21	16	13	18	**68**	**86**
10:00 PM	0	1	4	3	**8**	12	11	9	8	**40**	**48**
11:00 PM	1	3	14	14	**32**	7	7	14	14	**42**	**74**
Total	43.2%				**4070**	56.8%				**5350**	
	9420										

AM Peak Hr 11:00 am to 12:00 pm **AM Peak 992** **AM PHF 0.898551**
PM Peak Hr 12:45 pm to 1:45 pm **PM Peak 1098** **PM PHF 0.976868**







Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

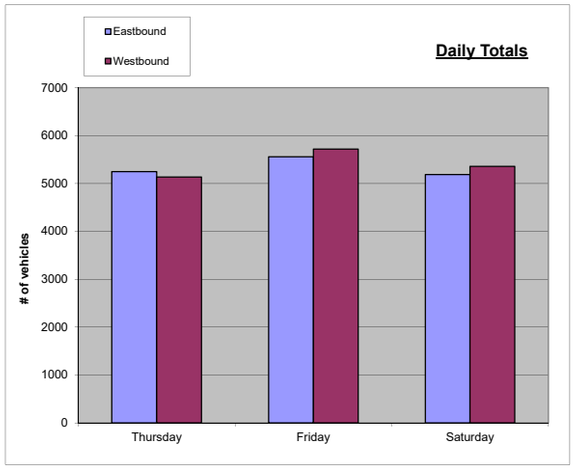
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Report Prepared For:

Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

3 Day Volume Count Report

Location No. 6
Road Name SR 41
Nearest Cross St East of Main Street
Survey Date 3/17/16 thru 3/19/16
Latitude 35.381116°
Longitude -120.852670°
Peak Day Wednesday
Number of Lanes 2
Comments



SUMMARY					
Hour	17-Thu	18-Fri	19-Sat	Total	ADT
12:00 AM	34	28	41	103	34
1:00 AM	16	23	31	70	23
2:00 AM	15	18	30	63	21
3:00 AM	12	13	17	42	14
4:00 AM	40	35	39	114	38
5:00 AM	87	134	88	309	103
6:00 AM	309	390	210	909	303
7:00 AM	674	664	375	1713	571
8:00 AM	714	642	564	1920	640
9:00 AM	610	640	714	1964	655
10:00 AM	670	711	828	2209	736
11:00 AM	697	802	937	2436	812
12:00 PM	713	793	941	2447	816
1:00 PM	755	795	939	2489	830
2:00 PM	754	917	863	2534	845
3:00 PM	873	916	841	2630	877
4:00 PM	916	962	836	2714	905
5:00 PM	849	910	680	2439	813
6:00 PM	558	595	528	1681	560
7:00 PM	388	462	340	1190	397
8:00 PM	299	311	244	854	285
9:00 PM	204	236	193	633	211
10:00 PM	123	175	154	452	151
11:00 PM	71	100	108	279	93
Total	10381	11272	10541	32194	10731
Percentages	32.25%	35.01%	32.74%	100.00%	33.33%

Thursday

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	3	4	6	3	**16**	9	4	5	0	**18**	**34**
1:00 AM	2	3	0	2	**7**	2	1	4	2	**9**	**16**
2:00 AM	1	5	1	2	**9**	1	0	3	2	**6**	**15**
3:00 AM	0	3	3	0	**6**	1	3	1	1	**6**	**12**
4:00 AM	2	4	4	5	**15**	2	6	9	8	**25**	**40**
5:00 AM	7	12	17	12	**48**	7	5	13	14	**39**	**87**
6:00 AM	28	44	44	44	**160**	24	28	61	36	**149**	**309**
7:00 AM	63	82	93	84	**322**	60	82	80	130	**352**	**674**
8:00 AM	95	75	66	71	**307**	118	81	106	102	**407**	**714**
9:00 AM	63	59	82	79	**283**	91	62	84	90	**327**	**610**
10:00 AM	81	85	79	83	**328**	93	76	88	85	**342**	**670**
11:00 AM	84	76	79	81	**320**	94	92	92	99	**377**	**697**
12:00 PM	87	79	110	88	**364**	85	90	83	91	**349**	**713**
1:00 PM	90	86	89	106	**371**	84	103	87	110	**384**	**755**
2:00 PM	105	87	100	77	**369**	81	91	95	118	**385**	**754**
3:00 PM	104	130	130	114	**478**	89	96	103	107	**395**	**873**
4:00 PM	115	119	105	134	**473**	115	106	102	120	**443**	**916**
5:00 PM	135	102	129	90	**456**	94	97	96	106	**393**	**849**
6:00 PM	72	74	82	68	**296**	70	62	66	64	**262**	**558**
7:00 PM	70	66	58	39	**233**	46	37	36	36	**155**	**388**
8:00 PM	52	53	37	35	**177**	33	37	24	28	**122**	**299**
9:00 PM	29	34	20	27	**110**	33	20	24	17	**94**	**204**
10:00 PM	17	21	17	12	**67**	8	16	14	18	**56**	**123**
11:00 PM	8	10	6	9	**33**	13	9	11	5	**38**	**71**
12:00 AM	50.6%				**5248**	49.4%				**5133**	
	10381										

AM Peak Hr 7:15 am to 8:15 am — AM Peak 764 — AM PHF 0.892523
PM Peak Hr 4:00 pm to 5:00 pm — PM Peak 916 — PM PHF 0.901575

Friday

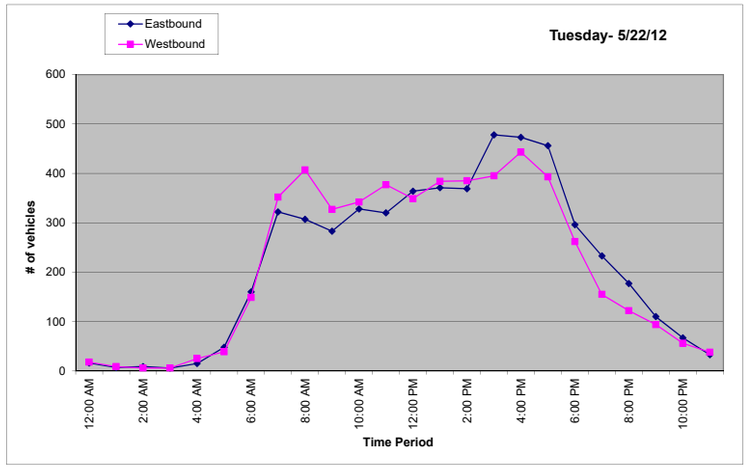
	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	2	4	5	3	**14**	5	4	3	2	**14**	**28**
1:00 AM	5	3	2	3	**13**	3	2	3	2	**10**	**23**
2:00 AM	3	2	1	1	**7**	3	3	3	2	**11**	**18**
3:00 AM	1	1	2	1	**5**	5	0	2	1	**8**	**13**
4:00 AM	5	3	4	9	**21**	2	6	5	1	**14**	**35**
5:00 AM	15	23	12	30	**80**	6	8	17	23	**54**	**134**
6:00 AM	44	37	53	62	**196**	29	49	64	52	**194**	**390**
7:00 AM	69	76	82	59	**286**	76	85	113	104	**378**	**664**
8:00 AM	78	85	66	66	**295**	92	94	75	86	**347**	**642**
9:00 AM	78	76	70	65	**289**	106	70	88	87	**351**	**640**
10:00 AM	70	77	114	98	**359**	96	81	92	83	**352**	**711**
11:00 AM	101	98	94	90	**383**	99	100	123	97	**419**	**802**
12:00 PM	103	109	114	106	**432**	68	105	96	92	**361**	**793**
1:00 PM	107	78	107	92	**384**	97	107	113	94	**411**	**795**
2:00 PM	131	92	121	113	**457**	111	142	98	109	**460**	**917**
3:00 PM	110	117	117	113	**457**	114	115	110	120	**459**	**916**
4:00 PM	127	135	111	102	**475**	134	105	119	129	**487**	**962**
5:00 PM	143	110	120	102	**475**	108	108	120	99	**435**	**910**
6:00 PM	77	83	71	65	**296**	87	73	72	67	**299**	**595**
7:00 PM	69	55	49	66	**239**	63	62	45	53	**223**	**462**
8:00 PM	43	38	34	36	**151**	33	40	43	44	**160**	**311**
9:00 PM	26	28	32	28	**114**	32	27	22	41	**122**	**236**
10:00 PM	29	19	17	19	**84**	21	31	19	20	**91**	**175**
11:00 PM	14	11	13	5	**43**	19	14	11	13	**57**	**100**
Total	49.3%				**5555**	50.7%				**5717**	
	11272										

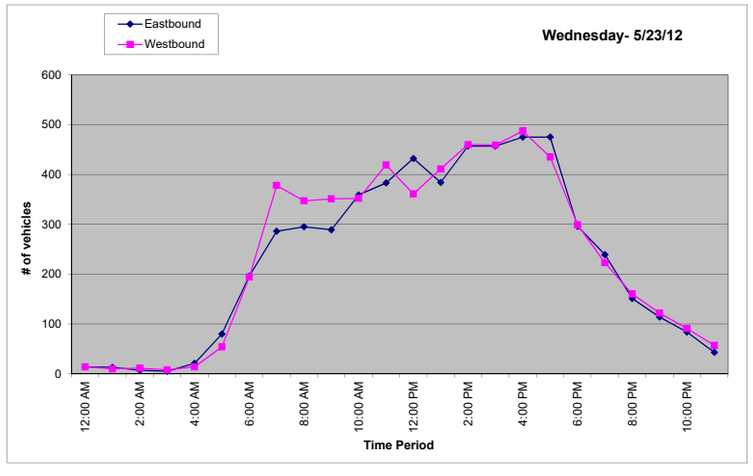
AM Peak Hr 11:00 am to 12:00 pm — AM Peak 802 — AM PHF 0.923963
PM Peak Hr 3:45 pm to 4:45 pm — PM Peak 964 — PM PHF 0.923372

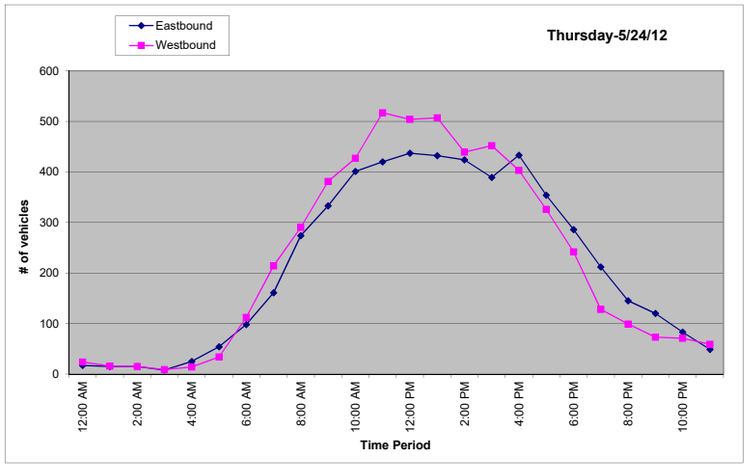
Saturday

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	6	6	4	1	**17**	8	6	6	4	**24**	**41**
1:00 AM	1	9	4	1	**15**	2	6	3	5	**16**	**31**
2:00 AM	3	5	6	1	**15**	2	4	2	7	**15**	**30**
3:00 AM	2	0	2	4	**8**	2	2	3	2	**9**	**17**
4:00 AM	6	4	10	5	**25**	2	5	1	6	**14**	**39**
5:00 AM	7	10	18	19	**54**	4	10	9	11	**34**	**88**
6:00 AM	21	27	26	24	**98**	22	29	21	40	**112**	**210**
7:00 AM	38	38	39	46	**161**	46	48	55	65	**214**	**375**
8:00 AM	59	65	72	78	**274**	60	78	73	79	**290**	**564**
9:00 AM	86	72	79	96	**333**	96	95	90	100	**381**	**714**
10:00 AM	102	92	98	109	**401**	109	89	122	107	**427**	**828**
11:00 AM	98	109	114	99	**420**	122	126	122	147	**517**	**937**
12:00 PM	115	110	101	111	**437**	148	133	118	105	**504**	**941**
1:00 PM	95	104	111	122	**432**	132	134	126	115	**507**	**939**
2:00 PM	90	108	112	114	**424**	95	118	138	88	**439**	**863**
3:00 PM	99	101	97	92	**389**	130	92	104	126	**452**	**841**
4:00 PM	108	111	108	106	**433**	110	100	88	105	**403**	**836**
5:00 PM	81	88	95	90	**354**	78	81	70	97	**326**	**680**
6:00 PM	75	79	68	64	**286**	75	64	61	42	**242**	**528**
7:00 PM	75	54	39	44	**212**	28	27	34	39	**128**	**340**
8:00 PM	42	42	34	27	**145**	27	34	18	20	**99**	**244**
9:00 PM	28	28	35	29	**120**	19	21	14	19	**73**	**193**
10:00 PM	29	16	14	24	**83**	22	20	20	9	**71**	**154**
11:00 PM	10	11	14	14	**49**	16	15	14	14	**59**	**108**
Total	49.2%				**5185**	50.8%				**5356**	
	10541										

AM Peak Hr 11:00 am to 12:00 pm — AM Peak 937 — AM PHF 0.952236
PM Peak Hr 12:00 pm to 1:00 pm — PM Peak 941 — PM PHF 0.894487







Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

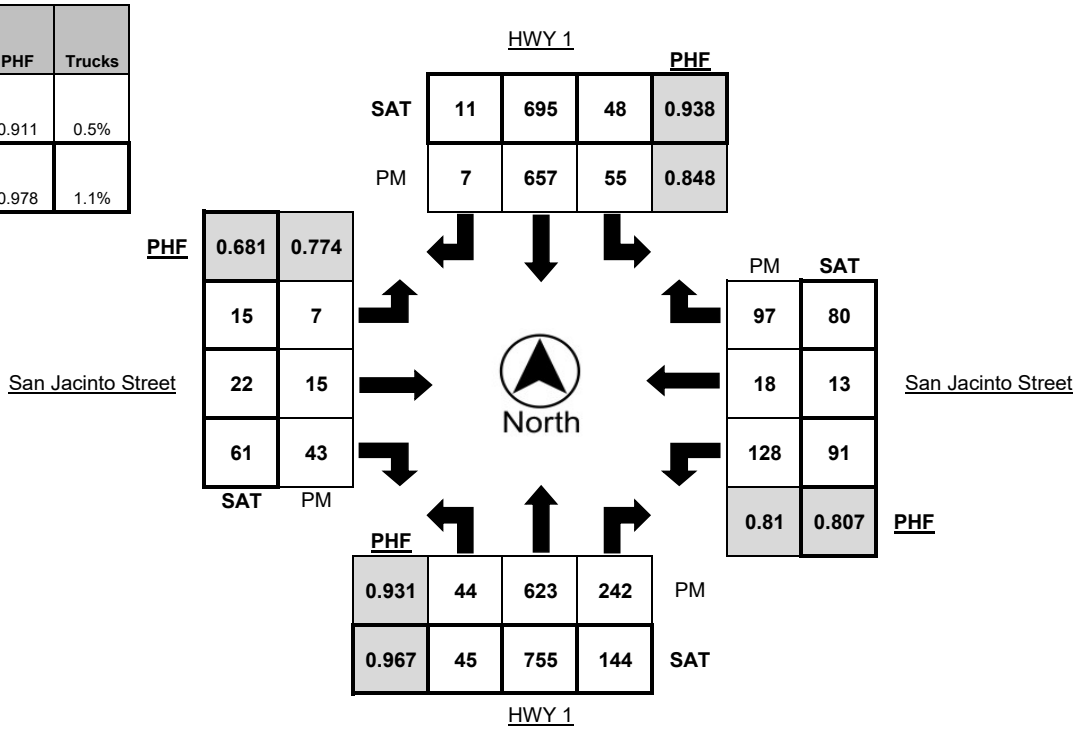
LOCATION HWY 1 @ San Jacinto Street
LATITUDE 35.393811°
COUNTY San Luis Obispo
LONGITUDE -120.860556°
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	14	146	48	4	18	136	0	0	5	7	9	0	25	4	29	2
4:15 PM - 4:30 PM	14	154	61	3	19	190	3	0	3	2	10	0	35	8	32	0
4:30 PM - 4:45 PM	7	157	52	0	9	156	0	0	1	2	10	2	30	3	17	2
4:45 PM - 5:00 PM	12	162	70	0	10	170	2	0	1	6	9	0	33	4	24	0
5:00 PM - 5:15 PM	11	150	59	3	17	141	2	0	2	5	14	0	30	3	24	0
5:15 PM - 5:30 PM	6	162	61	0	13	157	0	0	1	3	14	1	27	6	12	0
5:30 PM - 5:45 PM	17	160	52	0	18	134	3	0	0	3	19	2	28	3	14	0
5:45 PM - 6:00 PM	11	148	47	3	13	130	2	0	0	3	8	0	24	3	14	0
TOTAL	**92**	**1239**	**450**	**13**	**117**	**1214**	**12**	**0**	**13**	**31**	**93**	**5**	**232**	**34**	**166**	**4**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	13	184	31	0	15	161	1	0	3	9	17	0	23	12	11	0
11:15 AM - 11:30 AM	11	185	36	0	13	150	4	0	1	8	16	0	33	3	13	0
11:30 AM - 11:45 AM	17	179	28	2	15	162	0	1	1	3	12	0	28	6	18	1
11:45 AM - 12:00 PM	15	176	38	4	7	192	2	0	3	7	10	0	26	2	16	0
12:00 PM - 12:15 PM	13	194	37	8	10	165	2	0	6	7	23	0	17	5	16	0
12:15 PM - 12:30 PM	10	201	27	2	11	172	5	0	3	3	8	0	22	3	20	0
12:30 PM - 12:45 PM	7	184	42	2	20	166	2	4	3	5	20	0	26	3	28	2
12:45 PM - 1:00 PM	8	158	27	2	19	157	4	2	1	3	18	0	24	7	28	1
TOTAL	**94**	**1461**	**266**	**20**	**110**	**1325**	**20**	**7**	**21**	**45**	**124**	**0**	**199**	**41**	**150**	**4**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:15 PM - 5:15 PM	44	623	242	6	55	657	7	0	7	15	43	2	128	18	97	2
11:45 AM - 12:45 PM	45	755	144	16	48	695	11	4	15	22	61	0	91	13	80	2

	PHF	Trucks
PM (Weekday)	0.911	0.5%
MID (Saturday)	0.978	1.1%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

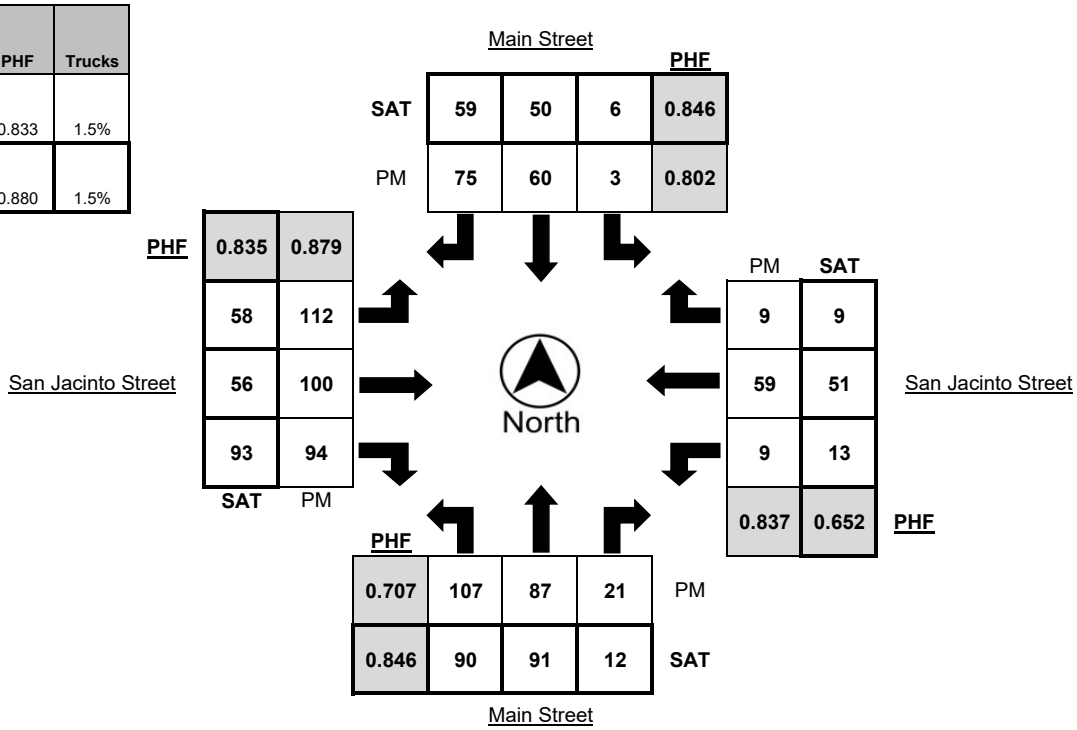
LOCATION Main Street @ San Jacinto Street
LATITUDE 35.393822°
COUNTY San Luis Obispo
LONGITUDE -120.860094°
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	29	18	2	0	3	13	17	0	15	18	36	3	5	8	2	0
4:15 PM - 4:30 PM	35	34	7	2	1	19	23	1	32	23	27	3	2	16	2	1
4:30 PM - 4:45 PM	21	18	5	1	1	16	15	1	13	25	23	0	3	16	2	1
4:45 PM - 5:00 PM	23	21	2	0	0	12	19	0	38	27	22	0	1	11	1	0
5:00 PM - 5:15 PM	28	14	7	0	1	13	18	0	29	25	22	1	3	16	4	0
5:15 PM - 5:30 PM	16	21	5	0	1	18	18	0	28	22	30	1	7	16	2	0
5:30 PM - 5:45 PM	15	20	5	0	0	13	16	0	25	21	21	1	2	16	2	0
5:45 PM - 6:00 PM	18	15	5	1	0	13	13	0	20	24	22	0	4	8	2	0
TOTAL	**185**	**161**	**38**	**4**	**7**	**117**	**139**	**2**	**200**	**185**	**203**	**9**	**27**	**107**	**17**	**2**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	10	14	5	1	2	18	12	0	11	22	19	0	5	15	3	1
11:15 AM - 11:30 AM	16	16	4	0	2	15	26	0	25	10	26	1	3	15	1	0
11:30 AM - 11:45 AM	14	20	5	2	1	23	18	0	15	11	21	1	1	15	3	1
11:45 AM - 12:00 PM	22	23	1	0	0	7	15	0	22	13	16	0	3	12	4	0
12:00 PM - 12:15 PM	17	22	2	0	2	12	13	0	21	14	14	0	2	8	4	1
12:15 PM - 12:30 PM	22	27	3	0	1	12	13	0	12	15	18	1	1	12	0	0
12:30 PM - 12:45 PM	21	19	3	0	1	16	17	0	19	13	30	3	9	16	3	2
12:45 PM - 1:00 PM	30	23	4	1	2	10	16	0	6	14	31	0	1	15	2	1
TOTAL	**152**	**164**	**27**	**4**	**11**	**113**	**130**	**0**	**131**	**112**	**175**	**6**	**25**	**108**	**20**	**6**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:15 PM - 5:15 PM	107	87	21	3	3	60	75	2	112	100	94	4	9	59	9	2
12:00 PM - 1:00 PM	90	91	12	1	6	50	59	0	58	56	93	4	13	51	9	4

	PHF	Trucks
PM (Weekday)	0.833	1.5%
MID (Saturday)	0.880	1.5%



Metro Traffic Data Inc.
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Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION HWY 1 SB Ramps @ SR 41 **LATITUDE** 35.379964°

COUNTY San Luis Obispo **LONGITUDE** -120.855947°

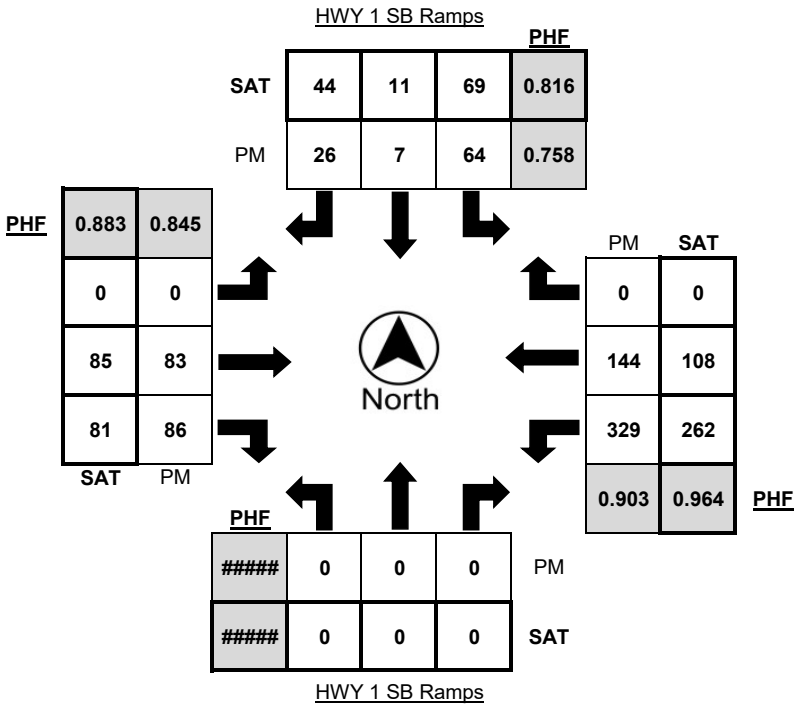
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16 **WEATHER** Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	0	0	0	8	4	3	0	0	14	19	1	73	29	0	6
4:15 PM - 4:30 PM	0	0	0	0	18	4	3	2	0	22	28	0	88	35	0	0
4:30 PM - 4:45 PM	0	0	0	0	16	2	8	1	0	21	20	0	60	37	0	2
4:45 PM - 5:00 PM	0	0	0	0	22	1	9	0	0	22	17	1	96	35	0	1
5:00 PM - 5:15 PM	0	0	0	0	8	0	6	0	0	18	21	0	85	37	0	3
5:15 PM - 5:30 PM	0	0	0	0	16	0	5	0	0	23	24	1	64	27	0	3
5:30 PM - 5:45 PM	0	0	0	0	22	1	8	2	0	25	30	0	68	27	0	1
5:45 PM - 6:00 PM	0	0	0	0	12	1	6	0	0	27	26	1	63	39	0	1
TOTAL	**0**	**0**	**0**	**0**	**122**	**13**	**48**	**5**	**0**	**172**	**185**	**4**	**597**	**266**	**0**	**17**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	0	0	0	0	19	3	10	0	0	34	21	3	53	28	0	1
11:15 AM - 11:30 AM	0	0	0	0	26	4	3	0	0	17	20	4	48	19	0	0
11:30 AM - 11:45 AM	0	0	0	0	16	3	5	0	0	20	15	4	44	26	0	2
11:45 AM - 12:00 PM	0	0	0	0	21	0	5	0	0	14	15	0	60	34	0	3
12:00 PM - 12:15 PM	0	0	0	0	15	0	11	0	0	21	26	1	66	28	0	1
12:15 PM - 12:30 PM	0	0	0	0	11	1	11	0	0	28	13	0	67	24	0	1
12:30 PM - 12:45 PM	0	0	0	0	25	2	11	3	0	16	22	1	60	29	0	1
12:45 PM - 1:00 PM	0	0	0	0	18	8	11	0	0	20	20	2	69	27	0	2
TOTAL	**0**	**0**	**0**	**0**	**151**	**21**	**67**	**3**	**0**	**170**	**152**	**15**	**467**	**215**	**0**	**11**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:15 PM - 5:15 PM	0	0	0	0	64	7	26	3	0	83	86	1	329	144	0	6
12:00 PM - 1:00 PM	0	0	0	0	69	11	44	3	0	85	81	4	262	108	0	5

	PHF	Trucks
PM (Weekday)	0.915	1.4%
MID (Saturday)	0.954	1.8%



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Hanford, CA 93230

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Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Main Street @ SR 41 **LATITUDE** 35.380211°

COUNTY San Luis Obispo **LONGITUDE** -120.854876°

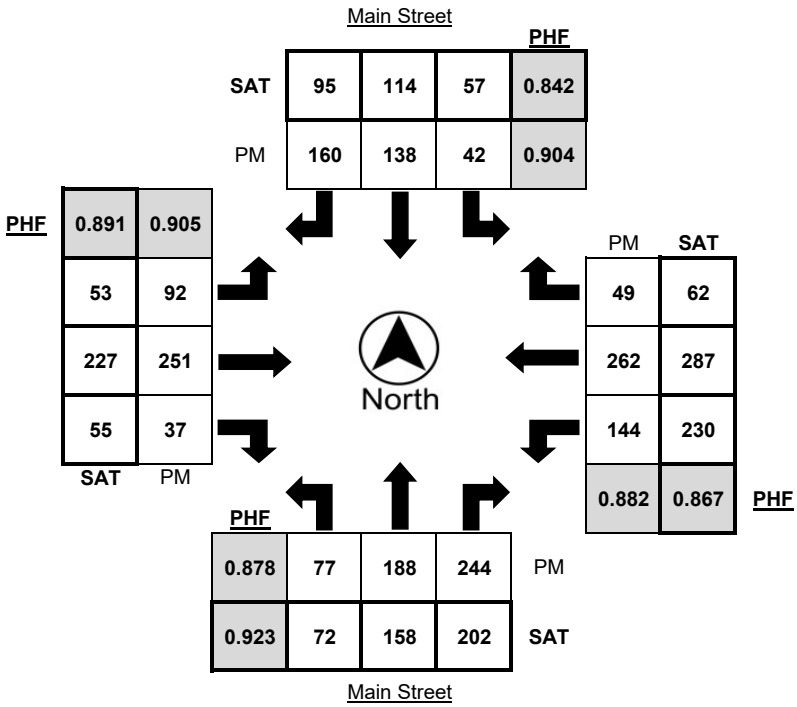
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16 **WEATHER** Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	15	42	54	2	7	39	29	2	17	46	8	1	43	64	14	2
4:15 PM - 4:30 PM	23	59	63	0	12	35	40	1	17	64	9	3	32	67	11	1
4:30 PM - 4:45 PM	11	36	45	0	6	48	25	1	26	61	9	0	38	67	13	3
4:45 PM - 5:00 PM	19	52	59	3	12	27	41	0	22	70	13	0	45	72	12	1
5:00 PM - 5:15 PM	24	41	77	2	12	28	54	3	27	56	6	0	29	56	13	1
5:15 PM - 5:30 PM	13	50	67	1	6	31	32	0	26	51	10	0	32	62	9	1
5:30 PM - 5:45 PM	16	38	50	3	8	19	23	1	29	64	13	0	30	72	5	0
5:45 PM - 6:00 PM	13	35	43	1	10	26	26	0	31	58	19	2	29	68	9	2
TOTAL	**134**	**353**	**458**	**12**	**73**	**253**	**270**	**8**	**195**	**470**	**87**	**6**	**278**	**528**	**86**	**11**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	8	42	53	0	17	29	28	0	16	37	15	2	57	67	14	2
11:15 AM - 11:30 AM	16	37	44	2	9	36	23	0	16	48	19	0	37	56	15	4
11:30 AM - 11:45 AM	21	40	46	3	9	31	26	1	18	56	12	0	57	66	8	1
11:45 AM - 12:00 PM	19	34	47	2	8	30	31	0	19	55	14	2	53	70	9	0
12:00 PM - 12:15 PM	19	39	55	2	19	25	25	0	11	44	10	0	44	66	16	0
12:15 PM - 12:30 PM	16	44	44	1	10	18	25	1	16	62	16	0	64	71	19	0
12:30 PM - 12:45 PM	18	28	52	1	11	35	19	0	10	61	13	3	61	87	19	0
12:45 PM - 1:00 PM	19	47	51	0	17	36	26	2	16	60	16	1	61	63	8	3
TOTAL	**136**	**311**	**392**	**11**	**100**	**240**	**203**	**4**	**122**	**423**	**115**	**8**	**434**	**546**	**108**	**10**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:15 PM - 5:15 PM	77	188	244	5	42	138	160	5	92	251	37	3	144	262	49	6
12:00 PM - 1:00 PM	72	158	202	4	57	114	95	3	53	227	55	4	230	287	62	3

	PHF	Trucks
PM (Weekday)	0.948	1.1%
MID (Saturday)	0.960	0.9%



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Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

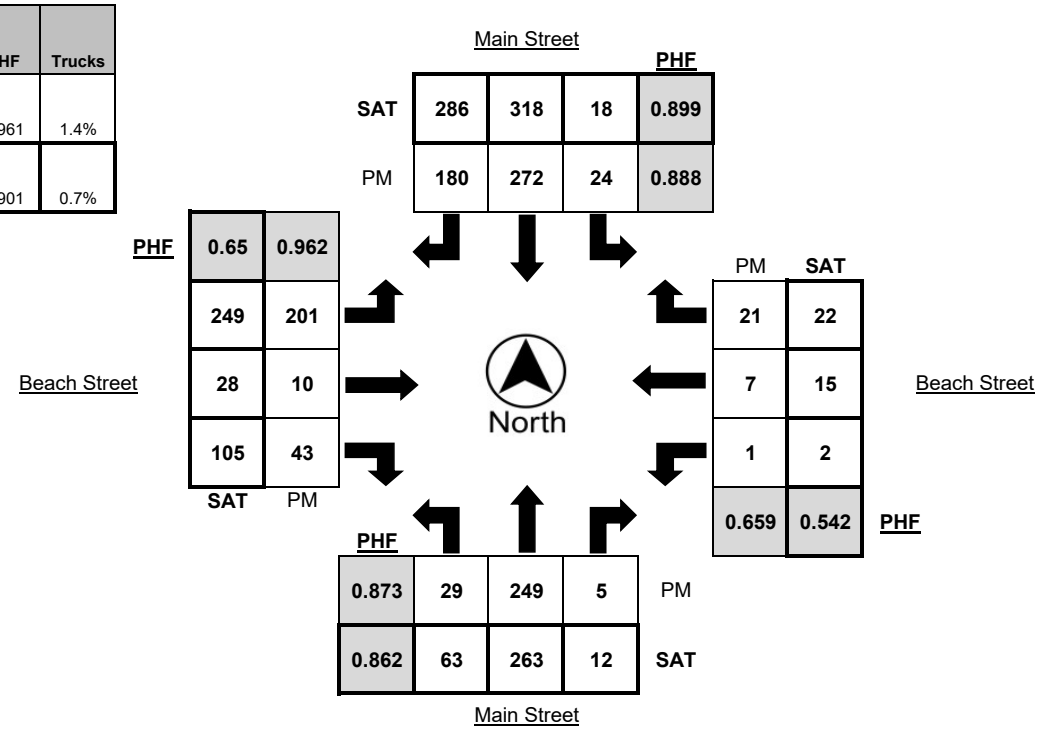
LOCATION Main Street @ Beach Street
LATITUDE 35.368778°
COUNTY San Luis Obispo
LONGITUDE -120.850038°
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	7	52	0	2	14	71	49	1	56	1	9	2	0	2	1	0
4:15 PM - 4:30 PM	5	74	1	2	5	67	43	0	50	3	12	0	1	1	9	0
4:30 PM - 4:45 PM	7	55	1	1	2	66	41	2	45	2	15	1	0	3	4	0
4:45 PM - 5:00 PM	10	68	3	2	3	68	47	0	50	4	7	2	0	1	7	0
5:00 PM - 5:15 PM	14	64	1	0	2	49	32	2	45	5	10	1	1	4	7	0
5:15 PM - 5:30 PM	15	54	1	0	7	52	40	0	38	3	9	0	0	1	4	0
5:30 PM - 5:45 PM	13	45	0	0	4	62	31	0	45	3	17	3	0	2	5	0
5:45 PM - 6:00 PM	10	39	0	0	3	51	35	1	35	3	12	0	0	0	4	0
TOTAL	**81**	**451**	**7**	**7**	**40**	**486**	**318**	**6**	**364**	**24**	**91**	**9**	**2**	**14**	**41**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	18	48	4	1	4	71	73	3	52	5	21	0	1	5	9	0
11:15 AM - 11:30 AM	15	56	4	2	6	73	59	3	56	0	11	1	2	3	7	0
11:30 AM - 11:45 AM	13	60	0	2	4	72	61	0	57	5	22	1	1	0	3	0
11:45 AM - 12:00 PM	14	63	2	0	4	85	82	0	46	5	26	0	1	6	6	0
12:00 PM - 12:15 PM	17	78	3	0	3	73	67	2	55	6	22	0	0	1	4	0
12:15 PM - 12:30 PM	18	61	4	2	2	74	59	1	98	9	40	3	1	8	9	0
12:30 PM - 12:45 PM	14	61	3	1	9	86	78	0	50	8	17	1	0	0	3	0
12:45 PM - 1:00 PM	9	66	1	0	3	78	80	4	63	10	14	0	2	1	5	0
TOTAL	**118**	**493**	**21**	**8**	**35**	**612**	**559**	**13**	**477**	**48**	**173**	**6**	**8**	**24**	**46**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 5:00 PM	29	249	5	7	24	272	180	3	201	10	43	5	1	7	21	0
11:45 AM - 12:45 PM	63	263	12	3	18	318	286	3	249	28	105	4	2	15	22	0

	PHF	Trucks
PM (Weekday)	0.961	1.4%
MID (Saturday)	0.901	0.7%



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Turning Movement Report

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

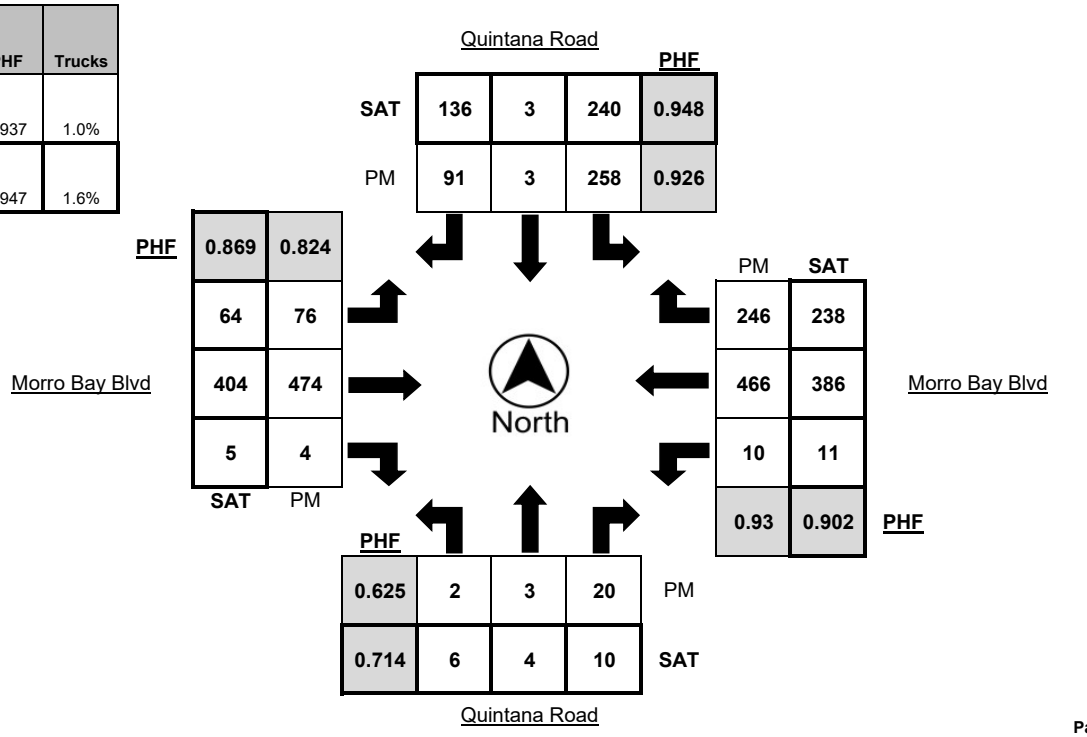
LOCATION Morro Bay Blvd @ Quintana Road
LATITUDE 35.366452°
COUNTY San Luis Obispo
LONGITUDE -120.841059°
COLLECTION DATE Thursday 3/17/16 & Saturday 3/19/16
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time (Weekday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	1	4	0	62	0	27	0	21	106	2	2	3	109	62	1
4:15 PM - 4:30 PM	1	1	8	0	69	2	24	0	20	90	0	2	3	124	67	2
4:30 PM - 4:45 PM	0	0	3	0	66	0	22	1	23	144	1	4	3	117	62	2
4:45 PM - 5:00 PM	1	1	5	0	61	1	18	0	12	134	1	0	1	116	55	3
5:00 PM - 5:15 PM	0	0	1	0	51	2	23	1	18	112	1	3	0	120	59	2
5:15 PM - 5:30 PM	2	0	2	0	63	1	25	0	9	112	0	2	1	108	78	1
5:30 PM - 5:45 PM	1	1	7	0	33	0	17	0	18	119	1	3	2	121	59	2
5:45 PM - 6:00 PM	1	1	1	0	67	0	35	1	13	85	1	0	0	104	67	2
TOTAL	**6**	**5**	**31**	**0**	**472**	**6**	**191**	**3**	**134**	**902**	**7**	**16**	**13**	**919**	**509**	**15**

	Northbound				Southbound				Eastbound				Westbound			
Time (Saturday)	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	1	3	1	0	25	0	9	1	20	88	0	2	0	70	51	1
11:15 AM - 11:30 AM	2	0	4	0	74	1	30	5	19	83	0	0	0	93	55	0
11:30 AM - 11:45 AM	0	0	6	0	50	1	21	0	21	107	1	2	0	89	44	2
11:45 AM - 12:00 PM	2	0	1	1	63	0	37	4	13	76	3	1	5	101	70	1
12:00 PM - 12:15 PM	1	2	4	0	58	2	39	2	16	106	1	3	1	105	53	5
12:15 PM - 12:30 PM	2	2	2	0	54	1	33	0	19	103	0	4	1	86	47	1
12:30 PM - 12:45 PM	1	0	3	0	65	0	27	1	16	119	1	1	4	94	68	0
12:45 PM - 1:00 PM	0	0	2	0	57	0	34	1	12	86	0	0	0	108	69	0
TOTAL	**9**	**7**	**23**	**1**	**446**	**5**	**230**	**14**	**136**	**768**	**6**	**13**	**11**	**746**	**457**	**10**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 5:00 PM	2	3	20	0	258	3	91	1	76	474	4	8	10	466	246	8
11:45 AM - 12:45 PM	6	4	10	1	240	3	136	7	64	404	5	9	11	386	238	7

	PHF	Trucks
PM (Weekday)	0.937	1.0%
MID (Saturday)	0.947	1.6%



Daily Southbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street

Posted Speed: 25

Standard Deviation:	5.3 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.8 MPH
Mean Speed:	20.4 MPH	Percent in Ten Mile Pace:	78.3%		
Median Speed:	20.7 MPH			15th Percentile:	15.9 MPH
Modal Speed:	22.5 MPH			90th Percentile:	26.3 MPH
				95th Percentile:	28.4 MPH

Daily Southbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	5.9 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	31.2 MPH
Mean Speed:	25.5 MPH	Percent in Ten Mile Pace:	69.3%		
Median Speed:	26.0 MPH			15th Percentile:	20.5 MPH
Modal Speed:	27.5 MPH			90th Percentile:	32.7 MPH
				95th Percentile:	34.2 MPH

Daily Southbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	6.4 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	31.1 MPH
Mean Speed:	25.0 MPH	Percent in Ten Mile Pace:	64.2%		
Median Speed:	25.6 MPH			15th Percentile:	18.9 MPH
Modal Speed:	27.5 MPH			90th Percentile:	32.7 MPH
				95th Percentile:	34.4 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	5.0 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	21.9 MPH
Mean Speed:	17.1 MPH	Percent in Ten Mile Pace:	74.6%		
Median Speed:	17.5 MPH			15th Percentile:	11.6 MPH
Modal Speed:	17.5 MPH			90th Percentile:	23.1 MPH
				95th Percentile:	24.4 MPH

Daily Northbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	7.5 MPH	Ten Mile Pace:	25 to 34 MPH	85th Percentile:	34.5 MPH
Mean Speed:	27.7 MPH	Percent in Ten Mile Pace:	59.4%		
Median Speed:	28.1 MPH			15th Percentile:	20.9 MPH
Modal Speed:	27.5 MPH			90th Percentile:	36.3 MPH
				95th Percentile:	38.8 MPH

Daily Northbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	7.4 MPH	Ten Mile Pace:	25 to 34 MPH	85th Percentile:	33.7 MPH
Mean Speed:	26.7 MPH	Percent in Ten Mile Pace:	58.1%		
Median Speed:	27.6 MPH			15th Percentile:	19.6 MPH
Modal Speed:	27.5 MPH			90th Percentile:	34.7 MPH
				95th Percentile:	37.2 MPH

Daily Total Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	5.4 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	23.9 MPH
Mean Speed:	18.9 MPH	Percent in Ten Mile Pace:	76.6%		
Median Speed:	18.9 MPH			15th Percentile:	14.8 MPH
Modal Speed:	17.5 MPH			90th Percentile:	24.7 MPH
				95th Percentile:	27.2 MPH

Daily Total Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	6.8 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	33.0 MPH
Mean Speed:	26.5 MPH	Percent in Ten Mile Pace:	60.9%		
Median Speed:	26.9 MPH			15th Percentile:	20.7 MPH
Modal Speed:	27.5 MPH			90th Percentile:	34.3 MPH
				95th Percentile:	36.8 MPH

Daily Total Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Kern Avenue between Anchor Street and Olive Street
Posted Speed: 25

Standard Deviation:	6.9 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	32.7 MPH
Mean Speed:	25.7 MPH	Percent in Ten Mile Pace:	57.7%		
Median Speed:	26.5 MPH			15th Percentile:	19.2 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.9 MPH
				95th Percentile:	35.5 MPH

Daily Southbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.3 MPH	Ten Mile Pace:	25 to 34 MPH	85th Percentile:	33.4 MPH
Mean Speed:	28.0 MPH	Percent in Ten Mile Pace:	68.6%		
Median Speed:	28.0 MPH			15th Percentile:	22.5 MPH
Modal Speed:	27.5 MPH			90th Percentile:	34.3 MPH
				95th Percentile:	36.1 MPH

Daily Southbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.5 MPH	Ten Mile Pace:	25 to 34 MPH	85th Percentile:	33.5 MPH
Mean Speed:	27.9 MPH	Percent in Ten Mile Pace:	66.3%		
Median Speed:	27.8 MPH			15th Percentile:	22.3 MPH
Modal Speed:	27.5 MPH			90th Percentile:	34.5 MPH
				95th Percentile:	37.0 MPH

Daily Southbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.5 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	33.1 MPH
Mean Speed:	27.4 MPH	Percent in Ten Mile Pace:	65.4%		
Median Speed:	27.4 MPH			15th Percentile:	21.9 MPH
Modal Speed:	27.5 MPH			90th Percentile:	34.2 MPH
				95th Percentile:	36.2 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	4.9 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	31.8 MPH
Mean Speed:	26.8 MPH	Percent in Ten Mile Pace:	70.8%		
Median Speed:	27.0 MPH			15th Percentile:	21.6 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.1 MPH
				95th Percentile:	34.3 MPH

Daily Northbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.1 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	32.0 MPH
Mean Speed:	26.8 MPH	Percent in Ten Mile Pace:	70.9%		
Median Speed:	26.9 MPH			15th Percentile:	21.6 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.3 MPH
				95th Percentile:	34.5 MPH

Daily Northbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.4 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	31.9 MPH
Mean Speed:	26.5 MPH	Percent in Ten Mile Pace:	68.8%		
Median Speed:	26.8 MPH			15th Percentile:	21.2 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.1 MPH
				95th Percentile:	34.4 MPH

Daily Total Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.1 MPH	Ten Mile Pace:	25 to 34 MPH	85th Percentile:	32.7 MPH
Mean Speed:	27.3 MPH	Percent in Ten Mile Pace:	67.4%		
Median Speed:	27.5 MPH			15th Percentile:	22.0 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.8 MPH
				95th Percentile:	34.8 MPH

Daily Total Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.3 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	32.7 MPH
Mean Speed:	27.3 MPH	Percent in Ten Mile Pace:	67.1%		
Median Speed:	27.3 MPH			15th Percentile:	21.9 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.9 MPH
				95th Percentile:	35.4 MPH

Daily Total Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Piney Way between South Street and Vista Street
Posted Speed: 25

Standard Deviation:	5.5 MPH	Ten Mile Pace:	20 to 29 MPH	85th Percentile:	32.5 MPH
Mean Speed:	26.9 MPH	Percent in Ten Mile Pace:	67.2%		
Median Speed:	27.1 MPH			15th Percentile:	21.5 MPH
Modal Speed:	27.5 MPH			90th Percentile:	33.7 MPH
				95th Percentile:	34.9 MPH

Daily Southbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.8 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	28.3 MPH
Mean Speed:	21.4 MPH	Percent in Ten Mile Pace:	56.5%		
Median Speed:	21.7 MPH			15th Percentile:	15.1 MPH
Modal Speed:	22.5 MPH			90th Percentile:	29.5 MPH
				95th Percentile:	32.2 MPH

Daily Southbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.4 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	26.6 MPH
Mean Speed:	19.9 MPH	Percent in Ten Mile Pace:	60.7%		
Median Speed:	20.2 MPH			15th Percentile:	12.9 MPH
Modal Speed:	22.5 MPH			90th Percentile:	28.0 MPH
				95th Percentile:	29.5 MPH

Daily Southbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.2 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.7 MPH
Mean Speed:	18.6 MPH	Percent in Ten Mile Pace:	63.5%		
Median Speed:	18.7 MPH			15th Percentile:	11.5 MPH
Modal Speed:	17.5 MPH			90th Percentile:	26.5 MPH
				95th Percentile:	28.7 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.0 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	27.3 MPH
Mean Speed:	21.1 MPH	Percent in Ten Mile Pace:	62.6%		
Median Speed:	21.5 MPH			15th Percentile:	15.5 MPH
Modal Speed:	22.5 MPH			90th Percentile:	28.4 MPH
				95th Percentile:	29.6 MPH

Daily Northbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.3 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	26.0 MPH
Mean Speed:	19.6 MPH	Percent in Ten Mile Pace:	62.0%		
Median Speed:	19.9 MPH			15th Percentile:	12.5 MPH
Modal Speed:	17.5 MPH			90th Percentile:	27.6 MPH
				95th Percentile:	29.3 MPH

Daily Northbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	5.8 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	25.4 MPH
Mean Speed:	19.5 MPH	Percent in Ten Mile Pace:	67.4%		
Median Speed:	19.4 MPH			15th Percentile:	14.2 MPH
Modal Speed:	17.5 MPH			90th Percentile:	27.0 MPH
				95th Percentile:	28.7 MPH

Daily Total Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.5 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	28.0 MPH
Mean Speed:	21.3 MPH	Percent in Ten Mile Pace:	58.9%		
Median Speed:	21.6 MPH			15th Percentile:	15.3 MPH
Modal Speed:	22.5 MPH			90th Percentile:	29.1 MPH
				95th Percentile:	31.2 MPH

Daily Total Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.4 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	26.4 MPH
Mean Speed:	19.8 MPH	Percent in Ten Mile Pace:	61.2%		
Median Speed:	20.1 MPH			15th Percentile:	12.8 MPH
Modal Speed:	22.5 MPH			90th Percentile:	27.9 MPH
				95th Percentile:	29.5 MPH

Daily Total Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Beachcomber Street between Mindoro Street and Luzon Street
Posted Speed: 25

Standard Deviation:	6.0 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	25.0 MPH
Mean Speed:	19.0 MPH	Percent in Ten Mile Pace:	65.1%		
Median Speed:	19.0 MPH			15th Percentile:	12.5 MPH
Modal Speed:	17.5 MPH			90th Percentile:	26.8 MPH
				95th Percentile:	28.7 MPH

Daily Southbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	6.0 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	25.1 MPH
Mean Speed:	19.4 MPH	Percent in Ten Mile Pace:	66.0%		
Median Speed:	19.8 MPH			15th Percentile:	12.9 MPH
Modal Speed:	22.5 MPH			90th Percentile:	26.9 MPH
				95th Percentile:	28.8 MPH

Daily Southbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	5.7 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.7 MPH
Mean Speed:	19.3 MPH	Percent in Ten Mile Pace:	70.4%		
Median Speed:	19.4 MPH			15th Percentile:	13.9 MPH
Modal Speed:	17.5 MPH			90th Percentile:	26.2 MPH
				95th Percentile:	28.3 MPH

Daily Southbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	6.1 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.3 MPH
Mean Speed:	18.2 MPH	Percent in Ten Mile Pace:	64.6%		
Median Speed:	18.2 MPH			15th Percentile:	11.2 MPH
Modal Speed:	17.5 MPH			90th Percentile:	25.7 MPH
				95th Percentile:	28.0 MPH

Daily Northbound Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	5.8 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	26.9 MPH
Mean Speed:	20.8 MPH	Percent in Ten Mile Pace:	65.1%		
Median Speed:	21.1 MPH			15th Percentile:	15.4 MPH
Modal Speed:	22.5 MPH			90th Percentile:	28.2 MPH
				95th Percentile:	29.4 MPH

Daily Northbound Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	5.5 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	27.0 MPH
Mean Speed:	21.4 MPH	Percent in Ten Mile Pace:	68.9%		
Median Speed:	21.5 MPH			15th Percentile:	16.2 MPH
Modal Speed:	22.5 MPH			90th Percentile:	28.2 MPH
				95th Percentile:	29.4 MPH

Daily Northbound Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	6.2 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.4 MPH
Mean Speed:	18.5 MPH	Percent in Ten Mile Pace:	64.2%		
Median Speed:	18.6 MPH			15th Percentile:	11.1 MPH
Modal Speed:	17.5 MPH			90th Percentile:	25.9 MPH
				95th Percentile:	28.4 MPH

Daily Total Speeds (MPH)

Study Date: Thursday, 03/17/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	6.0 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	26.3 MPH
Mean Speed:	20.2 MPH	Percent in Ten Mile Pace:	65.5%		
Median Speed:	20.6 MPH			15th Percentile:	15.0 MPH
Modal Speed:	22.5 MPH			90th Percentile:	27.8 MPH
				95th Percentile:	29.2 MPH

Daily Total Speeds (MPH)

Study Date: Friday, 03/18/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	5.7 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	25.9 MPH
Mean Speed:	20.3 MPH	Percent in Ten Mile Pace:	69.7%		
Median Speed:	20.4 MPH			15th Percentile:	15.4 MPH
Modal Speed:	22.5 MPH			90th Percentile:	27.5 MPH
				95th Percentile:	29.0 MPH

Daily Total Speeds (MPH)

Study Date: Saturday, 03/19/2016
Unit ID:
Location: Greenwood Avenue between Elena Street and San Joaquin Street
Posted Speed: 25

Standard Deviation:	6.1 MPH	Ten Mile Pace:	15 to 24 MPH	85th Percentile:	24.4 MPH
Mean Speed:	18.4 MPH	Percent in Ten Mile Pace:	64.4%		
Median Speed:	18.4 MPH			15th Percentile:	11.3 MPH
Modal Speed:	17.5 MPH			90th Percentile:	25.9 MPH
				95th Percentile:	28.3 MPH

Appendix D3: LOS Calculation Sheets



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	47	161	107	48	685	266	60	722	8
v/c Ratio	0.11	0.14	0.56	0.27	0.21	0.49	0.36	0.26	0.51	0.01
Control Delay	31.8	0.9	38.1	3.9	31.5	18.2	8.9	31.6	18.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	0.9	38.1	3.9	31.5	18.2	8.9	31.6	18.3	0.0
Queue Length 50th (ft)	9	0	63	0	18	127	30	23	134	0
Queue Length 95th (ft)	33	0	#173	17	53	187	87	62	199	0
Internal Link Dist (ft)	656		50			1199			1214	
Turn Bay Length (ft)		70			500		90	450		80
Base Capacity (vph)	995	935	290	393	288	1858	912	288	1858	909
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.05	0.56	0.27	0.17	0.37	0.29	0.21	0.39	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	15	43	128	18	97	44	623	242	55	657	7
Future Volume (veh/h)	7	15	43	128	18	97	44	623	242	55	657	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	8	16	47	141	20	107	48	685	266	60	722	8
Adj No. of Lanes	0	1	1	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	29	59	76	196	28	199	67	1280	573	78	1300	582
Arrive On Green	0.05	0.05	0.05	0.12	0.12	0.12	0.04	0.36	0.36	0.04	0.36	0.36
Sat Flow, veh/h	617	1234	1599	1578	224	1599	1792	3574	1599	1792	3574	1599
Grp Volume(v), veh/h	24	0	47	161	0	107	48	685	266	60	722	8
Grp Sat Flow(s),veh/h/ln	1850	0	1599	1802	0	1599	1792	1787	1599	1792	1787	1599
Q Serve(g_s), s	0.7	0.0	1.6	4.8	0.0	3.5	1.5	8.6	7.2	1.9	9.1	0.2
Cycle Q Clear(g_c), s	0.7	0.0	1.6	4.8	0.0	3.5	1.5	8.6	7.2	1.9	9.1	0.2
Prop In Lane	0.33		1.00	0.88		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	88	0	76	224	0	199	67	1280	573	78	1300	582
V/C Ratio(X)	0.27	0.00	0.62	0.72	0.00	0.54	0.71	0.54	0.46	0.77	0.56	0.01
Avail Cap(c_a), veh/h	987	0	853	288	0	256	287	1843	824	287	1843	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	26.3	23.7	0.0	23.1	26.8	14.3	13.9	26.6	14.3	11.4
Incr Delay (d2), s/veh	1.6	0.0	7.9	6.0	0.0	2.3	13.1	0.3	0.6	15.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.9	2.8	0.0	1.7	1.0	4.2	3.3	1.2	4.5	0.1
LnGrp Delay(d),s/veh	27.5	0.0	34.1	29.7	0.0	25.4	39.9	14.7	14.5	41.6	14.6	11.4
LnGrp LOS	C		C	C		C	D	B	B	D	B	B
Approach Vol, veh/h		71			268			999			790	
Approach Delay, s/veh		31.9			28.0			15.8			16.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	26.1		8.7	8.1	26.5		13.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	9.0	29.0		30.0	9.0	29.0		9.0
Max Q Clear Time (g_c+I1), s	3.9	10.6		3.6	3.5	11.1		6.8
Green Ext Time (p_c), s	0.0	9.6		0.3	0.0	9.4		0.3

Intersection Summary

HCM 2010 Ctrl Delay		18.2	
HCM 2010 LOS		B	

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	83	86	329	144	0	0	0	0	64	7	26
Future Vol, veh/h	0	83	86	329	144	0	0	0	0	64	7	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	90	93	358	157	0	0	0	0	70	8	28

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	157	0	0	184	0	0				1009	1056	157
Stage 1	-	-	-	-	-	-				872	872	-
Stage 2	-	-	-	-	-	-				137	184	-
Critical Hdwy	4.11	-	-	4.11	-	-				6.41	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-				5.41	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.41	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-				3.509	4.009	3.309
Pot Cap-1 Maneuver	1429	-	-	1397	-	-				267	226	891
Stage 1	-	-	-	-	-	-				411	369	-
Stage 2	-	-	-	-	-	-				892	749	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1429	-	-	1397	-	-				192	0	891
Mov Cap-2 Maneuver	-	-	-	-	-	-				192	0	-
Stage 1	-	-	-	-	-	-				296	0	-
Stage 2	-	-	-	-	-	-				892	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.9	28.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1429	-	-	1397	-	-	192	891
HCM Lane V/C Ratio	-	-	-	0.256	-	-	0.402	0.032
HCM Control Delay (s)	0	-	-	8.5	0	-	35.8	9.2
HCM Lane LOS	A	-	-	A	A	-	E	A
HCM 95th %tile Q(veh)	0	-	-	1	-	-	1.8	0.1

Intersection	
Intersection Delay, s/veh	37.6
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	92	251	37	0	144	262	49	0	77	188	244
Future Vol, veh/h	0	92	251	37	0	144	262	49	0	77	188	244
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	97	264	39	0	152	276	52	0	81	198	257
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	75.8	32	26.4
HCM LOS	F	D	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	29%	0%	24%	100%	0%	23%	0%
Vol Thru, %	71%	0%	66%	0%	84%	77%	0%
Vol Right, %	0%	100%	10%	0%	16%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	244	380	144	311	180	160
LT Vol	77	0	92	144	0	42	0
Through Vol	188	0	251	0	262	138	0
RT Vol	0	244	37	0	49	0	160
Lane Flow Rate	279	257	400	152	327	189	168
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.703	0.587	1	0.396	0.8	0.496	0.402
Departure Headway (Hd)	9.074	8.23	9.046	9.403	8.792	9.415	8.6
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	402	444	404	387	416	387	423
Service Time	6.738	5.893	7.046	7.061	6.45	7.079	6.263
HCM Lane V/C Ratio	0.694	0.579	0.99	0.393	0.786	0.488	0.397
HCM Control Delay	30.5	21.9	75.8	18.1	38.4	21	16.9
HCM Lane LOS	D	C	F	C	E	C	C
HCM 95th-tile Q	5.2	3.7	12.2	1.8	7.1	2.7	1.9

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	42	138	160
Future Vol, veh/h	0	42	138	160
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	44	145	168
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	19.1
HCM LOS	C

Lane

Intersection																
Intersection Delay, s/veh	13.9															
Intersection LOS	B															

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	201	10	43	0	1	7	21	0	29	249	5	0	24	272	180
Future Vol, veh/h	0	201	10	43	0	1	7	21	0	29	249	5	0	24	272	180
Peak Hour Factor	0.92	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.92	0.96	0.96	0.96
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	209	10	45	0	1	7	22	0	30	259	5	0	25	283	188
Number of Lanes	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	14.3	10.3	15.2	13.2
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	10%	0%	95%	0%	3%	8%	0%
Vol Thru, %	90%	0%	5%	0%	24%	92%	0%
Vol Right, %	0%	100%	0%	100%	72%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	278	5	211	43	29	296	180
LT Vol	29	0	201	0	1	24	0
Through Vol	249	0	10	0	7	272	0
RT Vol	0	5	0	43	21	0	180
Lane Flow Rate	290	5	220	45	30	308	188
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.504	0.008	0.435	0.074	0.057	0.516	0.275
Departure Headway (Hd)	6.265	5.5	7.117	5.923	6.821	6.029	5.278
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	573	648	506	603	522	598	679
Service Time	4.021	3.256	4.871	3.676	4.904	3.78	3.028
HCM Lane V/C Ratio	0.506	0.008	0.435	0.075	0.057	0.515	0.277
HCM Control Delay	15.3	8.3	15.3	9.2	10.3	15.1	10
HCM Lane LOS	C	A	C	A	B	C	A
HCM 95th-tile Q	2.8	0	2.2	0.2	0.2	3	1.1

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	589	769	26	374
Demand Flow Rate, veh/h	595	777	26	378
Vehicles Circulating, veh/h	291	87	868	514
Vehicles Exiting, veh/h	601	807	18	350
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	17.4	8.2	8.3	14.8
Approach LOS	C	A	A	B

Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.659	0.341	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	595	512	265	26	378
Cap Entry Lane, veh/h	845	1036	1036	474	676
Entry HV Adj Factor	0.990	0.990	0.989	0.999	0.989
Flow Entry, veh/h	589	507	262	26	374
Cap Entry, veh/h	836	1026	1024	474	669
V/C Ratio	0.704	0.494	0.256	0.055	0.559
Control Delay, s/veh	17.4	9.4	6.0	8.3	14.8
LOS	C	A	A	A	B
95th %tile Queue, veh	6	3	1	0	3

Summary of All Intervals

Run Number	10	3	5	6	8	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	6582	6599	6563	6623	6579	6594
Vehs Exited	6600	6599	6568	6629	6586	6593
Starting Vehs	101	88	95	93	105	96
Ending Vehs	83	88	90	87	98	91
Travel Distance (mi)	2222	2230	2235	2248	2240	2235
Travel Time (hr)	96.0	96.0	98.9	97.4	96.3	96.9
Total Delay (hr)	24.5	24.4	27.1	25.0	24.4	25.1
Total Stops	4632	4617	4656	4614	4628	4630
Fuel Used (gal)	82.1	82.1	82.8	83.0	82.3	82.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	10	3	5	6	8	Avg
Vehs Entered	6582	6599	6563	6623	6579	6594
Vehs Exited	6600	6599	6568	6629	6586	6593
Starting Vehs	101	88	95	93	105	96
Ending Vehs	83	88	90	87	98	91
Travel Distance (mi)	2222	2230	2235	2248	2240	2235
Travel Time (hr)	96.0	96.0	98.9	97.4	96.3	96.9
Total Delay (hr)	24.5	24.4	27.1	25.0	24.4	25.1
Total Stops	4632	4617	4656	4614	4628	4630
Fuel Used (gal)	82.1	82.1	82.8	83.0	82.3	82.5

1: Highway 1 & San Jacinto St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	4.0	0.1	0.0	0.0	2.8	0.3	2.8	3.0	0.1	3.1
Total Del/Veh (s)	25.8	26.3	5.5	25.4	20.9	5.2	28.2	12.6	4.5	27.2	12.1	2.6

1: Highway 1 & San Jacinto St Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	12.7

2: Main St & San Jacinto St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.1	0.2	3.8	0.2	0.2	0.2	0.1	0.2	0.2
Total Del/Veh (s)	0.7	0.6	0.5	4.4	13.2	2.9	11.8	13.9	8.2	11.9	11.5	7.8

2: Main St & San Jacinto St Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	6.7

3: Highway 1 SB Ramps & State Route 41 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.2	0.2	4.1	0.2
Total Del/Veh (s)	0.9	0.3	4.7	3.4	10.4	12.8	2.5	4.0

4: Main St & State Route 41 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.0	0.9	1.2	3.3	0.7	0.6	0.9	0.9	3.4	0.3	0.3	0.3
Total Del/Veh (s)	17.2	18.3	14.7	9.5	16.3	11.3	12.4	14.8	8.6	18.0	18.5	13.2

4: Main St & State Route 41 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	14.3

Morro Bay Circulation Existing PM
SimTraffic Performance Report 5/2/2016

5: Main St & Beach St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	3.8	0.1	0.1	0.1	0.2	0.3	3.6	0.5	0.7	3.4
Total Del/Veh (s)	6.4	6.7	3.3	2.2	6.3	3.4	6.9	7.3	2.9	7.1	7.5	4.1

5: Main St & Beach St Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	6.4

6: Morro Bay Blvd & Quintana Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.5	0.5	0.3	1.0	1.0	3.2	0.1	0.2	0.1	0.3	0.4	0.3
Total Del/Veh (s)	7.8	8.3	7.2	5.2	5.2	3.4	6.8	7.2	4.8	7.8	9.5	6.0

6: Morro Bay Blvd & Quintana Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	6.4

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	12.5

Central Coast Transportation Consulting SimTraffic Report
SimTraffic Performance Report

Intersection: 1: Highway 1 & San Jacinto St

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	55	43	70	56	70	145	108	82	77	154	113	14
Average Queue (ft)	17	18	57	28	28	72	38	28	27	68	35	1
95th Queue (ft)	44	37	81	50	62	127	88	60	59	123	83	6
Link Distance (ft)	684		53	53		1245	1245			1258	1258	
Upstream Blk Time (%)			19	1								
Queuing Penalty (veh)			23	1								
Storage Bay Dist (ft)		70			500			90	450			80
Storage Blk Time (%)	0						1	0			1	
Queuing Penalty (veh)	0						2	1			0	

Intersection: 2: Main St & San Jacinto St

Movement	EB	WB	WB	WB	NB	SB
Directions Served	LTR	L	T	R	LTR	LTR
Maximum Queue (ft)	51	22	56	12	124	104
Average Queue (ft)	9	5	18	3	56	43
95th Queue (ft)	34	20	40	9	107	78
Link Distance (ft)	53		628		952	732
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	1					
Storage Bay Dist (ft)		40		40		
Storage Blk Time (%)		0	2			
Queuing Penalty (veh)		0	0			

Intersection: 3: Highway 1 SB Ramps & State Route 41

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	5	101	70	29
Average Queue (ft)	0	38	30	13
95th Queue (ft)	3	75	57	34
Link Distance (ft)	671	326	749	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Morro Bay Circulation
Queuing and Blocking Report
Existing PM
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Intersection: 4: Main St & State Route 41

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	L	TR	LT	R	LTR
Maximum Queue (ft)	204	76	158	126	116	182
Average Queue (ft)	106	39	69	67	58	87
95th Queue (ft)	185	63	125	102	93	160
Link Distance (ft)	326		925	762		738
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		160			100	
Storage Blk Time (%)			0	1	0	
Queuing Penalty (veh)			0	3	1	

Intersection: 5: Main St & Beach St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	R	LT	R
Maximum Queue (ft)	80	31	32	105	21	118	73
Average Queue (ft)	43	17	14	52	4	61	40
95th Queue (ft)	71	33	32	83	17	94	63
Link Distance (ft)	677		629	575		552	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		180			65		75
Storage Blk Time (%)				3		2	0
Queuing Penalty (veh)				0		3	1

Intersection: 6: Morro Bay Blvd & Quintana Rd

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	TR	LTR	LTR
Maximum Queue (ft)	182	89	40	45	130
Average Queue (ft)	69	26	4	18	59
95th Queue (ft)	139	67	22	44	109
Link Distance (ft)	768	692		189	622
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			130		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 36

Central Coast Transportation Consulting
SimTraffic Report
Queuing and Blocking Report

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	62	106	82	46	770	147	49	709	11
v/c Ratio	0.16	0.18	0.40	0.22	0.20	0.46	0.18	0.21	0.42	0.01
Control Delay	32.3	1.2	34.8	1.3	32.5	18.6	3.3	32.6	18.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	1.2	34.8	1.3	32.5	18.6	3.3	32.6	18.1	0.0
Queue Length 50th (ft)	15	0	42	0	18	148	0	19	133	0
Queue Length 95th (ft)	45	0	100	0	52	218	29	54	198	0
Internal Link Dist (ft)	656		50			1199			1214	
Turn Bay Length (ft)		70			500		90	450		80
Base Capacity (vph)	963	914	302	406	300	1934	941	300	1934	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.07	0.35	0.20	0.15	0.40	0.16	0.16	0.37	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	22	61	91	13	80	45	755	144	48	695	11
Future Volume (veh/h)	15	22	61	91	13	80	45	755	144	48	695	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	15	22	62	93	13	82	46	770	147	49	709	11
Adj No. of Lanes	0	1	1	0	1	1	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	47	69	101	146	20	148	66	1336	598	68	1342	600
Arrive On Green	0.06	0.06	0.06	0.09	0.09	0.09	0.04	0.37	0.37	0.04	0.38	0.38
Sat Flow, veh/h	747	1096	1599	1581	221	1599	1792	3574	1599	1792	3574	1599
Grp Volume(v), veh/h	37	0	62	106	0	82	46	770	147	49	709	11
Grp Sat Flow(s),veh/h/ln	1844	0	1599	1802	0	1599	1792	1787	1599	1792	1787	1599
Q Serve(g_s), s	1.1	0.0	2.1	3.1	0.0	2.7	1.4	9.5	3.5	1.5	8.6	0.2
Cycle Q Clear(g_c), s	1.1	0.0	2.1	3.1	0.0	2.7	1.4	9.5	3.5	1.5	8.6	0.2
Prop In Lane	0.41		1.00	0.88		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	117	0	101	166	0	148	66	1336	598	68	1342	600
V/C Ratio(X)	0.32	0.00	0.61	0.64	0.00	0.56	0.70	0.58	0.25	0.72	0.53	0.02
Avail Cap(c_a), veh/h	930	0	807	292	0	259	290	1867	835	290	1867	835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	25.3	24.3	0.0	24.1	26.4	13.9	12.0	26.4	13.5	10.9
Incr Delay (d2), s/veh	1.5	0.0	5.9	4.0	0.0	3.2	12.7	0.4	0.2	13.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.1	1.7	0.0	1.3	0.9	4.8	1.6	1.0	4.3	0.1
LnGrp Delay(d),s/veh	26.4	0.0	31.2	28.3	0.0	27.3	39.2	14.3	12.2	39.4	13.8	10.9
LnGrp LOS	C		C	C		C	D	B	B	D	B	B
Approach Vol, veh/h		99			188			963			769	
Approach Delay, s/veh		29.4			27.9			15.1			15.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	26.7		9.5	8.0	26.8		11.1
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	9.0	29.0		28.0	9.0	29.0		9.0
Max Q Clear Time (g_c+I1), s	3.5	11.5		4.1	3.4	10.6		5.1
Green Ext Time (p_c), s	0.0	9.2		0.4	0.0	9.5		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		17.1
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	85	81	262	108	0	0	0	0	69	11	44
Future Vol, veh/h	0	85	81	262	108	0	0	0	0	69	11	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	89	85	276	114	0	0	0	0	73	12	46

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	114	0	0	175	0	0				797	840	114
Stage 1	-	-	-	-	-	-				665	665	-
Stage 2	-	-	-	-	-	-				132	175	-
Critical Hdwy	4.12	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	1475	-	-	1401	-	-				356	302	939
Stage 1	-	-	-	-	-	-				511	458	-
Stage 2	-	-	-	-	-	-				894	754	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1475	-	-	1401	-	-				281	0	939
Mov Cap-2 Maneuver	-	-	-	-	-	-				281	0	-
Stage 1	-	-	-	-	-	-				404	0	-
Stage 2	-	-	-	-	-	-				894	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.8	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1475	-	-	1401	-	-	281	939
HCM Lane V/C Ratio	-	-	-	0.197	-	-	0.3	0.049
HCM Control Delay (s)	0	-	-	8.2	0	-	23.2	9
HCM Lane LOS	A	-	-	A	A	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.7	-	-	1.2	0.2

Intersection	
Intersection Delay, s/veh	28.3
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	53	227	55	0	230	287	62	0	72	158	202
Future Vol, veh/h	0	53	227	55	0	230	287	62	0	72	158	202
Peak Hour Factor	0.95	0.96	0.96	0.96	0.95	0.96	0.96	0.96	0.95	0.96	0.96	0.96
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	55	236	57	0	240	299	65	0	75	165	210
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	40.5	32.1	20.5
HCM LOS	E	D	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	31%	0%	16%	100%	0%	33%	0%
Vol Thru, %	69%	0%	68%	0%	82%	67%	0%
Vol Right, %	0%	100%	16%	0%	18%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	230	202	335	230	349	171	95
LT Vol	72	0	53	230	0	57	0
Through Vol	158	0	227	0	287	114	0
RT Vol	0	202	55	0	62	0	95
Lane Flow Rate	240	210	349	240	364	178	99
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.586	0.462	0.822	0.581	0.817	0.456	0.229
Departure Headway (Hd)	8.801	7.909	8.483	8.735	8.089	9.219	8.313
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	410	457	426	414	447	392	432
Service Time	6.545	5.652	6.527	6.48	5.834	6.965	6.058
HCM Lane V/C Ratio	0.585	0.46	0.819	0.58	0.814	0.454	0.229
HCM Control Delay	23.3	17.3	40.5	23	38.1	19.5	13.5
HCM Lane LOS	C	C	E	C	E	C	B
HCM 95th-tile Q	3.6	2.4	7.6	3.6	7.6	2.3	0.9

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	57	114	95
Future Vol, veh/h	0	57	114	95
Peak Hour Factor	0.95	0.96	0.96	0.96
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	59	119	99
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17.4
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	23.9
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	249	28	105	0	2	15	22	0	63	263	12	0	18	318	286
Future Vol, veh/h	0	249	28	105	0	2	15	22	0	63	263	12	0	18	318	286
Peak Hour Factor	0.95	0.90	0.90	0.90	0.95	0.90	0.90	0.90	0.95	0.90	0.90	0.90	0.95	0.90	0.90	0.90
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	277	31	117	0	2	17	24	0	70	292	13	0	20	353	318
Number of Lanes	0	0	1	1	0	0	1	0	0	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	22.4	12.6	29.4	22.5
HCM LOS	C	B	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	19%	0%	90%	0%	5%	5%	0%
Vol Thru, %	81%	0%	10%	0%	38%	95%	0%
Vol Right, %	0%	100%	0%	100%	56%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	326	12	277	105	39	336	286
LT Vol	63	0	249	0	2	18	0
Through Vol	263	0	28	0	15	318	0
RT Vol	0	12	0	105	22	0	286
Lane Flow Rate	362	13	308	117	43	373	318
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.756	0.025	0.685	0.222	0.103	0.736	0.561
Departure Headway (Hd)	7.518	6.699	8.018	6.84	8.54	7.098	6.353
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	482	534	452	525	419	508	569
Service Time	5.265	4.446	5.762	4.583	6.613	4.843	4.096
HCM Lane V/C Ratio	0.751	0.024	0.681	0.223	0.103	0.734	0.559
HCM Control Delay	30.1	9.6	26.5	11.5	12.6	27.2	17
HCM Lane LOS	D	A	D	B	B	D	C
HCM 95th-tile Q	6.4	0.1	5.1	0.8	0.3	6.1	3.4

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	497	669	21	399
Demand Flow Rate, veh/h	507	682	21	407
Vehicles Circulating, veh/h	273	78	759	432
Vehicles Exiting, veh/h	566	702	20	328
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	13.2	7.2	7.3	13.8
Approach LOS	B	A	A	B

Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.625	0.375	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	507	426	256	21	407
Cap Entry Lane, veh/h	860	1045	1045	529	734
Entry HV Adj Factor	0.981	0.981	0.980	0.996	0.980
Flow Entry, veh/h	497	418	251	21	399
Cap Entry, veh/h	844	1025	1025	527	719
V/C Ratio	0.590	0.408	0.245	0.040	0.555
Control Delay, s/veh	13.2	7.9	5.9	7.3	13.8
LOS	B	A	A	A	B
95th %tile Queue, veh	4	2	1	0	3

Summary of All Intervals

Run Number	1	4	6	7	8	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	6779	6849	6836	6810	6857	6828
Vehs Exited	6771	6868	6817	6826	6861	6829
Starting Vehs	86	117	89	95	94	96
Ending Vehs	94	98	108	79	90	90
Travel Distance (mi)	2275	2321	2288	2289	2303	2295
Travel Time (hr)	97.0	99.1	97.5	96.7	97.5	97.6
Total Delay (hr)	23.8	24.9	24.0	23.1	23.5	23.9
Total Stops	4770	4755	4722	4669	4711	4725
Fuel Used (gal)	83.1	84.5	83.4	83.2	83.7	83.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	4	6	7	8	Avg
Vehs Entered	6779	6849	6836	6810	6857	6828
Vehs Exited	6771	6868	6817	6826	6861	6829
Starting Vehs	86	117	89	95	94	96
Ending Vehs	94	98	108	79	90	90
Travel Distance (mi)	2275	2321	2288	2289	2303	2295
Travel Time (hr)	97.0	99.1	97.5	96.7	97.5	97.6
Total Delay (hr)	23.8	24.9	24.0	23.1	23.5	23.9
Total Stops	4770	4755	4722	4669	4711	4725
Fuel Used (gal)	83.1	84.5	83.4	83.2	83.7	83.6

1: Highway 1 & San Jacinto St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.3	3.9	0.0	0.0	0.0	2.6	0.3	2.7	2.9	0.2	2.9
Total Del/Veh (s)	28.0	24.9	5.9	22.3	12.2	5.4	28.4	12.3	3.7	29.1	12.5	3.8

1: Highway 1 & San Jacinto St Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	12.6

2: Main St & San Jacinto St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.1	0.2	4.1	0.2	0.2	0.2	0.1	0.1	0.1
Total Del/Veh (s)	0.6	0.7	0.5	4.4	9.1	2.2	7.3	9.8	3.7	5.6	10.0	4.3

2: Main St & San Jacinto St Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	5.0

3: Highway 1 SB Ramps & State Route 41 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.3	0.2	4.0	0.3
Total Del/Veh (s)	0.8	0.3	4.7	2.8	8.3	10.6	2.6	3.5

4: Main St & State Route 41 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	0.2	3.3	0.9	0.8	0.8	0.8	3.5	0.3	0.2	0.2
Total Del/Veh (s)	11.7	13.9	9.3	10.4	15.2	9.5	11.6	14.1	7.1	10.8	13.8	7.8

4: Main St & State Route 41 Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	11.8

5: Main St & Beach St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.5	0.5	3.5	0.1	0.1	0.1	0.4	0.3	3.7	1.0	1.0	3.4
Total Del/Veh (s)	8.8	10.0	4.1	7.0	7.2	3.9	8.6	8.6	3.1	9.9	9.4	5.2

5: Main St & Beach St Performance by movement

Movement	All
Denied Del/Veh (s)	1.4
Total Del/Veh (s)	7.7

6: Morro Bay Blvd & Quintana Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.4	0.4	0.9	1.0	3.2	0.1	0.1	0.1	0.3	0.1	0.3
Total Del/Veh (s)	6.1	6.8	5.2	3.9	5.0	3.3	6.6	7.4	4.9	7.2	6.7	5.7

6: Morro Bay Blvd & Quintana Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	5.7

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	11.4

Intersection: 1: Highway 1 & San Jacinto St

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	47	66	69	52	66	158	132	59	72	147	122	16
Average Queue (ft)	20	22	47	24	27	78	43	19	25	72	38	1
95th Queue (ft)	44	45	79	46	56	138	91	43	58	131	89	8
Link Distance (ft)	684		53	53		1245	1245			1258	1258	
Upstream Blk Time (%)			7	0								
Queuing Penalty (veh)			7	0								
Storage Bay Dist (ft)		70			500			90	450			80
Storage Blk Time (%)		0					1				1	
Queuing Penalty (veh)		0					1				0	

Intersection: 2: Main St & San Jacinto St

Movement	EB	WB	WB	WB	NB	SB
Directions Served	LTR	L	T	R	LTR	LTR
Maximum Queue (ft)	49	23	39	12	87	83
Average Queue (ft)	5	6	15	3	42	35
95th Queue (ft)	26	21	31	10	69	59
Link Distance (ft)	53		628		952	732
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)		40		40		
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			

Intersection: 3: Highway 1 SB Ramps & State Route 41

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	3	65	70	40
Average Queue (ft)	0	31	32	22
95th Queue (ft)	3	63	55	41
Link Distance (ft)	671	326	749	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Main St & State Route 41

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	L	TR	LT	R	LTR
Maximum Queue (ft)	155	98	154	121	90	115
Average Queue (ft)	78	50	68	63	49	60
95th Queue (ft)	129	84	117	102	76	96
Link Distance (ft)	326		925	762		738
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		160			100	
Storage Blk Time (%)			0	1	0	
Queuing Penalty (veh)			0	2	0	

Intersection: 5: Main St & Beach St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	R	LT	R
Maximum Queue (ft)	141	65	41	113	25	169	131
Average Queue (ft)	61	26	16	60	8	70	56
95th Queue (ft)	107	47	35	95	25	120	91
Link Distance (ft)	677		629	575		552	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		180			65		75
Storage Blk Time (%)	0			5		5	1
Queuing Penalty (veh)	0			1		15	3

Intersection: 6: Morro Bay Blvd & Quintana Rd

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	TR	LTR	LTR
Maximum Queue (ft)	137	74	22	44	148
Average Queue (ft)	59	23	1	14	54
95th Queue (ft)	106	62	12	40	115
Link Distance (ft)	768	692		189	622
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			130		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 30

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Embarcadero Direction Northbound Date 4/26/2016

Limits .000' South of Pacific Street to 1000' North of Beach Stree Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	1000' South of Pacific Street	Pacific Street	0.05	3.28	C	2834.99	1.13	A	2.54	B	#DIV/0!	N/A
2	Pacific Street	Beach Street	0.08	3.72	D	1574.98	1.32	A	2.86	C	#DIV/0!	N/A
3	Beach Street	1000' North of Beach Street	0.10	3.28	C	#DIV/0!	2.10	#DIV/0!	2.73	B	#DIV/0!	N/A
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Embarcadero Direction Southbound Date 4/26/2016

Limits .000' South of Pacific Street to 1000' North of Beach Stree Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	1000' South of Pacific Street	Pacific Street	0.06	3.28	C	4094.99	1.12	A	2.68	B	#DIV/0!	N/A
2	Pacific Street	Beach Street	0.07	3.72	D	3149.99	1.16	A	2.74	B	#DIV/0!	N/A
3	Beach Street	1000' North of Beach Street	0.10	3.02	C	4094.99	1.51	A	2.76	C	#DIV/0!	N/A
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Main Street Direction Northbound Date 4/26/2016

Limits Radcliff Avenue to Highway 1 Southbound Ramps Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Radcliff Avenue	Highway 1 Southbound Ramps	0.17	3.28	C	944.96	2.56	B	2.34	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Main Street Direction Southbound Date 4/26/2016

Limits Radcliff Avenue to Highway 1 Southbound Ramps Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Radcliff Avenue	Highway 1 Southbound Ramps	0.23	3.02	C	#DIV/0!	3.79	#DIV/0!	2.48	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Morro Bay Boulevard | Direction: Eastbound | Date: 4/26/2016

Limits: Quintana Road to Harbor Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Quintana Road	Harbor Street	0.24	3.62	D	4724.99	2.37	B	2.43	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Morro Bay Boulevard | Direction: Westbound | Date: 4/26/2016

Limits: Quintana Road to Harbor Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Quintana Road	Harbor Street	0.28	3.62	D	4724.99	2.53	B	2.50	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street State Route 41 Direction Eastbound Date 4/26/2016

Limits Main Street to Hill Street Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Main Street	Hill Street	0.23	3.16	C	#DIV/0!	3.39	#DIV/0!	0.75	A	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street State Route 41 Direction Westbound Date 4/26/2016

Limits Main Street to Hill Street Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Main Street	Hill Street	0.22	3.16	C	#DIV/0!	3.32	#DIV/0!	0.71	A	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Embarcadero Direction Northbound Date 4/26/2016

Limits .000' South of Pacific Street to 1000' North of Beach Stree Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	1000' South of Pacific Street	Pacific Street	0.07	3.28	C	2834.99	1.32	A	3.12	C	#DIV/0!	N/A
2	Pacific Street	Beach Street	0.09	3.72	D	1574.98	1.51	A	3.38	C	#DIV/0!	N/A
3	Beach Street	1000' North of Beach Street	0.18	3.28	C	#DIV/0!	2.48	#DIV/0!	3.02	C	#DIV/0!	N/A
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street Embarcadero Direction Southbound Date 4/26/2016

Limits .000' South of Pacific Street to 1000' North of Beach Stree Analyst KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	1000' South of Pacific Street	Pacific Street	0.07	3.28	C	4094.99	1.27	A	3.12	C	#DIV/0!	N/A
2	Pacific Street	Beach Street	0.10	3.72	D	3149.99	1.43	A	3.46	C	#DIV/0!	N/A
3	Beach Street	1000' North of Beach Street	0.15	3.02	C	4094.99	1.77	A	2.97	C	#DIV/0!	N/A
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Main Street | Direction: Northbound | Date: 4/26/2016

Limits: Radcliff Avenue to Highway 1 Southbound Ramps | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Radcliff Avenue	Highway 1 Southbound Ramps	0.25	3.28	C	944.96	3.04	C	2.58	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Main Street | Direction: Southbound | Date: 4/26/2016

Limits: Radcliff Avenue to Highway 1 Southbound Ramps | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Radcliff Avenue	Highway 1 Southbound Ramps	0.24	3.02	C	#DIV/0!	3.94	#DIV/0!	2.55	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Morro Bay Boulevard | Direction: Eastbound | Date: 4/26/2016

Limits: Quintana Road to Harbor Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Quintana Road	Harbor Street	0.22	3.62	D	4724.99	2.27	B	2.38	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: Morro Bay Boulevard | Direction: Westbound | Date: 4/26/2016

Limits: Quintana Road to Harbor Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Quintana Road	Harbor Street	0.26	3.62	D	4724.99	2.47	B	2.47	B	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: State Route 41 | Direction: Eastbound | Date: 4/26/2016

Limits: Main Street to Hill Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Main Street	Hill Street	0.21	3.16	C	#DIV/0!	3.31	#DIV/0!	0.71	A	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: State Route 41 | Direction: Westbound | Date: 4/26/2016

Limits: Main Street to Hill Street | Analyst: KP

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Main Street	Hill Street	0.26	3.16	C	#DIV/0!	3.56	#DIV/0!	0.82	A	#DIV/0!	N/A
2												
3												
4												
5												

Note:
1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)
Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

Appendix D4: Model Validation Results

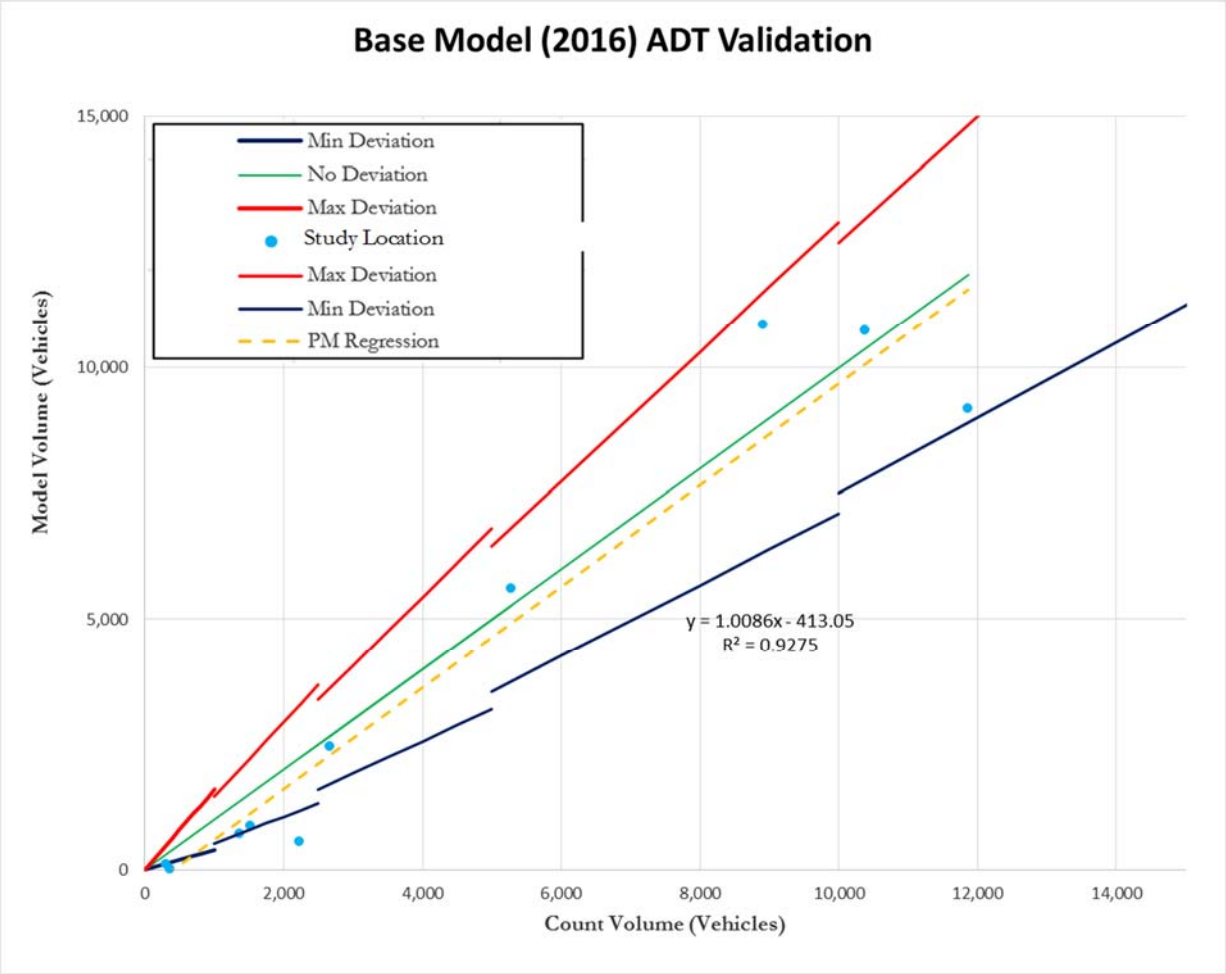

Table 1: Model Validation			
Validation Item	**Criterion for Acceptance**	**Model Results**	
		Daily	**PM**
2-way Sum of All Links Counted	Within ± 25%	-6%	-17.5%
% Within Maxium Deviation	At least 75%	77%	83%
Correlation Coefficient	Greater than 88%	98%	90%
% RMSE*	30-40%	18%	34%

Appendix C

AQ-GHG Emissions Data

Morro Bay General Plan

San Luis Obispo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,761.90	1000sqft	109.32	4,761,900.00	0
Government (Civic Center)	174.30	1000sqft	4.00	174,300.00	0
General Light Industry	374.90	1000sqft	8.61	374,900.00	0
Apartments Low Rise	379.00	Dwelling Unit	23.69	379,000.00	1084
Apartments Mid Rise	448.00	Dwelling Unit	11.79	448,000.00	1281
Condo/Townhouse	6.00	Dwelling Unit	0.38	6,000.00	17
Mobile Home Park	8.00	Dwelling Unit	1.01	9,600.00	23
Single Family Housing	91.00	Dwelling Unit	29.55	163,800.00	260
Strip Mall	552.40	1000sqft	12.68	552,400.00	0
Industrial Park	120.40	1000sqft	2.76	120,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Area Coating - SLOAPCD Rule 433 - limits VOC content to 100 g/L for flat coatings and 150 g/L for traffic Marking Coatings

Area Mitigation - Rule 504 prohibits residential wood-burning

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1634	1.6512	0.9878	1.7300e-003	6.2100e-003	0.0834	0.0896	1.6500e-003	0.0777	0.0793	0.0000	156.5566	156.5566	0.0418	0.0000	157.6026
2019	0.4875	4.9089	2.9582	5.2300e-003	0.4441	0.2484	0.6924	0.2386	0.2305	0.4690	0.0000	467.6534	467.6534	0.1291	0.0000	470.8810
2020	0.5690	6.0684	3.5775	6.7500e-003	2.2302	0.2865	2.5167	0.9468	0.2636	1.2104	0.0000	593.7682	593.7682	0.1862	0.0000	598.4237
2021	0.5576	6.0645	4.1110	8.3200e-003	1.4274	0.2593	1.6867	0.5052	0.2385	0.7437	0.0000	731.4642	731.4642	0.2306	0.0000	737.2297
2022	1.4996	12.7086	12.0725	0.0445	3.6214	0.1744	3.7958	0.9398	0.1629	1.1027	0.0000	4,128.0986	4,128.0986	0.2797	0.0000	4,135.0922

Morro Bay General Plan - San Luis Obispo County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	1.7233	13.3124	14.1123	0.0576	3.8958	0.1261	4.0220	1.0502	0.1185	1.1687	0.0000	5,367.4005	5,367.4005	0.2745	0.0000	5,374.2640
2024	1.6374	12.9580	13.3232	0.0568	3.9259	0.1141	4.0400	1.0583	0.1072	1.1654	0.0000	5,298.5404	5,298.5404	0.2704	0.0000	5,305.2991
2025	1.5423	12.4800	12.4719	0.0554	3.9110	0.1009	4.0120	1.0543	0.0948	1.1491	0.0000	5,170.3095	5,170.3095	0.2638	0.0000	5,176.9041
2026	1.4771	12.2144	11.8011	0.0543	3.9111	0.0994	4.0105	1.0543	0.0933	1.1476	0.0000	5,073.4964	5,073.4964	0.2595	0.0000	5,079.9827
2027	1.4126	11.9723	11.1743	0.0533	3.9112	0.0976	4.0088	1.0543	0.0917	1.1460	0.0000	4,986.6178	4,986.6178	0.2552	0.0000	4,992.9986
2028	1.3415	11.7159	10.6113	0.0522	3.8963	0.0953	3.9916	1.0503	0.0895	1.1398	0.0000	4,891.1528	4,891.1528	0.2507	0.0000	4,897.4204
2029	1.2780	11.5576	10.1604	0.0517	3.9114	0.0939	4.0052	1.0544	0.0881	1.1425	0.0000	4,841.1860	4,841.1860	0.2481	0.0000	4,847.3889
2030	1.2044	10.7926	9.7395	0.0515	3.9114	0.0428	3.9542	1.0544	0.0412	1.0956	0.0000	4,821.8629	4,821.8629	0.1876	0.0000	4,826.5522
2031	1.1351	10.6344	9.3345	0.0509	3.9115	0.0414	3.9528	1.0544	0.0399	1.0943	0.0000	4,770.4776	4,770.4776	0.1845	0.0000	4,775.0903
2032	1.0760	10.5290	9.0173	0.0506	3.9265	0.0402	3.9667	1.0585	0.0389	1.0973	0.0000	4,744.8268	4,744.8268	0.1825	0.0000	4,749.3886
2033	1.0156	10.3257	8.6547	0.0498	3.8966	0.0388	3.9353	1.0504	0.0375	1.0879	0.0000	4,671.7274	4,671.7274	0.1789	0.0000	4,676.2006
2034	0.9739	10.2183	8.3940	0.0495	3.8966	0.0378	3.9343	1.0504	0.0366	1.0870	0.0000	4,640.5515	4,640.5515	0.1769	0.0000	4,644.9732
2035	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1734	4,632.1734	0.1747	0.0000	4,636.5410
2036	0.9334	10.1046	8.2328	0.0496	3.9266	0.0296	3.9562	1.0585	0.0284	1.0870	0.0000	4,649.9212	4,649.9212	0.1754	0.0000	4,654.3055
2037	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1734	4,632.1734	0.1747	0.0000	4,636.5410
2038	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1734	4,632.1734	0.1747	0.0000	4,636.5410
2039	0.9263	10.0275	8.1699	0.0492	3.8966	0.0294	3.9260	1.0504	0.0282	1.0787	0.0000	4,614.4256	4,614.4256	0.1740	0.0000	4,618.7765
2040	0.2117	1.5413	2.7124	8.9200e-003	0.4663	0.0163	0.4826	0.1256	0.0162	0.1418	0.0000	811.8100	811.8100	0.0289	0.0000	812.5327

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2041	0.1152	0.2732	1.3361	3.9700e-003	0.4134	7.3200e-003	0.4208	0.1099	7.2500e-003	0.1171	0.0000	351.8201	351.8201	6.6000e-003	0.0000	351.9850
2042	0.0666	0.0950	0.5663	2.6300e-003	0.4213	1.6000e-003	0.4229	0.1120	1.5200e-003	0.1135	0.0000	237.3411	237.3411	2.6500e-003	0.0000	237.4074
Maximum	**1.7233**	**13.3124**	**14.1123**	**0.0576**	**3.9266**	**0.2865**	**4.0400**	**1.0585**	**0.2636**	**1.2104**	**0.0000**	**5,367.4005**	**5,367.4005**	**0.2797**	**0.0000**	**5,374.2640**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1634	1.6512	0.9878	1.7300e-003	6.2100e-003	0.0834	0.0896	1.6500e-003	0.0777	0.0793	0.0000	156.5565	156.5565	0.0418	0.0000	157.6024
2019	0.4875	4.9089	2.9582	5.2300e-003	0.4441	0.2484	0.6924	0.2386	0.2305	0.4690	0.0000	467.6528	467.6528	0.1291	0.0000	470.8804
2020	0.5690	6.0684	3.5775	6.7500e-003	2.2302	0.2865	2.5167	0.9468	0.2636	1.2104	0.0000	593.7675	593.7675	0.1862	0.0000	598.4230
2021	0.5576	6.0644	4.1110	8.3200e-003	1.4274	0.2593	1.6867	0.5052	0.2385	0.7437	0.0000	731.4634	731.4634	0.2306	0.0000	737.2288
2022	1.4996	12.7086	12.0725	0.0445	3.6214	0.1744	3.7958	0.9398	0.1629	1.1027	0.0000	4,128.0981	4,128.0981	0.2797	0.0000	4,135.0917
2023	1.7233	13.3124	14.1123	0.0576	3.8958	0.1261	4.0220	1.0502	0.1185	1.1687	0.0000	5,367.4001	5,367.4001	0.2745	0.0000	5,374.2637
2024	1.6374	12.9580	13.3232	0.0568	3.9259	0.1141	4.0400	1.0583	0.1072	1.1654	0.0000	5,298.5400	5,298.5400	0.2704	0.0000	5,305.2987
2025	1.5423	12.4800	12.4719	0.0554	3.9110	0.1009	4.0120	1.0543	0.0948	1.1491	0.0000	5,170.3091	5,170.3091	0.2638	0.0000	5,176.9038
2026	1.4771	12.2144	11.8011	0.0543	3.9111	0.0994	4.0105	1.0543	0.0933	1.1476	0.0000	5,073.4961	5,073.4961	0.2595	0.0000	5,079.9823

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2027	1.4126	11.9723	11.1743	0.0533	3.9112	0.0976	4.0088	1.0543	0.0917	1.1460	0.0000	4,986.6174	4,986.6174	0.2552	0.0000	4,992.9983
2028	1.3415	11.7159	10.6113	0.0522	3.8963	0.0953	3.9916	1.0503	0.0895	1.1398	0.0000	4,891.1524	4,891.1524	0.2507	0.0000	4,897.4201
2029	1.2780	11.5576	10.1604	0.0517	3.9114	0.0939	4.0052	1.0544	0.0881	1.1425	0.0000	4,841.1856	4,841.1856	0.2481	0.0000	4,847.3886
2030	1.2044	10.7926	9.7395	0.0515	3.9114	0.0428	3.9542	1.0544	0.0412	1.0956	0.0000	4,821.8625	4,821.8625	0.1876	0.0000	4,826.5518
2031	1.1351	10.6344	9.3345	0.0509	3.9115	0.0414	3.9528	1.0544	0.0399	1.0943	0.0000	4,770.4772	4,770.4772	0.1845	0.0000	4,775.0899
2032	1.0760	10.5290	9.0173	0.0506	3.9265	0.0402	3.9667	1.0585	0.0389	1.0973	0.0000	4,744.8264	4,744.8264	0.1825	0.0000	4,749.3882
2033	1.0156	10.3257	8.6547	0.0498	3.8966	0.0388	3.9353	1.0504	0.0375	1.0879	0.0000	4,671.7270	4,671.7270	0.1789	0.0000	4,676.2002
2034	0.9739	10.2183	8.3940	0.0495	3.8966	0.0378	3.9343	1.0504	0.0366	1.0870	0.0000	4,640.5511	4,640.5511	0.1769	0.0000	4,644.9728
2035	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1730	4,632.1730	0.1747	0.0000	4,636.5406
2036	0.9334	10.1046	8.2328	0.0496	3.9266	0.0296	3.9562	1.0585	0.0284	1.0870	0.0000	4,649.9208	4,649.9208	0.1754	0.0000	4,654.3051
2037	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1730	4,632.1730	0.1747	0.0000	4,636.5406
2038	0.9299	10.0660	8.2013	0.0494	3.9116	0.0295	3.9411	1.0545	0.0283	1.0828	0.0000	4,632.1730	4,632.1730	0.1747	0.0000	4,636.5406
2039	0.9263	10.0275	8.1699	0.0492	3.8966	0.0294	3.9260	1.0504	0.0282	1.0787	0.0000	4,614.4252	4,614.4252	0.1740	0.0000	4,618.7761
2040	0.2117	1.5413	2.7124	8.9200e-003	0.4663	0.0163	0.4826	0.1256	0.0162	0.1418	0.0000	811.8096	811.8096	0.0289	0.0000	812.5323
2041	0.1152	0.2732	1.3361	3.9700e-003	0.4134	7.3200e-003	0.4208	0.1099	7.2500e-003	0.1171	0.0000	351.8199	351.8199	6.6000e-003	0.0000	351.9849
2042	0.0666	0.0950	0.5663	2.6300e-003	0.4213	1.6000e-003	0.4229	0.1120	1.5200e-003	0.1135	0.0000	237.3411	237.3411	2.6500e-003	0.0000	237.4074
Maximum	**1.7233**	**13.3124**	**14.1123**	**0.0576**	**3.9266**	**0.2865**	**4.0400**	**1.0585**	**0.2636**	**1.2104**	**0.0000**	**5,367.4001**	**5,367.4001**	**0.2797**	**0.0000**	**5,374.2637**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-3-2018**	**12-2-2018**	1.3716	1.3716
2	**12-3-2018**	**3-2-2019**	1.2965	1.2965
3	**3-3-2019**	**6-2-2019**	1.2957	1.2957
4	**6-3-2019**	**9-2-2019**	1.2955	1.2955
5	**9-3-2019**	**12-2-2019**	1.4262	1.4262
6	**12-3-2019**	**3-2-2020**	1.5518	1.5518
7	**3-3-2020**	**6-2-2020**	1.5325	1.5325
8	**6-3-2020**	**9-2-2020**	1.7103	1.7103
9	**9-3-2020**	**12-2-2020**	1.7816	1.7816
10	**12-3-2020**	**3-2-2021**	1.6736	1.6736
11	**3-3-2021**	**6-2-2021**	1.6672	1.6672
12	**6-3-2021**	**9-2-2021**	1.6670	1.6670
13	**9-3-2021**	**12-2-2021**	1.6493	1.6493
14	**12-3-2021**	**3-2-2022**	1.4542	1.4542
15	**3-3-2022**	**6-2-2022**	2.9763	2.9763
16	**6-3-2022**	**9-2-2022**	4.4211	4.4211
17	**9-3-2022**	**12-2-2022**	4.4159	4.4159
18	**12-3-2022**	**3-2-2023**	3.9409	3.9409
19	**3-3-2023**	**6-2-2023**	3.7719	3.7719
20	**6-3-2023**	**9-2-2023**	3.7533	3.7533
21	**9-3-2023**	**12-2-2023**	3.7528	3.7528
22	**12-3-2023**	**3-2-2024**	3.6760	3.6760
23	**3-3-2024**	**6-2-2024**	3.6348	3.6348

24	**6-3-2024**	**9-2-2024**	3.6179	3.6179
25	**9-3-2024**	**12-2-2024**	3.6154	3.6154
26	**12-3-2024**	**3-2-2025**	3.5048	3.5048
27	**3-3-2025**	**6-2-2025**	3.5067	3.5067
28	**6-3-2025**	**9-2-2025**	3.4912	3.4912
29	**9-3-2025**	**12-2-2025**	3.4869	3.4869
30	**12-3-2025**	**3-2-2026**	3.4077	3.4077
31	**3-3-2026**	**6-2-2026**	3.4252	3.4252
32	**6-3-2026**	**9-2-2026**	3.4108	3.4108
33	**9-3-2026**	**12-2-2026**	3.4050	3.4050
34	**12-3-2026**	**3-2-2027**	3.3295	3.3295
35	**3-3-2027**	**6-2-2027**	3.3497	3.3497
36	**6-3-2027**	**9-2-2027**	3.3365	3.3365
37	**9-3-2027**	**12-2-2027**	3.3289	3.3289
38	**12-3-2027**	**3-2-2028**	3.2938	3.2938
39	**3-3-2028**	**6-2-2028**	3.2812	3.2812
40	**6-3-2028**	**9-2-2028**	3.2692	3.2692
41	**9-3-2028**	**12-2-2028**	3.2598	3.2598
42	**12-3-2028**	**3-2-2029**	3.1891	3.1891
43	**3-3-2029**	**6-2-2029**	3.2139	3.2139
44	**6-3-2029**	**9-2-2029**	3.2031	3.2031
45	**9-3-2029**	**12-2-2029**	3.1918	3.1918
46	**12-3-2029**	**3-2-2030**	3.0261	3.0261
47	**3-3-2030**	**6-2-2030**	3.0038	3.0038
48	**6-3-2030**	**9-2-2030**	2.9941	2.9941
49	**9-3-2030**	**12-2-2030**	2.9826	2.9826
50	**12-3-2030**	**3-2-2031**	2.9200	2.9200

51	**3-3-2031**	**6-2-2031**	2.9475	2.9475
52	**6-3-2031**	**9-2-2031**	2.9391	2.9391
53	**9-3-2031**	**12-2-2031**	2.9254	2.9254
54	**12-3-2031**	**3-2-2032**	2.8970	2.8970
55	**3-3-2032**	**6-2-2032**	2.8957	2.8957
56	**6-3-2032**	**9-2-2032**	2.8884	2.8884
57	**9-3-2032**	**12-2-2032**	2.8729	2.8729
58	**12-3-2032**	**3-2-2033**	2.8180	2.8180
59	**3-3-2033**	**6-2-2033**	2.8521	2.8521
60	**6-3-2033**	**9-2-2033**	2.8458	2.8458
61	**9-3-2033**	**12-2-2033**	2.8286	2.8286
62	**12-3-2033**	**3-2-2034**	2.7779	2.7779
63	**3-3-2034**	**6-2-2034**	2.8150	2.8150
64	**6-3-2034**	**9-2-2034**	2.8094	2.8094
65	**9-3-2034**	**12-2-2034**	2.7910	2.7910
66	**12-3-2034**	**3-2-2035**	2.7251	2.7251
67	**3-3-2035**	**6-2-2035**	2.7551	2.7551
68	**6-3-2035**	**9-2-2035**	2.7501	2.7501
69	**9-3-2035**	**12-2-2035**	2.7311	2.7311
70	**12-3-2035**	**3-2-2036**	2.7359	2.7359
71	**3-3-2036**	**6-2-2036**	2.7551	2.7551
72	**6-3-2036**	**9-2-2036**	2.7501	2.7501
73	**9-3-2036**	**12-2-2036**	2.7311	2.7311
74	**12-3-2036**	**3-2-2037**	2.7058	2.7058
75	**3-3-2037**	**6-2-2037**	2.7551	2.7551
76	**6-3-2037**	**9-2-2037**	2.7501	2.7501
77	**9-3-2037**	**12-2-2037**	2.7311	2.7311

78	**12-3-2037**	**3-2-2038**	2.7058	2.7058
79	**3-3-2038**	**6-2-2038**	2.7551	2.7551
80	**6-3-2038**	**9-2-2038**	2.7501	2.7501
81	**9-3-2038**	**12-2-2038**	2.7311	2.7311
82	**12-3-2038**	**3-2-2039**	2.7058	2.7058
83	**3-3-2039**	**6-2-2039**	2.7551	2.7551
84	**6-3-2039**	**9-2-2039**	2.7501	2.7501
85	**9-3-2039**	**12-2-2039**	2.7311	2.7311
86	**12-3-2039**	**3-2-2040**	2.0857	2.0857
87	**3-3-2040**	**6-2-2040**	0.1544	0.1544
88	**6-3-2040**	**9-2-2040**	0.1543	0.1543
89	**9-3-2040**	**12-2-2040**	0.1528	0.1528
90	**12-3-2040**	**3-2-2041**	0.1511	0.1511
91	**3-3-2041**	**6-2-2041**	0.1381	0.1381
92	**6-3-2041**	**9-2-2041**	0.0610	0.0610
93	**9-3-2041**	**12-2-2041**	0.0642	0.0642
94	**12-3-2041**	**3-2-2042**	0.0652	0.0652
95	**3-3-2042**	**6-2-2042**	0.0628	0.0628
96	**6-3-2042**	**9-2-2042**	0.0537	0.0537
		Highest	4.4211	4.4211

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	31.0908	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259
Energy	0.6860	6.2052	5.0094	0.0374		0.4740	0.4740		0.4740	0.4740	0.0000	39,271.8806	39,271.8806	1.5989	0.4284	39,439.5021
Mobile	7.9004	40.1825	90.0697	0.4497	59.0713	0.2028	59.2741	15.7847	0.1886	15.9733	0.0000	41,548.7251	41,548.7251	1.2124	0.0000	41,579.0358
Waste						0.0000	0.0000		0.0000	0.0000	1,443.2130	0.0000	1,443.2130	85.2914	0.0000	3,575.4990
Water						0.0000	0.0000		0.0000	0.0000	348.0770	2,341.3461	2,689.4231	35.8567	0.8661	3,843.9265
Total	**39.6773**	**46.5344**	**107.8106**	**0.4878**	**59.0713**	**0.7475**	**59.8188**	**15.7847**	**0.7333**	**16.5179**	**1,791.2900**	**83,182.8719**	**84,974.1619**	**123.9797**	**1.2944**	**88,459.3893**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	31.0908	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259
Energy	0.6860	6.2052	5.0094	0.0374		0.4740	0.4740		0.4740	0.4740	0.0000	39,271.8806	39,271.8806	1.5989	0.4284	39,439.5021
Mobile	7.9004	40.1825	90.0697	0.4497	59.0713	0.2028	59.2741	15.7847	0.1886	15.9733	0.0000	41,548.7251	41,548.7251	1.2124	0.0000	41,579.0358
Waste						0.0000	0.0000		0.0000	0.0000	1,443.2130	0.0000	1,443.2130	85.2914	0.0000	3,575.4990
Water						0.0000	0.0000		0.0000	0.0000	348.0770	2,341.3461	2,689.4231	35.8567	0.8661	3,843.9265
Total	**39.6773**	**46.5344**	**107.8106**	**0.4878**	**59.0713**	**0.7475**	**59.8188**	**15.7847**	**0.7333**	**16.5179**	**1,791.2900**	**83,182.8719**	**84,974.1619**	**123.9797**	**1.2944**	**88,459.3893**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/3/2018	10/25/2019	5	300	
2	Site Preparation	Site Preparation	10/26/2019	7/3/2020	5	180	
3	Grading	Grading	7/4/2020	4/15/2022	5	465	
4	Building Construction	Building Construction	4/16/2022	2/10/2040	5	4650	
5	Paving	Paving	2/11/2040	5/17/2041	5	330	
6	Architectural Coating	Architectural Coating	5/18/2041	8/22/2042	5	330	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1162.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	2,603.00	1,080.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	521.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1599	1.6479	0.9591	1.6700e-003		0.0834	0.0834		0.0776	0.0776	0.0000	151.0335	151.0335	0.0416	0.0000	152.0738
Total	**0.1599**	**1.6479**	**0.9591**	**1.6700e-003**		**0.0834**	**0.0834**		**0.0776**	**0.0776**	**0.0000**	**151.0335**	**151.0335**	**0.0416**	**0.0000**	**152.0738**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4500e-003	3.3200e-003	0.0288	6.0000e-005	6.2100e-003	4.0000e-005	6.2500e-003	1.6500e-003	4.0000e-005	1.6900e-003	0.0000	5.5231	5.5231	2.3000e-004	0.0000	5.5288
Total	**3.4500e-003**	**3.3200e-003**	**0.0288**	**6.0000e-005**	**6.2100e-003**	**4.0000e-005**	**6.2500e-003**	**1.6500e-003**	**4.0000e-005**	**1.6900e-003**	**0.0000**	**5.5231**	**5.5231**	**2.3000e-004**	**0.0000**	**5.5288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1599	1.6479	0.9591	1.6700e-003		0.0834	0.0834		0.0776	0.0776	0.0000	151.0333	151.0333	0.0416	0.0000	152.0736
Total	**0.1599**	**1.6479**	**0.9591**	**1.6700e-003**		**0.0834**	**0.0834**		**0.0776**	**0.0776**	**0.0000**	**151.0333**	**151.0333**	**0.0416**	**0.0000**	**152.0736**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4500e-003	3.3200e-003	0.0288	6.0000e-005	6.2100e-003	4.0000e-005	6.2500e-003	1.6500e-003	4.0000e-005	1.6900e-003	0.0000	5.5231	5.5231	2.3000e-004	0.0000	5.5288
Total	**3.4500e-003**	**3.3200e-003**	**0.0288**	**6.0000e-005**	**6.2100e-003**	**4.0000e-005**	**6.2500e-003**	**1.6500e-003**	**4.0000e-005**	**1.6900e-003**	**0.0000**	**5.5231**	**5.5231**	**2.3000e-004**	**0.0000**	**5.5288**

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3759	3.8288	2.3604	4.1500e-003		0.1921	0.1921		0.1787	0.1787	0.0000	370.5017	370.5017	0.1031	0.0000	373.0785
Total	**0.3759**	**3.8288**	**2.3604**	**4.1500e-003**		**0.1921**	**0.1921**		**0.1787**	**0.1787**	**0.0000**	**370.5017**	**370.5017**	**0.1031**	**0.0000**	**373.0785**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7100e-003	7.2400e-003	0.0627	1.5000e-004	0.0155	1.0000e-004	0.0156	4.1100e-003	1.0000e-004	4.2000e-003	0.0000	13.3396	13.3396	5.0000e-004	0.0000	13.3520
Total	**7.7100e-003**	**7.2400e-003**	**0.0627**	**1.5000e-004**	**0.0155**	**1.0000e-004**	**0.0156**	**4.1100e-003**	**1.0000e-004**	**4.2000e-003**	**0.0000**	**13.3396**	**13.3396**	**5.0000e-004**	**0.0000**	**13.3520**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3759	3.8288	2.3604	4.1500e-003		0.1921	0.1921		0.1787	0.1787	0.0000	370.5013	370.5013	0.1031	0.0000	373.0780
Total	**0.3759**	**3.8288**	**2.3604**	**4.1500e-003**		**0.1921**	**0.1921**		**0.1787**	**0.1787**	**0.0000**	**370.5013**	**370.5013**	**0.1031**	**0.0000**	**373.0780**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7100e-003	7.2400e-003	0.0627	1.5000e-004	0.0155	1.0000e-004	0.0156	4.1100e-003	1.0000e-004	4.2000e-003	0.0000	13.3396	13.3396	5.0000e-004	0.0000	13.3520
Total	**7.7100e-003**	**7.2400e-003**	**0.0627**	**1.5000e-004**	**0.0155**	**1.0000e-004**	**0.0156**	**4.1100e-003**	**1.0000e-004**	**4.2000e-003**	**0.0000**	**13.3396**	**13.3396**	**5.0000e-004**	**0.0000**	**13.3520**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4246	0.0000	0.4246	0.2334	0.0000	0.2334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1019	1.0710	0.5185	8.9000e-004		0.0562	0.0562		0.0517	0.0517	0.0000	80.2964	80.2964	0.0254	0.0000	80.9315
Total	**0.1019**	**1.0710**	**0.5185**	**8.9000e-004**	**0.4246**	**0.0562**	**0.4807**	**0.2334**	**0.0517**	**0.2851**	**0.0000**	**80.2964**	**80.2964**	**0.0254**	**0.0000**	**80.9315**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0300e-003	1.9100e-003	0.0165	4.0000e-005	4.0700e-003	3.0000e-005	4.1000e-003	1.0800e-003	3.0000e-005	1.1100e-003	0.0000	3.5157	3.5157	1.3000e-004	0.0000	3.5189
Total	**2.0300e-003**	**1.9100e-003**	**0.0165**	**4.0000e-005**	**4.0700e-003**	**3.0000e-005**	**4.1000e-003**	**1.0800e-003**	**3.0000e-005**	**1.1100e-003**	**0.0000**	**3.5157**	**3.5157**	**1.3000e-004**	**0.0000**	**3.5189**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4246	0.0000	0.4246	0.2334	0.0000	0.2334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1019	1.0710	0.5185	8.9000e-004		0.0562	0.0562		0.0517	0.0517	0.0000	80.2963	80.2963	0.0254	0.0000	80.9314
Total	**0.1019**	**1.0710**	**0.5185**	**8.9000e-004**	**0.4246**	**0.0562**	**0.4807**	**0.2334**	**0.0517**	**0.2851**	**0.0000**	**80.2963**	**80.2963**	**0.0254**	**0.0000**	**80.9314**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0300e-003	1.9100e-003	0.0165	4.0000e-005	4.0700e-003	3.0000e-005	4.1000e-003	1.0800e-003	3.0000e-005	1.1100e-003	0.0000	3.5157	3.5157	1.3000e-004	0.0000	3.5189
Total	**2.0300e-003**	**1.9100e-003**	**0.0165**	**4.0000e-005**	**4.0700e-003**	**3.0000e-005**	**4.1000e-003**	**1.0800e-003**	**3.0000e-005**	**1.1100e-003**	**0.0000**	**3.5157**	**3.5157**	**1.3000e-004**	**0.0000**	**3.5189**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2014	0.0000	1.2014	0.6604	0.0000	0.6604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2711	2.8208	1.4307	2.5300e-003		0.1461	0.1461		0.1344	0.1344	0.0000	222.3140	222.3140	0.0719	0.0000	224.1115
Total	**0.2711**	**2.8208**	**1.4307**	**2.5300e-003**	**1.2014**	**0.1461**	**1.3475**	**0.6604**	**0.1344**	**0.7948**	**0.0000**	**222.3140**	**222.3140**	**0.0719**	**0.0000**	**224.1115**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	4.7600e-003	0.0412	1.1000e-004	0.0115	8.0000e-005	0.0116	3.0600e-003	7.0000e-005	3.1300e-003	0.0000	9.6407	9.6407	3.2000e-004	0.0000	9.6487
Total	**5.2300e-003**	**4.7600e-003**	**0.0412**	**1.1000e-004**	**0.0115**	**8.0000e-005**	**0.0116**	**3.0600e-003**	**7.0000e-005**	**3.1300e-003**	**0.0000**	**9.6407**	**9.6407**	**3.2000e-004**	**0.0000**	**9.6487**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2014	0.0000	1.2014	0.6604	0.0000	0.6604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2711	2.8208	1.4307	2.5300e-003		0.1461	0.1461		0.1344	0.1344	0.0000	222.3138	222.3138	0.0719	0.0000	224.1113
Total	**0.2711**	**2.8208**	**1.4307**	**2.5300e-003**	**1.2014**	**0.1461**	**1.3475**	**0.6604**	**0.1344**	**0.7948**	**0.0000**	**222.3138**	**222.3138**	**0.0719**	**0.0000**	**224.1113**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	4.7600e-003	0.0412	1.1000e-004	0.0115	8.0000e-005	0.0116	3.0600e-003	7.0000e-005	3.1300e-003	0.0000	9.6407	9.6407	3.2000e-004	0.0000	9.6487
Total	**5.2300e-003**	**4.7600e-003**	**0.0412**	**1.1000e-004**	**0.0115**	**8.0000e-005**	**0.0116**	**3.0600e-003**	**7.0000e-005**	**3.1300e-003**	**0.0000**	**9.6407**	**9.6407**	**3.2000e-004**	**0.0000**	**9.6487**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0048	0.0000	1.0048	0.2801	0.0000	0.2801	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2870	3.2377	2.0613	4.0000e-003		0.1402	0.1402		0.1290	0.1290	0.0000	351.4237	351.4237	0.1137	0.0000	354.2651
Total	**0.2870**	**3.2377**	**2.0613**	**4.0000e-003**	**1.0048**	**0.1402**	**1.1451**	**0.2801**	**0.1290**	**0.4091**	**0.0000**	**351.4237**	**351.4237**	**0.1137**	**0.0000**	**354.2651**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6400e-003	5.1300e-003	0.0444	1.2000e-004	0.0124	8.0000e-005	0.0125	3.3000e-003	8.0000e-005	3.3800e-003	0.0000	10.3898	10.3898	3.4000e-004	0.0000	10.3983
Total	**5.6400e-003**	**5.1300e-003**	**0.0444**	**1.2000e-004**	**0.0124**	**8.0000e-005**	**0.0125**	**3.3000e-003**	**8.0000e-005**	**3.3800e-003**	**0.0000**	**10.3898**	**10.3898**	**3.4000e-004**	**0.0000**	**10.3983**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0048	0.0000	1.0048	0.2801	0.0000	0.2801	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2870	3.2377	2.0613	4.0000e-003		0.1402	0.1402		0.1290	0.1290	0.0000	351.4233	351.4233	0.1137	0.0000	354.2647
Total	**0.2870**	**3.2377**	**2.0613**	**4.0000e-003**	**1.0048**	**0.1402**	**1.1451**	**0.2801**	**0.1290**	**0.4091**	**0.0000**	**351.4233**	**351.4233**	**0.1137**	**0.0000**	**354.2647**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6400e-003	5.1300e-003	0.0444	1.2000e-004	0.0124	8.0000e-005	0.0125	3.3000e-003	8.0000e-005	3.3800e-003	0.0000	10.3898	10.3898	3.4000e-004	0.0000	10.3983
Total	**5.6400e-003**	**5.1300e-003**	**0.0444**	**1.2000e-004**	**0.0124**	**8.0000e-005**	**0.0125**	**3.3000e-003**	**8.0000e-005**	**3.3800e-003**	**0.0000**	**10.3898**	**10.3898**	**3.4000e-004**	**0.0000**	**10.3983**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.4023	0.0000	1.4023	0.4985	0.0000	0.4985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5470	6.0552	4.0296	8.0900e-003		0.2591	0.2591		0.2384	0.2384	0.0000	711.1595	711.1595	0.2300	0.0000	716.9096
Total	**0.5470**	**6.0552**	**4.0296**	**8.0900e-003**	**1.4023**	**0.2591**	**1.6614**	**0.4985**	**0.2384**	**0.7369**	**0.0000**	**711.1595**	**711.1595**	**0.2300**	**0.0000**	**716.9096**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0106	9.2700e-003	0.0814	2.2000e-004	0.0251	1.6000e-004	0.0253	6.6800e-003	1.5000e-004	6.8200e-003	0.0000	20.3047	20.3047	6.1000e-004	0.0000	20.3201
Total	**0.0106**	**9.2700e-003**	**0.0814**	**2.2000e-004**	**0.0251**	**1.6000e-004**	**0.0253**	**6.6800e-003**	**1.5000e-004**	**6.8200e-003**	**0.0000**	**20.3047**	**20.3047**	**6.1000e-004**	**0.0000**	**20.3201**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.4023	0.0000	1.4023	0.4985	0.0000	0.4985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5470	6.0552	4.0296	8.0900e-003		0.2591	0.2591		0.2384	0.2384	0.0000	711.1587	711.1587	0.2300	0.0000	716.9087
Total	**0.5470**	**6.0552**	**4.0296**	**8.0900e-003**	**1.4023**	**0.2591**	**1.6614**	**0.4985**	**0.2384**	**0.7369**	**0.0000**	**711.1587**	**711.1587**	**0.2300**	**0.0000**	**716.9087**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0106	9.2700e-003	0.0814	2.2000e-004	0.0251	1.6000e-004	0.0253	6.6800e-003	1.5000e-004	6.8200e-003	0.0000	20.3047	20.3047	6.1000e-004	0.0000	20.3201
Total	**0.0106**	**9.2700e-003**	**0.0814**	**2.2000e-004**	**0.0251**	**1.6000e-004**	**0.0253**	**6.6800e-003**	**1.5000e-004**	**6.8200e-003**	**0.0000**	**20.3047**	**20.3047**	**6.1000e-004**	**0.0000**	**20.3201**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8422	0.0000	0.8422	0.1907	0.0000	0.1907	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1359	1.4566	1.0891	2.3300e-003		0.0613	0.0613		0.0564	0.0564	0.0000	204.5048	204.5048	0.0661	0.0000	206.1583
Total	**0.1359**	**1.4566**	**1.0891**	**2.3300e-003**	**0.8422**	**0.0613**	**0.9036**	**0.1907**	**0.0564**	**0.2471**	**0.0000**	**204.5048**	**204.5048**	**0.0661**	**0.0000**	**206.1583**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	2.4000e-003	0.0214	6.0000e-005	7.2200e-003	4.0000e-005	7.2600e-003	1.9200e-003	4.0000e-005	1.9600e-003	0.0000	5.6261	5.6261	1.6000e-004	0.0000	5.6301
Total	**2.8700e-003**	**2.4000e-003**	**0.0214**	**6.0000e-005**	**7.2200e-003**	**4.0000e-005**	**7.2600e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**5.6261**	**5.6261**	**1.6000e-004**	**0.0000**	**5.6301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8422	0.0000	0.8422	0.1907	0.0000	0.1907	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1359	1.4566	1.0891	2.3300e-003		0.0613	0.0613		0.0564	0.0564	0.0000	204.5045	204.5045	0.0661	0.0000	206.1580
Total	**0.1359**	**1.4566**	**1.0891**	**2.3300e-003**	**0.8422**	**0.0613**	**0.9036**	**0.1907**	**0.0564**	**0.2471**	**0.0000**	**204.5045**	**204.5045**	**0.0661**	**0.0000**	**206.1580**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	2.4000e-003	0.0214	6.0000e-005	7.2200e-003	4.0000e-005	7.2600e-003	1.9200e-003	4.0000e-005	1.9600e-003	0.0000	5.6261	5.6261	1.6000e-004	0.0000	5.6301
Total	**2.8700e-003**	**2.4000e-003**	**0.0214**	**6.0000e-005**	**7.2200e-003**	**4.0000e-005**	**7.2600e-003**	**1.9200e-003**	**4.0000e-005**	**1.9600e-003**	**0.0000**	**5.6261**	**5.6261**	**1.6000e-004**	**0.0000**	**5.6301**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1578	1.4445	1.5136	2.4900e-003		0.0748	0.0748		0.0704	0.0704	0.0000	214.3459	214.3459	0.0514	0.0000	215.6296
Total	**0.1578**	**1.4445**	**1.5136**	**2.4900e-003**		**0.0748**	**0.0748**		**0.0704**	**0.0704**	**0.0000**	**214.3459**	**214.3459**	**0.0514**	**0.0000**	**215.6296**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2817	9.0359	2.5722	0.0196	0.4540	0.0239	0.4778	0.1312	0.0228	0.1540	0.0000	1,897.4263	1,897.4263	0.1113	0.0000	1,900.2079
Worker	0.9214	0.7692	6.8762	0.0200	2.3180	0.0143	2.3323	0.6160	0.0132	0.6292	0.0000	1,806.1956	1,806.1956	0.0508	0.0000	1,807.4663
Total	**1.2030**	**9.8051**	**9.4484**	**0.0396**	**2.7720**	**0.0382**	**2.8102**	**0.7472**	**0.0361**	**0.7832**	**0.0000**	**3,703.6219**	**3,703.6219**	**0.1621**	**0.0000**	**3,707.6742**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1578	1.4445	1.5136	2.4900e-003		0.0748	0.0748		0.0704	0.0704	0.0000	214.3456	214.3456	0.0514	0.0000	215.6294
Total	**0.1578**	**1.4445**	**1.5136**	**2.4900e-003**		**0.0748**	**0.0748**		**0.0704**	**0.0704**	**0.0000**	**214.3456**	**214.3456**	**0.0514**	**0.0000**	**215.6294**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2817	9.0359	2.5722	0.0196	0.4540	0.0239	0.4778	0.1312	0.0228	0.1540	0.0000	1,897.4263	1,897.4263	0.1113	0.0000	1,900.2079
Worker	0.9214	0.7692	6.8762	0.0200	2.3180	0.0143	2.3323	0.6160	0.0132	0.6292	0.0000	1,806.1956	1,806.1956	0.0508	0.0000	1,807.4663
Total	**1.2030**	**9.8051**	**9.4484**	**0.0396**	**2.7720**	**0.0382**	**2.8102**	**0.7472**	**0.0361**	**0.7832**	**0.0000**	**3,703.6219**	**3,703.6219**	**0.1621**	**0.0000**	**3,707.6742**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3462	301.3462	0.0717	0.0000	303.1383
Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3462**	**301.3462**	**0.0717**	**0.0000**	**303.1383**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3023	10.4707	3.1758	0.0271	0.6381	0.0155	0.6537	0.1844	0.0149	0.1993	0.0000	2,622.8216	2,622.8216	0.1391	0.0000	2,626.2988
Worker	1.2166	0.9717	8.8248	0.0270	3.2577	0.0196	3.2773	0.8658	0.0181	0.8838	0.0000	2,443.2327	2,443.2327	0.0638	0.0000	2,444.8269
Total	**1.5189**	**11.4424**	**12.0006**	**0.0541**	**3.8958**	**0.0352**	**3.9310**	**1.0502**	**0.0329**	**1.0831**	**0.0000**	**5,066.0543**	**5,066.0543**	**0.2029**	**0.0000**	**5,071.1257**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3458	301.3458	0.0717	0.0000	303.1380
Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3458**	**301.3458**	**0.0717**	**0.0000**	**303.1380**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3023	10.4707	3.1758	0.0271	0.6381	0.0155	0.6537	0.1844	0.0149	0.1993	0.0000	2,622.8216	2,622.8216	0.1391	0.0000	2,626.2988
Worker	1.2166	0.9717	8.8248	0.0270	3.2577	0.0196	3.2773	0.8658	0.0181	0.8838	0.0000	2,443.2327	2,443.2327	0.0638	0.0000	2,444.8269
Total	**1.5189**	**11.4424**	**12.0006**	**0.0541**	**3.8958**	**0.0352**	**3.9310**	**1.0502**	**0.0329**	**1.0831**	**0.0000**	**5,066.0543**	**5,066.0543**	**0.2029**	**0.0000**	**5,071.1257**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7223**	**303.7223**	**0.0718**	**0.0000**	**305.5179**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2887	10.3133	3.0082	0.0271	0.6431	0.0144	0.6576	0.1859	0.0138	0.1997	0.0000	2,628.5066	2,628.5066	0.1409	0.0000	2,632.0283
Worker	1.1559	0.8835	8.1971	0.0262	3.2828	0.0193	3.3021	0.8724	0.0178	0.8902	0.0000	2,366.3115	2,366.3115	0.0577	0.0000	2,367.7529
Total	**1.4447**	**11.1969**	**11.2053**	**0.0533**	**3.9259**	**0.0337**	**3.9597**	**1.0583**	**0.0316**	**1.0899**	**0.0000**	**4,994.8181**	**4,994.8181**	**0.1985**	**0.0000**	**4,999.7812**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7220**	**303.7220**	**0.0718**	**0.0000**	**305.5175**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2887	10.3133	3.0082	0.0271	0.6431	0.0144	0.6576	0.1859	0.0138	0.1997	0.0000	2,628.5066	2,628.5066	0.1409	0.0000	2,632.0283
Worker	1.1559	0.8835	8.1971	0.0262	3.2828	0.0193	3.3021	0.8724	0.0178	0.8902	0.0000	2,366.3115	2,366.3115	0.0577	0.0000	2,367.7529
Total	**1.4447**	**11.1969**	**11.2053**	**0.0533**	**3.9259**	**0.0337**	**3.9597**	**1.0583**	**0.0316**	**1.0899**	**0.0000**	**4,994.8181**	**4,994.8181**	**0.1985**	**0.0000**	**4,999.7812**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2743	10.0558	2.8463	0.0268	0.6408	0.0133	0.6541	0.1852	0.0127	0.1979	0.0000	2,604.8468	2,604.8468	0.1409	0.0000	2,608.3704
Worker	1.0896	0.7969	7.5266	0.0250	3.2703	0.0188	3.2891	0.8691	0.0173	0.8864	0.0000	2,262.8078	2,262.8078	0.0517	0.0000	2,264.1002
Total	**1.3638**	**10.8527**	**10.3729**	**0.0519**	**3.9110**	**0.0321**	**3.9431**	**1.0543**	**0.0300**	**1.0843**	**0.0000**	**4,867.6546**	**4,867.6546**	**0.1926**	**0.0000**	**4,872.4706**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2743	10.0558	2.8463	0.0268	0.6408	0.0133	0.6541	0.1852	0.0127	0.1979	0.0000	2,604.8468	2,604.8468	0.1409	0.0000	2,608.3704
Worker	1.0896	0.7969	7.5266	0.0250	3.2703	0.0188	3.2891	0.8691	0.0173	0.8864	0.0000	2,262.8078	2,262.8078	0.0517	0.0000	2,264.1002
Total	**1.3638**	**10.8527**	**10.3729**	**0.0519**	**3.9110**	**0.0321**	**3.9431**	**1.0543**	**0.0300**	**1.0843**	**0.0000**	**4,867.6546**	**4,867.6546**	**0.1926**	**0.0000**	**4,872.4706**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2626	9.8610	2.7209	0.0267	0.6409	0.0123	0.6532	0.1852	0.0118	0.1970	0.0000	2,592.0781	2,592.0781	0.1415	0.0000	2,595.6151
Worker	1.0360	0.7261	6.9812	0.0241	3.2703	0.0182	3.2885	0.8691	0.0168	0.8859	0.0000	2,178.7634	2,178.7634	0.0468	0.0000	2,179.9341
Total	**1.2986**	**10.5871**	**9.7021**	**0.0508**	**3.9111**	**0.0306**	**3.9417**	**1.0543**	**0.0286**	**1.0829**	**0.0000**	**4,770.8416**	**4,770.8416**	**0.1883**	**0.0000**	**4,775.5492**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2626	9.8610	2.7209	0.0267	0.6409	0.0123	0.6532	0.1852	0.0118	0.1970	0.0000	2,592.0781	2,592.0781	0.1415	0.0000	2,595.6151
Worker	1.0360	0.7261	6.9812	0.0241	3.2703	0.0182	3.2885	0.8691	0.0168	0.8859	0.0000	2,178.7634	2,178.7634	0.0468	0.0000	2,179.9341
Total	**1.2986**	**10.5871**	**9.7021**	**0.0508**	**3.9111**	**0.0306**	**3.9417**	**1.0543**	**0.0286**	**1.0829**	**0.0000**	**4,770.8416**	**4,770.8416**	**0.1883**	**0.0000**	**4,775.5492**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2522	9.6845	2.6022	0.0265	0.6410	0.0116	0.6525	0.1853	0.0111	0.1963	0.0000	2,580.4360	2,580.4360	0.1418	0.0000	2,583.9811
Worker	0.9819	0.6605	6.4730	0.0233	3.2703	0.0172	3.2875	0.8691	0.0158	0.8849	0.0000	2,103.5268	2,103.5268	0.0423	0.0000	2,104.5840
Total	**1.2342**	**10.3451**	**9.0752**	**0.0498**	**3.9112**	**0.0288**	**3.9400**	**1.0543**	**0.0269**	**1.0812**	**0.0000**	**4,683.9629**	**4,683.9629**	**0.1841**	**0.0000**	**4,688.5651**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2522	9.6845	2.6022	0.0265	0.6410	0.0116	0.6525	0.1853	0.0111	0.1963	0.0000	2,580.4360	2,580.4360	0.1418	0.0000	2,583.9811
Worker	0.9819	0.6605	6.4730	0.0233	3.2703	0.0172	3.2875	0.8691	0.0158	0.8849	0.0000	2,103.5268	2,103.5268	0.0423	0.0000	2,104.5840
Total	**1.2342**	**10.3451**	**9.0752**	**0.0498**	**3.9112**	**0.0288**	**3.9400**	**1.0543**	**0.0269**	**1.0812**	**0.0000**	**4,683.9629**	**4,683.9629**	**0.1841**	**0.0000**	**4,688.5651**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4953**	**301.4953**	**0.0709**	**0.0000**	**303.2671**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2428	9.4946	2.5074	0.0263	0.6386	0.0109	0.6494	0.1846	0.0104	0.1949	0.0000	2,560.5790	2,560.5790	0.1415	0.0000	2,564.1165
Worker	0.9210	0.6003	6.0129	0.0224	3.2577	0.0159	3.2736	0.8658	0.0146	0.8804	0.0000	2,029.0786	2,029.0786	0.0383	0.0000	2,030.0368
Total	**1.1638**	**10.0948**	**8.5203**	**0.0487**	**3.8963**	**0.0268**	**3.9231**	**1.0503**	**0.0250**	**1.0753**	**0.0000**	**4,589.6575**	**4,589.6575**	**0.1798**	**0.0000**	**4,594.1533**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4949**	**301.4949**	**0.0709**	**0.0000**	**303.2667**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2428	9.4946	2.5074	0.0263	0.6386	0.0109	0.6494	0.1846	0.0104	0.1949	0.0000	2,560.5790	2,560.5790	0.1415	0.0000	2,564.1165
Worker	0.9210	0.6003	6.0129	0.0224	3.2577	0.0159	3.2736	0.8658	0.0146	0.8804	0.0000	2,029.0786	2,029.0786	0.0383	0.0000	2,030.0368
Total	**1.1638**	**10.0948**	**8.5203**	**0.0487**	**3.8963**	**0.0268**	**3.9231**	**1.0503**	**0.0250**	**1.0753**	**0.0000**	**4,589.6575**	**4,589.6575**	**0.1798**	**0.0000**	**4,594.1533**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2359	9.3814	2.4446	0.0263	0.6411	0.0102	0.6513	0.1853	9.7500e-003	0.1951	0.0000	2,560.6027	2,560.6027	0.1422	0.0000	2,564.1563
Worker	0.8636	0.5489	5.6168	0.0219	3.2703	0.0148	3.2851	0.8691	0.0136	0.8827	0.0000	1,977.9285	1,977.9285	0.0348	0.0000	1,978.7991
Total	**1.0995**	**9.9303**	**8.0614**	**0.0481**	**3.9114**	**0.0250**	**3.9364**	**1.0544**	**0.0234**	**1.0778**	**0.0000**	**4,538.5311**	**4,538.5311**	**0.1770**	**0.0000**	**4,542.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2359	9.3814	2.4446	0.0263	0.6411	0.0102	0.6513	0.1853	9.7500e-003	0.1951	0.0000	2,560.6027	2,560.6027	0.1422	0.0000	2,564.1563
Worker	0.8636	0.5489	5.6168	0.0219	3.2703	0.0148	3.2851	0.8691	0.0136	0.8827	0.0000	1,977.9285	1,977.9285	0.0348	0.0000	1,978.7991
Total	**1.0995**	**9.9303**	**8.0614**	**0.0481**	**3.9114**	**0.0250**	**3.9364**	**1.0544**	**0.0234**	**1.0778**	**0.0000**	**4,538.5311**	**4,538.5311**	**0.1770**	**0.0000**	**4,542.9554**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2300	9.2574	2.3895	0.0262	0.6412	9.6800e-003	0.6508	0.1853	9.2600e-003	0.1946	0.0000	2,552.8201	2,552.8201	0.1422	0.0000	2,556.3758
Worker	0.8036	0.4997	5.2416	0.0213	3.2703	0.0137	3.2840	0.8691	0.0126	0.8817	0.0000	1,926.0092	1,926.0092	0.0316	0.0000	1,926.7987
Total	**1.0335**	**9.7571**	**7.6311**	**0.0475**	**3.9114**	**0.0234**	**3.9348**	**1.0544**	**0.0219**	**1.0763**	**0.0000**	**4,478.8293**	**4,478.8293**	**0.1738**	**0.0000**	**4,483.1745**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2300	9.2574	2.3895	0.0262	0.6412	9.6800e-003	0.6508	0.1853	9.2600e-003	0.1946	0.0000	2,552.8201	2,552.8201	0.1422	0.0000	2,556.3758
Worker	0.8036	0.4997	5.2416	0.0213	3.2703	0.0137	3.2840	0.8691	0.0126	0.8817	0.0000	1,926.0092	1,926.0092	0.0316	0.0000	1,926.7987
Total	**1.0335**	**9.7571**	**7.6311**	**0.0475**	**3.9114**	**0.0234**	**3.9348**	**1.0544**	**0.0219**	**1.0763**	**0.0000**	**4,478.8293**	**4,478.8293**	**0.1738**	**0.0000**	**4,483.1745**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2251	9.1462	2.3473	0.0261	0.6412	9.2200e-003	0.6504	0.1853	8.8200e-003	0.1942	0.0000	2,546.9337	2,546.9337	0.1423	0.0000	2,550.4906
Worker	0.7392	0.4528	4.8786	0.0208	3.2703	0.0128	3.2831	0.8691	0.0118	0.8808	0.0000	1,880.5103	1,880.5103	0.0285	0.0000	1,881.2221
Total	**0.9643**	**9.5990**	**7.2260**	**0.0469**	**3.9115**	**0.0220**	**3.9335**	**1.0544**	**0.0206**	**1.0750**	**0.0000**	**4,427.4440**	**4,427.4440**	**0.1708**	**0.0000**	**4,431.7126**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2251	9.1462	2.3473	0.0261	0.6412	9.2200e-003	0.6504	0.1853	8.8200e-003	0.1942	0.0000	2,546.9337	2,546.9337	0.1423	0.0000	2,550.4906
Worker	0.7392	0.4528	4.8786	0.0208	3.2703	0.0128	3.2831	0.8691	0.0118	0.8808	0.0000	1,880.5103	1,880.5103	0.0285	0.0000	1,881.2221
Total	**0.9643**	**9.5990**	**7.2260**	**0.0469**	**3.9115**	**0.0220**	**3.9335**	**1.0544**	**0.0206**	**1.0750**	**0.0000**	**4,427.4440**	**4,427.4440**	**0.1708**	**0.0000**	**4,431.7126**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3479	344.3479	0.0138	0.0000	344.6933
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3479**	**344.3479**	**0.0138**	**0.0000**	**344.6933**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2220	9.0764	2.3264	0.0262	0.6437	8.8400e-003	0.6526	0.1861	8.4500e-003	0.1945	0.0000	2,552.5509	2,552.5509	0.1428	0.0000	2,556.1216
Worker	0.6825	0.4132	4.5743	0.0204	3.2828	0.0120	3.2948	0.8724	0.0110	0.8834	0.0000	1,847.9280	1,847.9280	0.0258	0.0000	1,848.5737
Total	**0.9045**	**9.4895**	**6.9007**	**0.0466**	**3.9265**	**0.0208**	**3.9473**	**1.0585**	**0.0195**	**1.0779**	**0.0000**	**4,400.4789**	**4,400.4789**	**0.1687**	**0.0000**	**4,404.6953**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3475	344.3475	0.0138	0.0000	344.6929
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3475**	**344.3475**	**0.0138**	**0.0000**	**344.6929**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2220	9.0764	2.3264	0.0262	0.6437	8.8400e-003	0.6526	0.1861	8.4500e-003	0.1945	0.0000	2,552.5509	2,552.5509	0.1428	0.0000	2,556.1216
Worker	0.6825	0.4132	4.5743	0.0204	3.2828	0.0120	3.2948	0.8724	0.0110	0.8834	0.0000	1,847.9280	1,847.9280	0.0258	0.0000	1,848.5737
Total	**0.9045**	**9.4895**	**6.9007**	**0.0466**	**3.9265**	**0.0208**	**3.9473**	**1.0585**	**0.0195**	**1.0779**	**0.0000**	**4,400.4789**	**4,400.4789**	**0.1687**	**0.0000**	**4,404.6953**

3.5 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

3.5 Building Construction - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2173	8.9180	2.2842	0.0259	0.6388	8.4300e-003	0.6473	0.1847	8.0600e-003	0.1927	0.0000	2,530.2668	2,530.2668	0.1419	0.0000	2,533.8134
Worker	0.6281	0.3762	4.2701	0.0199	3.2577	0.0111	3.2688	0.8658	0.0102	0.8759	0.0000	1,799.7413	1,799.7413	0.0234	0.0000	1,800.3252
Total	**0.8454**	**9.2942**	**6.5543**	**0.0458**	**3.8966**	**0.0195**	**3.9161**	**1.0504**	**0.0183**	**1.0687**	**0.0000**	**4,330.0081**	**4,330.0081**	**0.1652**	**0.0000**	**4,334.1386**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

3.5 Building Construction - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2173	8.9180	2.2842	0.0259	0.6388	8.4300e-003	0.6473	0.1847	8.0600e-003	0.1927	0.0000	2,530.2668	2,530.2668	0.1419	0.0000	2,533.8134
Worker	0.6281	0.3762	4.2701	0.0199	3.2577	0.0111	3.2688	0.8658	0.0102	0.8759	0.0000	1,799.7413	1,799.7413	0.0234	0.0000	1,800.3252
Total	**0.8454**	**9.2942**	**6.5543**	**0.0458**	**3.8966**	**0.0195**	**3.9161**	**1.0504**	**0.0183**	**1.0687**	**0.0000**	**4,330.0081**	**4,330.0081**	**0.1652**	**0.0000**	**4,334.1386**

3.5 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

3.5 Building Construction - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2145	8.8376	2.2625	0.0259	0.6389	8.1200e-003	0.6470	0.1847	7.7600e-003	0.1924	0.0000	2,528.4115	2,528.4115	0.1418	0.0000	2,531.9566
Worker	0.5892	0.3493	4.0311	0.0195	3.2577	0.0104	3.2681	0.8658	9.5400e-003	0.8753	0.0000	1,770.4207	1,770.4207	0.0214	0.0000	1,770.9545
Total	**0.8037**	**9.1868**	**6.2936**	**0.0455**	**3.8966**	**0.0185**	**3.9151**	**1.0504**	**0.0173**	**1.0677**	**0.0000**	**4,298.8322**	**4,298.8322**	**0.1632**	**0.0000**	**4,302.9111**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

3.5 Building Construction - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2145	8.8376	2.2625	0.0259	0.6389	8.1200e-003	0.6470	0.1847	7.7600e-003	0.1924	0.0000	2,528.4115	2,528.4115	0.1418	0.0000	2,531.9566
Worker	0.5892	0.3493	4.0311	0.0195	3.2577	0.0104	3.2681	0.8658	9.5400e-003	0.8753	0.0000	1,770.4207	1,770.4207	0.0214	0.0000	1,770.9545
Total	**0.8037**	**9.1868**	**6.2936**	**0.0455**	**3.8966**	**0.0185**	**3.9151**	**1.0504**	**0.0173**	**1.0677**	**0.0000**	**4,298.8322**	**4,298.8322**	**0.1632**	**0.0000**	**4,302.9111**

3.5 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

3.5 Building Construction - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

3.5 Building Construction - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

3.5 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1594	0.9381	2.1114	4.0600e-003		0.0118	0.0118		0.0118	0.0118	0.0000	344.3479	344.3479	0.0128	0.0000	344.6686
Total	**0.1594**	**0.9381**	**2.1114**	**4.0600e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**344.3479**	**344.3479**	**0.0128**	**0.0000**	**344.6686**

3.5 Building Construction - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2137	8.8356	2.2628	0.0261	0.6438	7.9200e-003	0.6517	0.1861	7.5700e-003	0.1937	0.0000	2,546.6469	2,546.6469	0.1427	0.0000	2,550.2150
Worker	0.5603	0.3308	3.8586	0.0194	3.2828	9.8100e-003	3.2926	0.8724	9.0200e-003	0.8814	0.0000	1,758.9264	1,758.9264	0.0198	0.0000	1,759.4220
Total	**0.7740**	**9.1665**	**6.1213**	**0.0455**	**3.9266**	**0.0177**	**3.9443**	**1.0585**	**0.0166**	**1.0751**	**0.0000**	**4,305.5733**	**4,305.5733**	**0.1626**	**0.0000**	**4,309.6370**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1594	0.9381	2.1114	4.0600e-003		0.0118	0.0118		0.0118	0.0118	0.0000	344.3475	344.3475	0.0128	0.0000	344.6682
Total	**0.1594**	**0.9381**	**2.1114**	**4.0600e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**344.3475**	**344.3475**	**0.0128**	**0.0000**	**344.6682**

3.5 Building Construction - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2137	8.8356	2.2628	0.0261	0.6438	7.9200e-003	0.6517	0.1861	7.5700e-003	0.1937	0.0000	2,546.6469	2,546.6469	0.1427	0.0000	2,550.2150
Worker	0.5603	0.3308	3.8586	0.0194	3.2828	9.8100e-003	3.2926	0.8724	9.0200e-003	0.8814	0.0000	1,758.9264	1,758.9264	0.0198	0.0000	1,759.4220
Total	**0.7740**	**9.1665**	**6.1213**	**0.0455**	**3.9266**	**0.0177**	**3.9443**	**1.0585**	**0.0166**	**1.0751**	**0.0000**	**4,305.5733**	**4,305.5733**	**0.1626**	**0.0000**	**4,309.6370**

3.5 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

3.5 Building Construction - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

3.5 Building Construction - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

3.5 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

3.5 Building Construction - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

3.5 Building Construction - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2129	8.8019	2.2541	0.0260	0.6414	7.8900e-003	0.6493	0.1854	7.5400e-003	0.1929	0.0000	2,536.9269	2,536.9269	0.1422	0.0000	2,540.4813
Worker	0.5582	0.3296	3.8439	0.0193	3.2703	9.7700e-003	3.2800	0.8691	8.9800e-003	0.8781	0.0000	1,752.2129	1,752.2129	0.0198	0.0000	1,752.7067
Total	**0.7711**	**9.1315**	**6.0980**	**0.0453**	**3.9116**	**0.0177**	**3.9293**	**1.0545**	**0.0165**	**1.0710**	**0.0000**	**4,289.1398**	**4,289.1398**	**0.1619**	**0.0000**	**4,293.1880**

3.5 Building Construction - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1582	0.9310	2.0953	4.0200e-003		0.0118	0.0118		0.0118	0.0118	0.0000	341.7193	341.7193	0.0127	0.0000	342.0375
Total	**0.1582**	**0.9310**	**2.0953**	**4.0200e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**341.7193**	**341.7193**	**0.0127**	**0.0000**	**342.0375**

3.5 Building Construction - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2121	8.7682	2.2455	0.0259	0.6389	7.8600e-003	0.6468	0.1847	7.5100e-003	0.1922	0.0000	2,527.2069	2,527.2069	0.1416	0.0000	2,530.7477
Worker	0.5561	0.3283	3.8291	0.0193	3.2577	9.7300e-003	3.2675	0.8658	8.9500e-003	0.8747	0.0000	1,745.4995	1,745.4995	0.0197	0.0000	1,745.9913
Total	**0.7681**	**9.0965**	**6.0746**	**0.0452**	**3.8966**	**0.0176**	**3.9142**	**1.0504**	**0.0165**	**1.0669**	**0.0000**	**4,272.7063**	**4,272.7063**	**0.1613**	**0.0000**	**4,276.7390**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1582	0.9310	2.0953	4.0200e-003		0.0118	0.0118		0.0118	0.0118	0.0000	341.7189	341.7189	0.0127	0.0000	342.0371
Total	**0.1582**	**0.9310**	**2.0953**	**4.0200e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**341.7189**	**341.7189**	**0.0127**	**0.0000**	**342.0371**

3.5 Building Construction - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2121	8.7682	2.2455	0.0259	0.6389	7.8600e-003	0.6468	0.1847	7.5100e-003	0.1922	0.0000	2,527.2069	2,527.2069	0.1416	0.0000	2,530.7477
Worker	0.5561	0.3283	3.8291	0.0193	3.2577	9.7300e-003	3.2675	0.8658	8.9500e-003	0.8747	0.0000	1,745.4995	1,745.4995	0.0197	0.0000	1,745.9913
Total	**0.7681**	**9.0965**	**6.0746**	**0.0452**	**3.8966**	**0.0176**	**3.9142**	**1.0504**	**0.0165**	**1.0669**	**0.0000**	**4,272.7063**	**4,272.7063**	**0.1613**	**0.0000**	**4,276.7390**

3.5 Building Construction - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0180	0.1034	0.2418	4.6000e-004		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	39.4292	39.4292	1.4200e-003	0.0000	39.4646
Total	**0.0180**	**0.1034**	**0.2418**	**4.6000e-004**		**1.1100e-003**	**1.1100e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**39.4292**	**39.4292**	**1.4200e-003**	**0.0000**	**39.4646**

3.5 Building Construction - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0239	0.9839	0.2563	3.0000e-003	0.0737	8.2000e-004	0.0746	0.0213	7.8000e-004	0.0221	0.0000	292.8704	292.8704	0.0164	0.0000	293.2797
Worker	0.0508	0.0303	0.3709	2.1200e-003	0.3759	8.7000e-004	0.3768	0.0999	8.0000e-004	0.1007	0.0000	192.6143	192.6143	1.6900e-003	0.0000	192.6566
Total	**0.0746**	**1.0142**	**0.6272**	**5.1200e-003**	**0.4496**	**1.6900e-003**	**0.4513**	**0.1212**	**1.5800e-003**	**0.1228**	**0.0000**	**485.4847**	**485.4847**	**0.0181**	**0.0000**	**485.9363**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0180	0.1034	0.2418	4.6000e-004		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	39.4291	39.4291	1.4200e-003	0.0000	39.4645
Total	**0.0180**	**0.1034**	**0.2418**	**4.6000e-004**		**1.1100e-003**	**1.1100e-003**		**1.1100e-003**	**1.1100e-003**	**0.0000**	**39.4291**	**39.4291**	**1.4200e-003**	**0.0000**	**39.4645**

3.5 Building Construction - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0239	0.9839	0.2563	3.0000e-003	0.0737	8.2000e-004	0.0746	0.0213	7.8000e-004	0.0221	0.0000	292.8704	292.8704	0.0164	0.0000	293.2797
Worker	0.0508	0.0303	0.3709	2.1200e-003	0.3759	8.7000e-004	0.3768	0.0999	8.0000e-004	0.1007	0.0000	192.6143	192.6143	1.6900e-003	0.0000	192.6566
Total	**0.0746**	**1.0142**	**0.6272**	**5.1200e-003**	**0.4496**	**1.6900e-003**	**0.4513**	**0.1212**	**1.5800e-003**	**0.1228**	**0.0000**	**485.4847**	**485.4847**	**0.0181**	**0.0000**	**485.9363**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1168	0.4223	1.8269	3.2400e-003		0.0135	0.0135		0.0135	0.0135	0.0000	278.3494	278.3494	9.3600e-003	0.0000	278.5833
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1168**	**0.4223**	**1.8269**	**3.2400e-003**		**0.0135**	**0.0135**		**0.0135**	**0.0135**	**0.0000**	**278.3494**	**278.3494**	**9.3600e-003**	**0.0000**	**278.5833**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2500e-003	1.3400e-003	0.0165	9.0000e-005	0.0167	4.0000e-005	0.0167	4.4300e-003	4.0000e-005	4.4700e-003	0.0000	8.5467	8.5467	8.0000e-005	0.0000	8.5485
Total	**2.2500e-003**	**1.3400e-003**	**0.0165**	**9.0000e-005**	**0.0167**	**4.0000e-005**	**0.0167**	**4.4300e-003**	**4.0000e-005**	**4.4700e-003**	**0.0000**	**8.5467**	**8.5467**	**8.0000e-005**	**0.0000**	**8.5485**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1168	0.4223	1.8269	3.2400e-003		0.0135	0.0135		0.0135	0.0135	0.0000	278.3491	278.3491	9.3600e-003	0.0000	278.5829
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1168**	**0.4223**	**1.8269**	**3.2400e-003**		**0.0135**	**0.0135**		**0.0135**	**0.0135**	**0.0000**	**278.3491**	**278.3491**	**9.3600e-003**	**0.0000**	**278.5829**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2500e-003	1.3400e-003	0.0165	9.0000e-005	0.0167	4.0000e-005	0.0167	4.4300e-003	4.0000e-005	4.4700e-003	0.0000	8.5467	8.5467	8.0000e-005	0.0000	8.5485
Total	**2.2500e-003**	**1.3400e-003**	**0.0165**	**9.0000e-005**	**0.0167**	**4.0000e-005**	**0.0167**	**4.4300e-003**	**4.0000e-005**	**4.4700e-003**	**0.0000**	**8.5467**	**8.5467**	**8.0000e-005**	**0.0000**	**8.5485**

3.6 Paving - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0501	0.1810	0.7830	1.3900e-003		5.7600e-003	5.7600e-003		5.7600e-003	5.7600e-003	0.0000	119.2926	119.2926	4.0100e-003	0.0000	119.3928
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0501**	**0.1810**	**0.7830**	**1.3900e-003**		**5.7600e-003**	**5.7600e-003**		**5.7600e-003**	**5.7600e-003**	**0.0000**	**119.2926**	**119.2926**	**4.0100e-003**	**0.0000**	**119.3928**

3.6 Paving - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	5.8000e-004	7.0500e-003	4.0000e-005	7.1500e-003	2.0000e-005	7.1600e-003	1.9000e-003	2.0000e-005	1.9100e-003	0.0000	3.6629	3.6629	3.0000e-005	0.0000	3.6637
Total	**9.7000e-004**	**5.8000e-004**	**7.0500e-003**	**4.0000e-005**	**7.1500e-003**	**2.0000e-005**	**7.1600e-003**	**1.9000e-003**	**2.0000e-005**	**1.9100e-003**	**0.0000**	**3.6629**	**3.6629**	**3.0000e-005**	**0.0000**	**3.6637**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0501	0.1810	0.7830	1.3900e-003		5.7600e-003	5.7600e-003		5.7600e-003	5.7600e-003	0.0000	119.2925	119.2925	4.0100e-003	0.0000	119.3927
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0501**	**0.1810**	**0.7830**	**1.3900e-003**		**5.7600e-003**	**5.7600e-003**		**5.7600e-003**	**5.7600e-003**	**0.0000**	**119.2925**	**119.2925**	**4.0100e-003**	**0.0000**	**119.3927**

3.6 Paving - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	5.8000e-004	7.0500e-003	4.0000e-005	7.1500e-003	2.0000e-005	7.1600e-003	1.9000e-003	2.0000e-005	1.9100e-003	0.0000	3.6629	3.6629	3.0000e-005	0.0000	3.6637
Total	**9.7000e-004**	**5.8000e-004**	**7.0500e-003**	**4.0000e-005**	**7.1500e-003**	**2.0000e-005**	**7.1600e-003**	**1.9000e-003**	**2.0000e-005**	**1.9100e-003**	**0.0000**	**3.6629**	**3.6629**	**3.0000e-005**	**0.0000**	**3.6637**

3.7 Architectural Coating - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3100e-003	0.0589	0.1452	2.4000e-004		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004	0.0000	20.6814	20.6814	7.3000e-004	0.0000	20.6996
Total	**9.3100e-003**	**0.0589**	**0.1452**	**2.4000e-004**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**	**0.0000**	**20.6814**	**20.6814**	**7.3000e-004**	**0.0000**	**20.6996**

3.7 Architectural Coating - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0549	0.0328	0.4009	2.3000e-003	0.4063	9.4000e-004	0.4072	0.1080	8.7000e-004	0.1088	0.0000	208.1833	208.1833	1.8300e-003	0.0000	208.2290
Total	**0.0549**	**0.0328**	**0.4009**	**2.3000e-003**	**0.4063**	**9.4000e-004**	**0.4072**	**0.1080**	**8.7000e-004**	**0.1088**	**0.0000**	**208.1833**	**208.1833**	**1.8300e-003**	**0.0000**	**208.2290**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3100e-003	0.0589	0.1452	2.4000e-004		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004	0.0000	20.6813	20.6813	7.3000e-004	0.0000	20.6995
Total	**9.3100e-003**	**0.0589**	**0.1452**	**2.4000e-004**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**	**0.0000**	**20.6813**	**20.6813**	**7.3000e-004**	**0.0000**	**20.6995**

3.7 Architectural Coating - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0549	0.0328	0.4009	2.3000e-003	0.4063	9.4000e-004	0.4072	0.1080	8.7000e-004	0.1088	0.0000	208.1833	208.1833	1.8300e-003	0.0000	208.2290
Total	**0.0549**	**0.0328**	**0.4009**	**2.3000e-003**	**0.4063**	**9.4000e-004**	**0.4072**	**0.1080**	**8.7000e-004**	**0.1088**	**0.0000**	**208.1833**	**208.1833**	**1.8300e-003**	**0.0000**	**208.2290**

3.7 Architectural Coating - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6500e-003	0.0611	0.1506	2.5000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	21.4473	21.4473	7.5000e-004	0.0000	21.4662
Total	**9.6500e-003**	**0.0611**	**0.1506**	**2.5000e-004**		**6.2000e-004**	**6.2000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**21.4473**	**21.4473**	**7.5000e-004**	**0.0000**	**21.4662**

3.7 Architectural Coating - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0569	0.0340	0.4158	2.3800e-003	0.4213	9.8000e-004	0.4223	0.1120	9.0000e-004	0.1129	0.0000	215.8938	215.8938	1.9000e-003	0.0000	215.9412
Total	**0.0569**	**0.0340**	**0.4158**	**2.3800e-003**	**0.4213**	**9.8000e-004**	**0.4223**	**0.1120**	**9.0000e-004**	**0.1129**	**0.0000**	**215.8938**	**215.8938**	**1.9000e-003**	**0.0000**	**215.9412**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6500e-003	0.0611	0.1506	2.5000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	21.4473	21.4473	7.5000e-004	0.0000	21.4662
Total	**9.6500e-003**	**0.0611**	**0.1506**	**2.5000e-004**		**6.2000e-004**	**6.2000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**21.4473**	**21.4473**	**7.5000e-004**	**0.0000**	**21.4662**

3.7 Architectural Coating - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0569	0.0340	0.4158	2.3800e-003	0.4213	9.8000e-004	0.4223	0.1120	9.0000e-004	0.1129	0.0000	215.8938	215.8938	1.9000e-003	0.0000	215.9412
Total	**0.0569**	**0.0340**	**0.4158**	**2.3800e-003**	**0.4213**	**9.8000e-004**	**0.4223**	**0.1120**	**9.0000e-004**	**0.1129**	**0.0000**	**215.8938**	**215.8938**	**1.9000e-003**	**0.0000**	**215.9412**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	7.9004	40.1825	90.0697	0.4497	59.0713	0.2028	59.2741	15.7847	0.1886	15.9733	0.0000	41,548.7251	41,548.7251	1.2124	0.0000	41,579.0358
Unmitigated	7.9004	40.1825	90.0697	0.4497	59.0713	0.2028	59.2741	15.7847	0.1886	15.9733	0.0000	41,548.7251	41,548.7251	1.2124	0.0000	41,579.0358

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,497.61	2,713.64	2300.53	6,354,699	6,354,699
Apartments Mid Rise	2,979.20	2,862.72	2625.28	7,401,015	7,401,015
Condo/Townhouse	34.86	34.02	29.04	86,181	86,181
General Light Industry	2,613.05	494.87	254.93	6,513,510	6,513,510
Industrial Park	822.33	299.80	87.89	1,905,069	1,905,069
Government (Civic Center)	4,866.46	0.00	0.00	8,162,312	8,162,312
Mobile Home Park	39.92	40.00	34.88	99,658	99,658
Single Family Housing	866.32	901.81	784.42	2,184,951	2,184,951
Strip Mall	24,482.37	23,222.90	11285.53	28,521,953	28,521,953
Office Park	54,380.90	7,809.52	3619.04	96,566,590	96,566,590
Total	93,583.02	38,379.27	21,021.55	157,795,938	157,795,938

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Apartments Mid Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Condo/Townhouse	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Industrial Park	13.00	5.00	5.00	59.00	28.00	13.00	79	19	2
Government (Civic Center)	13.00	5.00	5.00	75.00	20.00	5.00	50	34	16
Mobile Home Park	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Strip Mall	13.00	5.00	5.00	16.60	64.40	19.00	45	40	15
Office Park	13.00	5.00	5.00	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Apartments Mid Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Condo/Townhouse	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
General Light Industry	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Industrial Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Government (Civic Center)	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Mobile Home Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Single Family Housing	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Strip Mall	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Office Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	32,482.7412	32,482.7412	1.4688	0.3039	32,610.0183
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	32,482.7412	32,482.7412	1.4688	0.3039	32,610.0183
NaturalGas Mitigated	0.6860	6.2052	5.0094	0.0374		0.4740	0.4740		0.4740	0.4740	0.0000	6,789.1394	6,789.1394	0.1301	0.1245	6,829.4838
NaturalGas Unmitigated	0.6860	6.2052	5.0094	0.0374		0.4740	0.4740		0.4740	0.4740	0.0000	6,789.1394	6,789.1394	0.1301	0.1245	6,829.4838

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	3.86536e+006	0.0208	0.1781	0.0758	1.1400e-003		0.0144	0.0144		0.0144	0.0144	0.0000	206.2706	206.2706	3.9500e-003	3.7800e-003	207.4963
Apartments Mid Rise	3.87047e+006	0.0209	0.1784	0.0759	1.1400e-003		0.0144	0.0144		0.0144	0.0144	0.0000	206.5432	206.5432	3.9600e-003	3.7900e-003	207.7706
Condo/Townhouse	112338	6.1000e-004	5.1800e-003	2.2000e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	5.9948	5.9948	1.1000e-004	1.1000e-004	6.0304
General Light Industry	9.88986e+006	0.0533	0.4848	0.4072	2.9100e-003		0.0368	0.0368		0.0368	0.0368	0.0000	527.7607	527.7607	0.0101	9.6800e-003	530.8969
Government (Civic Center)	2.85329e+006	0.0154	0.1399	0.1175	8.4000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	152.2625	152.2625	2.9200e-003	2.7900e-003	153.1673
Industrial Park	1.97095e+006	0.0106	0.0966	0.0812	5.8000e-004		7.3400e-003	7.3400e-003		7.3400e-003	7.3400e-003	0.0000	105.1773	105.1773	2.0200e-003	1.9300e-003	105.8023
Mobile Home Park	135951	7.3000e-004	6.2600e-003	2.6700e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2549	7.2549	1.4000e-004	1.3000e-004	7.2980
Office Park	1.00571e+008	0.5423	4.9300	4.1412	0.0296		0.3747	0.3747		0.3747	0.3747	0.0000	5,366.8691	5,366.8691	0.1029	0.0984	5,398.7617
Single Family Housing	2.64492e+006	0.0143	0.1219	0.0519	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.1432	141.1432	2.7100e-003	2.5900e-003	141.9819
Strip Mall	1.30919e+006	7.0600e-003	0.0642	0.0539	3.9000e-004		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	69.8633	69.8633	1.3400e-003	1.2800e-003	70.2784
Total		**0.6860**	**6.2052**	**5.0094**	**0.0374**		**0.4740**	**0.4740**		**0.4740**	**0.4740**	**0.0000**	**6,789.1394**	**6,789.1394**	**0.1301**	**0.1245**	**6,829.4838**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	3.86536e+006	0.0208	0.1781	0.0758	1.1400e-003		0.0144	0.0144		0.0144	0.0144	0.0000	206.2706	206.2706	3.9500e-003	3.7800e-003	207.4963
Apartments Mid Rise	3.87047e+006	0.0209	0.1784	0.0759	1.1400e-003		0.0144	0.0144		0.0144	0.0144	0.0000	206.5432	206.5432	3.9600e-003	3.7900e-003	207.7706
Condo/Townhouse	112338	6.1000e-004	5.1800e-003	2.2000e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	5.9948	5.9948	1.1000e-004	1.1000e-004	6.0304
General Light Industry	9.88986e+006	0.0533	0.4848	0.4072	2.9100e-003		0.0368	0.0368		0.0368	0.0368	0.0000	527.7607	527.7607	0.0101	9.6800e-003	530.8969
Government (Civic Center)	2.85329e+006	0.0154	0.1399	0.1175	8.4000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	152.2625	152.2625	2.9200e-003	2.7900e-003	153.1673
Industrial Park	1.97095e+006	0.0106	0.0966	0.0812	5.8000e-004		7.3400e-003	7.3400e-003		7.3400e-003	7.3400e-003	0.0000	105.1773	105.1773	2.0200e-003	1.9300e-003	105.8023
Mobile Home Park	135951	7.3000e-004	6.2600e-003	2.6700e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2549	7.2549	1.4000e-004	1.3000e-004	7.2980
Office Park	1.00571e+008	0.5423	4.9300	4.1412	0.0296		0.3747	0.3747		0.3747	0.3747	0.0000	5,366.8691	5,366.8691	0.1029	0.0984	5,398.7617
Single Family Housing	2.64492e+006	0.0143	0.1219	0.0519	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.1432	141.1432	2.7100e-003	2.5900e-003	141.9819
Strip Mall	1.30919e+006	7.0600e-003	0.0642	0.0539	3.9000e-004		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	69.8633	69.8633	1.3400e-003	1.2800e-003	70.2784
Total		**0.6860**	**6.2052**	**5.0094**	**0.0374**		**0.4740**	**0.4740**		**0.4740**	**0.4740**	**0.0000**	**6,789.1394**	**6,789.1394**	**0.1301**	**0.1245**	**6,829.4838**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.6482e+006	479.4789	0.0217	4.4900e-003	481.3576
Apartments Mid Rise	1.8495e+006	538.0410	0.0243	5.0300e-003	540.1492
Condo/Townhouse	30272.6	8.8066	4.0000e-004	8.0000e-005	8.8412
General Light Industry	3.09667e+006	900.8580	0.0407	8.4300e-003	904.3878
Government (Civic Center)	3.10777e+006	904.0856	0.0409	8.4600e-003	907.6281
Industrial Park	2.14673e+006	624.5090	0.0282	5.8400e-003	626.9560
Mobile Home Park	42824.7	12.4582	5.6000e-004	1.2000e-004	12.5070
Office Park	9.30951e+007	27,082.4452	1.2246	0.2534	27,188.5622
Single Family Housing	736242	214.1812	9.6800e-003	2.0000e-003	215.0204
Strip Mall	5.90516e+006	1,717.8776	0.0777	0.0161	1,724.6088
Total		**32,482.7412**	**1.4688**	**0.3039**	**32,610.0183**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.6482e+006	479.4789	0.0217	4.4900e-003	481.3576
Apartments Mid Rise	1.8495e+006	538.0410	0.0243	5.0300e-003	540.1492
Condo/Townhouse	30272.6	8.8066	4.0000e-004	8.0000e-005	8.8412
General Light Industry	3.09667e+006	900.8580	0.0407	8.4300e-003	904.3878
Government (Civic Center)	3.10777e+006	904.0856	0.0409	8.4600e-003	907.6281
Industrial Park	2.14673e+006	624.5090	0.0282	5.8400e-003	626.9560
Mobile Home Park	42824.7	12.4582	5.6000e-004	1.2000e-004	12.5070
Office Park	9.30951e+007	27,082.4452	1.2246	0.2534	27,188.5622
Single Family Housing	736242	214.1812	9.6800e-003	2.0000e-003	215.0204
Strip Mall	5.90516e+006	1,717.8776	0.0777	0.0161	1,724.6088
Total		**32,482.7412**	**1.4688**	**0.3039**	**32,610.0183**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	31.0908	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259
Unmitigated	31.0908	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.4033					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	27.3006					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3870	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259
Total	**31.0909**	**0.1467**	**12.7315**	**6.8000e-004**		**0.0707**	**0.0707**		**0.0707**	**0.0707**	**0.0000**	**20.9201**	**20.9201**	**0.0202**	**0.0000**	**21.4259**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.4033					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	27.3006					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3870	0.1467	12.7315	6.8000e-004		0.0707	0.0707		0.0707	0.0707	0.0000	20.9201	20.9201	0.0202	0.0000	21.4259
Total	**31.0909**	**0.1467**	**12.7315**	**6.8000e-004**		**0.0707**	**0.0707**		**0.0707**	**0.0707**	**0.0000**	**20.9201**	**20.9201**	**0.0202**	**0.0000**	**21.4259**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2,689.4231	35.8567	0.8661	3,843.9265
Unmitigated	2,689.4231	35.8567	0.8661	3,843.9265

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	24.6934 / 15.5676	62.5552	0.8071	0.0195	88.5472
Apartments Mid Rise	29.189 / 18.4018	73.9439	0.9541	0.0231	104.6679
Condo/Townhouse	0.390924 / 0.246452	0.9903	0.0128	3.1000e-004	1.4018
General Light Industry	86.6956 / 0	163.9740	2.8312	0.0680	255.0109
Government (Civic Center)	34.6264 / 21.2226	87.1002	1.1317	0.0274	123.5452
Industrial Park	27.8425 / 0	52.6606	0.9092	0.0218	81.8974
Mobile Home Park	0.521232 / 0.328603	1.3204	0.0170	4.1000e-004	1.8691
Office Park	846.35 / 518.731	2,128.9332	27.6625	0.6686	3,019.7343
Single Family Housing	5.92902 / 3.73786	15.0199	0.1938	4.6800e-003	21.2607
Strip Mall	40.9177 / 25.0786	102.9254	1.3374	0.0323	145.9921
Total		**2,689.4231**	**35.8567**	**0.8660**	**3,843.9265**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	24.6934 / 15.5676	62.5552	0.8071	0.0195	88.5472
Apartments Mid Rise	29.189 / 18.4018	73.9439	0.9541	0.0231	104.6679
Condo/Townhouse	0.390924 / 0.246452	0.9903	0.0128	3.1000e-004	1.4018
General Light Industry	86.6956 / 0	163.9740	2.8312	0.0680	255.0109
Government (Civic Center)	34.6264 / 21.2226	87.1002	1.1317	0.0274	123.5452
Industrial Park	27.8425 / 0	52.6606	0.9092	0.0218	81.8974
Mobile Home Park	0.521232 / 0.328603	1.3204	0.0170	4.1000e-004	1.8691
Office Park	846.35 / 518.731	2,128.9332	27.6625	0.6686	3,019.7343
Single Family Housing	5.92902 / 3.73786	15.0199	0.1938	4.6800e-003	21.2607
Strip Mall	40.9177 / 25.0786	102.9254	1.3374	0.0323	145.9921
Total		**2,689.4231**	**35.8567**	**0.8660**	**3,843.9265**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1,443.2130	85.2914	0.0000	3,575.4990
Unmitigated	1,443.2130	85.2914	0.0000	3,575.4990

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	174.34	35.3894	2.0915	0.0000	87.6759
Apartments Mid Rise	206.08	41.8324	2.4722	0.0000	103.6379
Condo/Townhouse	2.76	0.5603	0.0331	0.0000	1.3880
General Light Industry	464.88	94.3664	5.5769	0.0000	233.7889
Government (Civic Center)	993.51	201.6736	11.9186	0.0000	499.6377
Industrial Park	149.3	30.3066	1.7911	0.0000	75.0832
Mobile Home Park	3.68	0.7470	0.0442	0.0000	1.8507
Office Park	4428.57	898.9597	53.1270	0.0000	2,227.1346
Single Family Housing	106.6	21.6388	1.2788	0.0000	53.6093
Strip Mall	580.02	117.7388	6.9582	0.0000	291.6929
Total		**1,443.2130**	**85.2915**	**0.0000**	**3,575.4991**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	174.34	35.3894	2.0915	0.0000	87.6759
Apartments Mid Rise	206.08	41.8324	2.4722	0.0000	103.6379
Condo/Townhouse	2.76	0.5603	0.0331	0.0000	1.3880
General Light Industry	464.88	94.3664	5.5769	0.0000	233.7889
Government (Civic Center)	993.51	201.6736	11.9186	0.0000	499.6377
Industrial Park	149.3	30.3066	1.7911	0.0000	75.0832
Mobile Home Park	3.68	0.7470	0.0442	0.0000	1.8507
Office Park	4428.57	898.9597	53.1270	0.0000	2,227.1346
Single Family Housing	106.6	21.6388	1.2788	0.0000	53.6093
Strip Mall	580.02	117.7388	6.9582	0.0000	291.6929
Total		**1,443.2130**	**85.2915**	**0.0000**	**3,575.4991**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Morro Bay General Plan

San Luis Obispo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,761.90	1000sqft	109.32	4,761,900.00	0
Government (Civic Center)	174.30	1000sqft	4.00	174,300.00	0
General Light Industry	374.90	1000sqft	8.61	374,900.00	0
Apartments Low Rise	379.00	Dwelling Unit	23.69	379,000.00	1084
Apartments Mid Rise	448.00	Dwelling Unit	11.79	448,000.00	1281
Condo/Townhouse	6.00	Dwelling Unit	0.38	6,000.00	17
Mobile Home Park	8.00	Dwelling Unit	1.01	9,600.00	23
Single Family Housing	91.00	Dwelling Unit	29.55	163,800.00	260
Strip Mall	552.40	1000sqft	12.68	552,400.00	0
Industrial Park	120.40	1000sqft	2.76	120,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Area Coating - SLOAPCD Rule 433 - limits VOC content to 100 g/L for flat coatings and 150 g/L for traffic Marking Coatings

Area Mitigation - Rule 504 prohibits residential wood-burning

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.7975	38.3919	22.9890	0.0403	0.1483	1.9396	2.0879	0.0393	1.8058	1.8451	0.0000	4,019.0895	4,019.0895	1.0727	0.0000	4,045.9065
2019	4.4196	45.6456	22.7864	0.0402	18.2442	2.3915	20.6358	9.9779	2.2002	12.1781	0.0000	3,959.9016	3,959.9016	1.1980	0.0000	3,986.5787
2020	4.5356	50.2689	32.6682	0.0639	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	6,190.6427	6,190.6427	1.9484	0.0000	6,239.3538
2021	4.2708	46.4637	31.5231	0.0638	8.8711	1.9866	10.8576	3.6489	1.8276	5.4766	0.0000	6,185.5239	6,185.5239	1.9482	0.0000	6,234.2279
2022	14.3929	120.1636	119.3367	0.4665	30.7488	1.6361	31.9641	8.2696	1.5052	9.4141	0.0000	47,864.5767	47,864.5767	2.5212	0.0000	47,927.6059

Morro Bay General Plan - San Luis Obispo County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	12.9603	101.2718	109.6284	0.4542	30.7497	0.9676	31.7173	8.2699	0.9094	9.1793	0.0000	46,654.1670	46,654.1670	2.3116	0.0000	46,711.9567
2024	12.2097	97.9007	102.7578	0.4444	30.7506	0.8686	31.6191	8.2703	0.8158	9.0861	0.0000	45,692.9737	45,692.9737	2.2573	0.0000	45,749.4064
2025	11.5342	94.7183	96.5748	0.4348	30.7514	0.7715	31.5228	8.2706	0.7244	8.9950	0.0000	44,746.6717	44,746.6717	2.2096	0.0000	44,801.9109
2026	11.0383	92.7694	91.3836	0.4261	30.7521	0.7600	31.5121	8.2708	0.7136	8.9844	0.0000	43,898.7583	43,898.7583	2.1719	0.0000	43,953.0567
2027	10.5491	90.9959	86.5359	0.4184	30.7527	0.7464	31.4991	8.2710	0.7008	8.9719	0.0000	43,138.5800	43,138.5800	2.1355	0.0000	43,191.9661
2028	10.0532	89.4439	82.4825	0.4115	30.7533	0.7320	31.4853	8.2712	0.6873	8.9586	0.0000	42,467.6374	42,467.6374	2.1045	0.0000	42,520.2497
2029	9.5371	87.9479	78.6659	0.4054	30.7538	0.7180	31.4718	8.2714	0.6743	8.9457	0.0000	41,865.8823	41,865.8823	2.0738	0.0000	41,917.7264
2030	8.9840	82.1418	75.3917	0.4041	30.7543	0.3266	31.0809	8.2716	0.3149	8.5865	0.0000	41,684.9335	41,684.9335	1.5617	0.0000	41,723.9749
2031	8.4665	80.9829	72.2400	0.3995	30.7546	0.3160	31.0706	8.2717	0.3050	8.5767	0.0000	41,235.9176	41,235.9176	1.5351	0.0000	41,274.2962
2032	7.9943	79.9129	69.4990	0.3955	30.7550	0.3061	31.0611	8.2719	0.2958	8.5677	0.0000	40,853.7649	40,853.7649	1.5115	0.0000	40,891.5522
2033	7.6025	79.0073	67.1975	0.3922	30.7553	0.2975	31.0528	8.2720	0.2878	8.5598	0.0000	40,530.7511	40,530.7511	1.4927	0.0000	40,568.0687
2034	7.2881	78.2145	65.1528	0.3894	30.7555	0.2897	31.0453	8.2721	0.2806	8.5526	0.0000	40,257.8829	40,257.8829	1.4748	0.0000	40,294.7529
2035	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2036	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2037	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2038	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2039	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2040	5.9918	74.2356	58.3684	0.3810	30.7563	0.1861	30.9424	8.2723	0.1790	8.4513	0.0000	39,460.1016	39,460.1016	1.4057	0.0000	39,495.2428

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2041	1.0299	3.6671	15.9688	0.0325	5.1507	0.1168	5.1697	1.3661	0.1167	1.3842	0.0000	3,230.8991	3,230.8991	0.0900	0.0000	3,231.8015
2042	0.7648	1.0914	7.0410	0.0325	5.1507	0.0191	5.1697	1.3661	0.0181	1.3842	0.0000	3,230.8991	3,230.8991	0.0361	0.0000	3,231.8015
Maximum	**14.3929**	**120.1636**	**119.3367**	**0.4665**	**30.7563**	**2.3915**	**31.9641**	**9.9779**	**2.2002**	**12.1781**	**0.0000**	**47,864.5767**	**47,864.5767**	**2.5212**	**0.0000**	**47,927.6059**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.7975	38.3919	22.9890	0.0403	0.1483	1.9396	2.0879	0.0393	1.8058	1.8451	0.0000	4,019.0895	4,019.0895	1.0727	0.0000	4,045.9065
2019	4.4196	45.6456	22.7864	0.0402	18.2442	2.3915	20.6358	9.9779	2.2002	12.1781	0.0000	3,959.9016	3,959.9016	1.1980	0.0000	3,986.5787
2020	4.5356	50.2689	32.6682	0.0639	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	6,190.6427	6,190.6427	1.9484	0.0000	6,239.3538
2021	4.2708	46.4637	31.5231	0.0638	8.8711	1.9866	10.8576	3.6489	1.8276	5.4766	0.0000	6,185.5239	6,185.5239	1.9482	0.0000	6,234.2279
2022	14.3929	120.1636	119.3367	0.4665	30.7488	1.6361	31.9641	8.2696	1.5052	9.4141	0.0000	47,864.5767	47,864.5767	2.5212	0.0000	47,927.6059
2023	12.9603	101.2718	109.6284	0.4542	30.7497	0.9676	31.7173	8.2699	0.9094	9.1793	0.0000	46,654.1670	46,654.1670	2.3116	0.0000	46,711.9567
2024	12.2097	97.9007	102.7578	0.4444	30.7506	0.8686	31.6191	8.2703	0.8158	9.0861	0.0000	45,692.9737	45,692.9737	2.2573	0.0000	45,749.4064
2025	11.5342	94.7183	96.5748	0.4348	30.7514	0.7715	31.5228	8.2706	0.7244	8.9950	0.0000	44,746.6717	44,746.6717	2.2096	0.0000	44,801.9109
2026	11.0383	92.7694	91.3836	0.4261	30.7521	0.7600	31.5121	8.2708	0.7136	8.9844	0.0000	43,898.7583	43,898.7583	2.1719	0.0000	43,953.0567

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	10.5491	90.9959	86.5359	0.4184	30.7527	0.7464	31.4991	8.2710	0.7008	8.9719	0.0000	43,138.5800	43,138.5800	2.1355	0.0000	43,191.9661
2028	10.0532	89.4439	82.4825	0.4115	30.7533	0.7320	31.4853	8.2712	0.6873	8.9586	0.0000	42,467.6374	42,467.6374	2.1045	0.0000	42,520.2497
2029	9.5371	87.9479	78.6659	0.4054	30.7538	0.7180	31.4718	8.2714	0.6743	8.9457	0.0000	41,865.8823	41,865.8823	2.0738	0.0000	41,917.7264
2030	8.9840	82.1418	75.3917	0.4041	30.7543	0.3266	31.0809	8.2716	0.3149	8.5865	0.0000	41,684.9335	41,684.9335	1.5617	0.0000	41,723.9749
2031	8.4665	80.9829	72.2400	0.3995	30.7546	0.3160	31.0706	8.2717	0.3050	8.5767	0.0000	41,235.9176	41,235.9176	1.5351	0.0000	41,274.2962
2032	7.9943	79.9129	69.4990	0.3955	30.7550	0.3061	31.0611	8.2719	0.2958	8.5677	0.0000	40,853.7649	40,853.7649	1.5115	0.0000	40,891.5522
2033	7.6025	79.0073	67.1975	0.3922	30.7553	0.2975	31.0528	8.2720	0.2878	8.5598	0.0000	40,530.7511	40,530.7511	1.4927	0.0000	40,568.0687
2034	7.2881	78.2145	65.1528	0.3894	30.7555	0.2897	31.0453	8.2721	0.2806	8.5526	0.0000	40,257.8829	40,257.8829	1.4748	0.0000	40,294.7529
2035	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2036	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2037	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2038	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2039	6.9268	76.7733	63.3937	0.3871	30.7558	0.2252	30.9809	8.2721	0.2165	8.4886	0.0000	40,029.2624	40,029.2624	1.4505	0.0000	40,065.5241
2040	5.9918	74.2356	58.3684	0.3810	30.7563	0.1861	30.9424	8.2723	0.1790	8.4513	0.0000	39,460.1016	39,460.1016	1.4057	0.0000	39,495.2428
2041	1.0299	3.6671	15.9688	0.0325	5.1507	0.1168	5.1697	1.3661	0.1167	1.3842	0.0000	3,230.8991	3,230.8991	0.0900	0.0000	3,231.8015
2042	0.7648	1.0914	7.0410	0.0325	5.1507	0.0191	5.1697	1.3661	0.0181	1.3842	0.0000	3,230.8991	3,230.8991	0.0361	0.0000	3,231.8015
Maximum	**14.3929**	**120.1636**	**119.3367**	**0.4665**	**30.7563**	**2.3915**	**31.9641**	**9.9779**	**2.2002**	**12.1781**	**0.0000**	**47,864.5767**	**47,864.5767**	**2.5212**	**0.0000**	**47,927.6059**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Energy	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
Mobile	58.6609	272.3431	631.0949	3.2363	423.0173	1.4103	424.4276	112.7977	1.3114	114.1091		329,451.6649	329,451.6649	9.1812		329,681.1936
Total	**233.0056**	**307.2332**	**735.7039**	**3.4455**	**423.0173**	**4.4360**	**427.4532**	**112.7977**	**4.3370**	**117.1347**	**0.0000**	**370,598.2477**	**370,598.2477**	**10.1023**	**0.7518**	**371,074.8383**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Energy	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
Mobile	58.6609	272.3431	631.0949	3.2363	423.0173	1.4103	424.4276	112.7977	1.3114	114.1091		329,451.6649	329,451.6649	9.1812		329,681.1936
Total	**233.0056**	**307.2332**	**735.7039**	**3.4455**	**423.0173**	**4.4360**	**427.4532**	**112.7977**	**4.3370**	**117.1347**	**0.0000**	**370,598.2477**	**370,598.2477**	**10.1023**	**0.7518**	**371,074.8383**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/3/2018	10/25/2019	5	300	
2	Site Preparation	Site Preparation	10/26/2019	7/3/2020	5	180	
3	Grading	Grading	7/4/2020	4/15/2022	5	465	
4	Building Construction	Building Construction	4/16/2022	2/10/2040	5	4650	
5	Paving	Paving	2/11/2040	5/17/2041	5	330	
6	Architectural Coating	Architectural Coating	5/18/2041	8/22/2042	5	330	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1162.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	2,603.00	1,080.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	521.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048		3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**		**1.9386**	**1.9386**		**1.8048**	**1.8048**		**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0785	0.0694	0.6849	1.4800e-003	0.1483	1.0100e-003	0.1493	0.0393	9.4000e-004	0.0403		147.3230	147.3230	5.9600e-003		147.4721
Total	**0.0785**	**0.0694**	**0.6849**	**1.4800e-003**	**0.1483**	**1.0100e-003**	**0.1493**	**0.0393**	**9.4000e-004**	**0.0403**		**147.3230**	**147.3230**	**5.9600e-003**		**147.4721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048	0.0000	3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**		**1.9386**	**1.9386**		**1.8048**	**1.8048**	**0.0000**	**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0785	0.0694	0.6849	1.4800e-003	0.1483	1.0100e-003	0.1493	0.0393	9.4000e-004	0.0403		147.3230	147.3230	5.9600e-003		147.4721
Total	**0.0785**	**0.0694**	**0.6849**	**1.4800e-003**	**0.1483**	**1.0100e-003**	**0.1493**	**0.0393**	**9.4000e-004**	**0.0403**		**147.3230**	**147.3230**	**5.9600e-003**		**147.4721**

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**		**1.7949**	**1.7949**		**1.6697**	**1.6697**		**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0705	0.0608	0.6028	1.4400e-003	0.1483	9.8000e-004	0.1493	0.0393	9.1000e-004	0.0402		143.0023	143.0023	5.2500e-003		143.1336
Total	**0.0705**	**0.0608**	**0.6028**	**1.4400e-003**	**0.1483**	**9.8000e-004**	**0.1493**	**0.0393**	**9.1000e-004**	**0.0402**		**143.0023**	**143.0023**	**5.2500e-003**		**143.1336**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**		**1.7949**	**1.7949**		**1.6697**	**1.6697**	**0.0000**	**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0705	0.0608	0.6028	1.4400e-003	0.1483	9.8000e-004	0.1493	0.0393	9.1000e-004	0.0402		143.0023	143.0023	5.2500e-003		143.1336
Total	**0.0705**	**0.0608**	**0.6028**	**1.4400e-003**	**0.1483**	**9.8000e-004**	**0.1493**	**0.0393**	**9.1000e-004**	**0.0402**		**143.0023**	**143.0023**	**5.2500e-003**		**143.1336**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**		**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0846	0.0729	0.7233	1.7200e-003	0.1780	1.1800e-003	0.1791	0.0472	1.0900e-003	0.0483		171.6027	171.6027	6.3000e-003		171.7603
Total	**0.0846**	**0.0729**	**0.7233**	**1.7200e-003**	**0.1780**	**1.1800e-003**	**0.1791**	**0.0472**	**1.0900e-003**	**0.0483**		**171.6027**	**171.6027**	**6.3000e-003**		**171.7603**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0846	0.0729	0.7233	1.7200e-003	0.1780	1.1800e-003	0.1791	0.0472	1.0900e-003	0.0483		171.6027	171.6027	6.3000e-003		171.7603
Total	**0.0846**	**0.0729**	**0.7233**	**1.7200e-003**	**0.1780**	**1.1800e-003**	**0.1791**	**0.0472**	**1.0900e-003**	**0.0483**		**171.6027**	**171.6027**	**6.3000e-003**		**171.7603**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		166.2997	166.2997	5.4200e-003		166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**166.2997**	**166.2997**	**5.4200e-003**		**166.4352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		166.2997	166.2997	5.4200e-003		166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**166.2997**	**166.2997**	**5.4200e-003**		**166.4352**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536		184.7775	184.7775	6.0200e-003		184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**		**184.7775**	**184.7775**	**6.0200e-003**		**184.9280**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536		184.7775	184.7775	6.0200e-003		184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**		**184.7775**	**184.7775**	**6.0200e-003**		**184.9280**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0797	0.0638	0.6447	1.7900e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		178.4805	178.4805	5.3600e-003		178.6144
Total	**0.0797**	**0.0638**	**0.6447**	**1.7900e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**178.4805**	**178.4805**	**5.3600e-003**		**178.6144**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0797	0.0638	0.6447	1.7900e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		178.4805	178.4805	5.3600e-003		178.6144
Total	**0.0797**	**0.0638**	**0.6447**	**1.7900e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**178.4805**	**178.4805**	**5.3600e-003**		**178.6144**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0747	0.0574	0.5916	1.7300e-003	0.1977	1.1900e-003	0.1989	0.0524	1.1000e-003	0.0535		172.0987	172.0987	4.8100e-003		172.2189
Total	**0.0747**	**0.0574**	**0.5916**	**1.7300e-003**	**0.1977**	**1.1900e-003**	**0.1989**	**0.0524**	**1.1000e-003**	**0.0535**		**172.0987**	**172.0987**	**4.8100e-003**		**172.2189**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0747	0.0574	0.5916	1.7300e-003	0.1977	1.1900e-003	0.1989	0.0524	1.1000e-003	0.0535		172.0987	172.0987	4.8100e-003		172.2189
Total	**0.0747**	**0.0574**	**0.5916**	**1.7300e-003**	**0.1977**	**1.1900e-003**	**0.1989**	**0.0524**	**1.1000e-003**	**0.0535**		**172.0987**	**172.0987**	**4.8100e-003**		**172.2189**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.9595	97.0784	25.9778	0.2148	5.0152	0.2515	5.2667	1.4446	0.2405	1.6851		22,911.5979	22,911.5979	1.2834		22,943.6820
Worker	9.7271	7.4696	76.9955	0.2248	25.7336	0.1549	25.8885	6.8251	0.1428	6.9679		22,398.6453	22,398.6453	0.6259		22,414.2917
Total	**12.6867**	**104.5480**	**102.9733**	**0.4396**	**30.7488**	**0.4064**	**31.1551**	**8.2696**	**0.3833**	**8.6530**		**45,310.2432**	**45,310.2432**	**1.9092**		**45,357.9737**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.9595	97.0784	25.9778	0.2148	5.0152	0.2515	5.2667	1.4446	0.2405	1.6851		22,911.5979	22,911.5979	1.2834		22,943.6820
Worker	9.7271	7.4696	76.9955	0.2248	25.7336	0.1549	25.8885	6.8251	0.1428	6.9679		22,398.6453	22,398.6453	0.6259		22,414.2917
Total	**12.6867**	**104.5480**	**102.9733**	**0.4396**	**30.7488**	**0.4064**	**31.1551**	**8.2696**	**0.3833**	**8.6530**		**45,310.2432**	**45,310.2432**	**1.9092**		**45,357.9737**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.2581	80.1714	22.9304	0.2110	5.0161	0.1170	5.1331	1.4449	0.1119	1.5568		22,540.6422	22,540.6422	1.1441		22,569.2446
Worker	9.1295	6.7155	70.4539	0.2163	25.7336	0.1509	25.8845	6.8251	0.1391	6.9641		21,558.3149	21,558.3149	0.5596		21,572.3060
Total	**11.3876**	**86.8870**	**93.3844**	**0.4273**	**30.7497**	**0.2679**	**31.0176**	**8.2699**	**0.2509**	**8.5209**		**44,098.9571**	**44,098.9571**	**1.7037**		**44,141.5506**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.2581	80.1714	22.9304	0.2110	5.0161	0.1170	5.1331	1.4449	0.1119	1.5568		22,540.6422	22,540.6422	1.1441		22,569.2446
Worker	9.1295	6.7155	70.4539	0.2163	25.7336	0.1509	25.8845	6.8251	0.1391	6.9641		21,558.3149	21,558.3149	0.5596		21,572.3060
Total	**11.3876**	**86.8870**	**93.3844**	**0.4273**	**30.7497**	**0.2679**	**31.0176**	**8.2699**	**0.2509**	**8.5209**		**44,098.9571**	**44,098.9571**	**1.7037**		**44,141.5506**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.1407	78.3961	21.5503	0.2096	5.0170	0.1080	5.1250	1.4452	0.1032	1.5484		22,417.3746	22,417.3746	1.1501		22,446.1262
Worker	8.5975	6.0608	65.0407	0.2079	25.7336	0.1473	25.8809	6.8251	0.1357	6.9608		20,719.9002	20,719.9002	0.5029		20,732.4725
Total	**10.7381**	**84.4570**	**86.5910**	**0.4175**	**30.7506**	**0.2552**	**31.0058**	**8.2703**	**0.2389**	**8.5092**		**43,137.2748**	**43,137.2748**	**1.6530**		**43,178.5987**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.1407	78.3961	21.5503	0.2096	5.0170	0.1080	5.1250	1.4452	0.1032	1.5484		22,417.3746	22,417.3746	1.1501		22,446.1262
Worker	8.5975	6.0608	65.0407	0.2079	25.7336	0.1473	25.8809	6.8251	0.1357	6.9608		20,719.9002	20,719.9002	0.5029		20,732.4725
Total	**10.7381**	**84.4570**	**86.5910**	**0.4175**	**30.7506**	**0.2552**	**31.0058**	**8.2703**	**0.2389**	**8.5092**		**43,137.2748**	**43,137.2748**	**1.6530**		**43,178.5987**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0416	76.7603	20.4670	0.2083	5.0178	0.0998	5.1175	1.4455	0.0954	1.5409		22,300.9644	22,300.9644	1.1554		22,329.8494
Worker	8.1252	5.4883	60.0231	0.1995	25.7336	0.1442	25.8778	6.8251	0.1328	6.9579		19,889.2330	19,889.2330	0.4532		19,900.5634
Total	**10.1668**	**82.2486**	**80.4901**	**0.4078**	**30.7514**	**0.2439**	**30.9953**	**8.2706**	**0.2282**	**8.4987**		**42,190.1973**	**42,190.1973**	**1.6086**		**42,230.4128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0416	76.7603	20.4670	0.2083	5.0178	0.0998	5.1175	1.4455	0.0954	1.5409		22,300.9644	22,300.9644	1.1554		22,329.8494
Worker	8.1252	5.4883	60.0231	0.1995	25.7336	0.1442	25.8778	6.8251	0.1328	6.9579		19,889.2330	19,889.2330	0.4532		19,900.5634
Total	**10.1668**	**82.2486**	**80.4901**	**0.4078**	**30.7514**	**0.2439**	**30.9953**	**8.2706**	**0.2282**	**8.4987**		**42,190.1973**	**42,190.1973**	**1.6086**		**42,230.4128**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9552	75.2986	19.5652	0.2071	5.0185	0.0928	5.1113	1.4458	0.0887	1.5345		22,191.7890	22,191.7890	1.1601		22,220.7902
Worker	7.7157	5.0012	55.7337	0.1920	25.7336	0.1396	25.8732	6.8251	0.1286	6.9537		19,150.4949	19,150.4949	0.4109		19,160.7684
Total	**9.6709**	**80.2998**	**75.2989**	**0.3992**	**30.7521**	**0.2324**	**30.9845**	**8.2708**	**0.2173**	**8.4881**		**41,342.2840**	**41,342.2840**	**1.5710**		**41,381.5587**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9552	75.2986	19.5652	0.2071	5.0185	0.0928	5.1113	1.4458	0.0887	1.5345		22,191.7890	22,191.7890	1.1601		22,220.7902
Worker	7.7157	5.0012	55.7337	0.1920	25.7336	0.1396	25.8732	6.8251	0.1286	6.9537		19,150.4949	19,150.4949	0.4109		19,160.7684
Total	**9.6709**	**80.2998**	**75.2989**	**0.3992**	**30.7521**	**0.2324**	**30.9845**	**8.2708**	**0.2173**	**8.4881**		**41,342.2840**	**41,342.2840**	**1.5710**		**41,381.5587**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8783	73.9766	18.7124	0.2060	5.0191	0.0871	5.1062	1.4460	0.0832	1.5292		22,092.5021	22,092.5021	1.1630		22,121.5771
Worker	7.3034	4.5497	51.7388	0.1854	25.7336	0.1318	25.8654	6.8251	0.1213	6.9464		18,489.6035	18,489.6035	0.3715		18,498.8909
Total	**9.1817**	**78.5263**	**70.4512**	**0.3914**	**30.7527**	**0.2189**	**30.9716**	**8.2710**	**0.2045**	**8.4756**		**40,582.1056**	**40,582.1056**	**1.5345**		**40,620.4681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8783	73.9766	18.7124	0.2060	5.0191	0.0871	5.1062	1.4460	0.0832	1.5292		22,092.5021	22,092.5021	1.1630		22,121.5771
Worker	7.3034	4.5497	51.7388	0.1854	25.7336	0.1318	25.8654	6.8251	0.1213	6.9464		18,489.6035	18,489.6035	0.3715		18,498.8909
Total	**9.1817**	**78.5263**	**70.4512**	**0.3914**	**30.7527**	**0.2189**	**30.9716**	**8.2710**	**0.2045**	**8.4756**		**40,582.1056**	**40,582.1056**	**1.5345**		**40,620.4681**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8150	72.8231	18.1009	0.2051	5.0197	0.0821	5.1018	1.4462	0.0784	1.5246		22,006.7974	22,006.7974	1.1653		22,035.9288
Worker	6.8708	4.1511	48.2970	0.1795	25.7336	0.1224	25.8560	6.8251	0.1126	6.9377		17,904.3657	17,904.3657	0.3383		17,912.8229
Total	**8.6858**	**76.9742**	**66.3979**	**0.3846**	**30.7533**	**0.2044**	**30.9577**	**8.2712**	**0.1911**	**8.4623**		**39,911.1631**	**39,911.1631**	**1.5036**		**39,948.7517**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8150	72.8231	18.1009	0.2051	5.0197	0.0821	5.1018	1.4462	0.0784	1.5246		22,006.7974	22,006.7974	1.1653		22,035.9288
Worker	6.8708	4.1511	48.2970	0.1795	25.7336	0.1224	25.8560	6.8251	0.1126	6.9377		17,904.3657	17,904.3657	0.3383		17,912.8229
Total	**8.6858**	**76.9742**	**66.3979**	**0.3846**	**30.7533**	**0.2044**	**30.9577**	**8.2712**	**0.1911**	**8.4623**		**39,911.1631**	**39,911.1631**	**1.5036**		**39,948.7517**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7576	71.6964	17.5813	0.2042	5.0202	0.0770	5.0972	1.4464	0.0736	1.5200		21,922.5139	21,922.5139	1.1664		21,951.6725
Worker	6.4121	3.7818	45.0000	0.1743	25.7336	0.1135	25.8471	6.8251	0.1044	6.9295		17,386.8941	17,386.8941	0.3065		17,394.5558
Total	**8.1697**	**75.4782**	**62.5813**	**0.3784**	**30.7538**	**0.1905**	**30.9443**	**8.2714**	**0.1780**	**8.4494**		**39,309.4080**	**39,309.4080**	**1.4728**		**39,346.2284**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7576	71.6964	17.5813	0.2042	5.0202	0.0770	5.0972	1.4464	0.0736	1.5200		21,922.5139	21,922.5139	1.1664		21,951.6725
Worker	6.4121	3.7818	45.0000	0.1743	25.7336	0.1135	25.8471	6.8251	0.1044	6.9295		17,386.8941	17,386.8941	0.3065		17,394.5558
Total	**8.1697**	**75.4782**	**62.5813**	**0.3784**	**30.7538**	**0.1905**	**30.9443**	**8.2714**	**0.1780**	**8.4494**		**39,309.4080**	**39,309.4080**	**1.4728**		**39,346.2284**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7132	70.7635	17.1855	0.2034	5.0207	0.0732	5.0938	1.4465	0.0699	1.5165		21,856.0591	21,856.0591	1.1673		21,885.2411
Worker	5.9617	3.4437	42.0492	0.1697	25.7336	0.1053	25.8389	6.8251	0.0969	6.9219		16,931.3277	16,931.3277	0.2781		16,938.2810
Total	**7.6748**	**74.2072**	**59.2347**	**0.3731**	**30.7543**	**0.1785**	**30.9327**	**8.2716**	**0.1668**	**8.4384**		**38,787.3868**	**38,787.3868**	**1.4454**		**38,823.5220**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7132	70.7635	17.1855	0.2034	5.0207	0.0732	5.0938	1.4465	0.0699	1.5165		21,856.0591	21,856.0591	1.1673		21,885.2411
Worker	5.9617	3.4437	42.0492	0.1697	25.7336	0.1053	25.8389	6.8251	0.0969	6.9219		16,931.3277	16,931.3277	0.2781		16,938.2810
Total	**7.6748**	**74.2072**	**59.2347**	**0.3731**	**30.7543**	**0.1785**	**30.9327**	**8.2716**	**0.1668**	**8.4384**		**38,787.3868**	**38,787.3868**	**1.4454**		**38,823.5220**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6769	69.9270	16.8830	0.2029	5.0210	0.0698	5.0908	1.4467	0.0667	1.5134		21,806.1364	21,806.1364	1.1679		21,835.3331
Worker	5.4805	3.1213	39.2000	0.1656	25.7336	0.0980	25.8316	6.8251	0.0902	6.9152		16,532.2345	16,532.2345	0.2510		16,538.5103
Total	**7.1573**	**73.0483**	**56.0830**	**0.3685**	**30.7546**	**0.1678**	**30.9224**	**8.2717**	**0.1569**	**8.4286**		**38,338.3709**	**38,338.3709**	**1.4189**		**38,373.8434**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6769	69.9270	16.8830	0.2029	5.0210	0.0698	5.0908	1.4467	0.0667	1.5134		21,806.1364	21,806.1364	1.1679		21,835.3331
Worker	5.4805	3.1213	39.2000	0.1656	25.7336	0.0980	25.8316	6.8251	0.0902	6.9152		16,532.2345	16,532.2345	0.2510		16,538.5103
Total	**7.1573**	**73.0483**	**56.0830**	**0.3685**	**30.7546**	**0.1678**	**30.9224**	**8.2717**	**0.1569**	**8.4286**		**38,338.3709**	**38,338.3709**	**1.4189**		**38,373.8434**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6476	69.1397	16.6691	0.2025	5.0214	0.0667	5.0880	1.4468	0.0637	1.5105		21,771.5949	21,771.5949	1.1681		21,800.7985
Worker	5.0376	2.8386	36.6729	0.1621	25.7336	0.0913	25.8249	6.8251	0.0840	6.9090		16,184.6232	16,184.6232	0.2271		16,190.3008
Total	**6.6852**	**71.9783**	**53.3420**	**0.3646**	**30.7550**	**0.1580**	**30.9129**	**8.2719**	**0.1477**	**8.4196**		**37,956.2181**	**37,956.2181**	**1.3952**		**37,991.0993**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6476	69.1397	16.6691	0.2025	5.0214	0.0667	5.0880	1.4468	0.0637	1.5105		21,771.5949	21,771.5949	1.1681		21,800.7985
Worker	5.0376	2.8386	36.6729	0.1621	25.7336	0.0913	25.8249	6.8251	0.0840	6.9090		16,184.6232	16,184.6232	0.2271		16,190.3008
Total	**6.6852**	**71.9783**	**53.3420**	**0.3646**	**30.7550**	**0.1580**	**30.9129**	**8.2719**	**0.1477**	**8.4196**		**37,956.2181**	**37,956.2181**	**1.3952**		**37,991.0993**

3.5 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6250	68.4677	16.4918	0.2022	5.0217	0.0641	5.0858	1.4469	0.0613	1.5082		21,748.6389	21,748.6389	1.1693		21,777.8718
Worker	4.6684	2.6050	34.5488	0.1591	25.7336	0.0853	25.8189	6.8251	0.0784	6.9035		15,884.5654	15,884.5654	0.2072		15,889.7440
Total	**6.2934**	**71.0727**	**51.0406**	**0.3613**	**30.7553**	**0.1494**	**30.9047**	**8.2720**	**0.1397**	**8.4117**		**37,633.2043**	**37,633.2043**	**1.3765**		**37,667.6159**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6250	68.4677	16.4918	0.2022	5.0217	0.0641	5.0858	1.4469	0.0613	1.5082		21,748.6389	21,748.6389	1.1693		21,777.8718
Worker	4.6684	2.6050	34.5488	0.1591	25.7336	0.0853	25.8189	6.8251	0.0784	6.9035		15,884.5654	15,884.5654	0.2072		15,889.7440
Total	**6.2934**	**71.0727**	**51.0406**	**0.3613**	**30.7553**	**0.1494**	**30.9047**	**8.2720**	**0.1397**	**8.4117**		**37,633.2043**	**37,633.2043**	**1.3765**		**37,667.6159**

3.5 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6042	67.8606	16.3343	0.2020	5.0219	0.0618	5.0837	1.4470	0.0591	1.5061		21,733.9525	21,733.9525	1.1690		21,763.1775
Worker	4.3748	2.4193	32.6615	0.1565	25.7336	0.0798	25.8134	6.8251	0.0734	6.8984		15,626.3837	15,626.3837	0.1896		15,631.1225
Total	**5.9790**	**70.2799**	**48.9958**	**0.3585**	**30.7555**	**0.1416**	**30.8971**	**8.2721**	**0.1324**	**8.4045**		**37,360.3362**	**37,360.3362**	**1.3586**		**37,394.3000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6042	67.8606	16.3343	0.2020	5.0219	0.0618	5.0837	1.4470	0.0591	1.5061		21,733.9525	21,733.9525	1.1690		21,763.1775
Worker	4.3748	2.4193	32.6615	0.1565	25.7336	0.0798	25.8134	6.8251	0.0734	6.8984		15,626.3837	15,626.3837	0.1896		15,631.1225
Total	**5.9790**	**70.2799**	**48.9958**	**0.3585**	**30.7555**	**0.1416**	**30.8971**	**8.2721**	**0.1324**	**8.4045**		**37,360.3362**	**37,360.3362**	**1.3586**		**37,394.3000**

3.5 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

3.5 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

3.5 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

3.5 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

3.5 Building Construction - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5859	67.3374	16.2102	0.2019	5.0222	0.0599	5.0821	1.4471	0.0572	1.5043		21,724.8035	21,724.8035	1.1677		21,753.9965
Worker	4.1240	2.2745	31.0657	0.1543	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		15,406.9122	15,406.9122	0.1748		15,411.2829
Total	**5.7100**	**69.6119**	**47.2759**	**0.3561**	**30.7558**	**0.1348**	**30.8905**	**8.2721**	**0.1261**	**8.3982**		**37,131.7157**	**37,131.7157**	**1.3426**		**37,165.2794**

3.5 Building Construction - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1970	6.8903	16.1185	0.0310		0.0737	0.0737		0.0737	0.0737		2,897.5471	2,897.5471	0.1041		2,900.1503
Total	**1.1970**	**6.8903**	**16.1185**	**0.0310**		**0.0737**	**0.0737**		**0.0737**	**0.0737**		**2,897.5471**	**2,897.5471**	**0.1041**		**2,900.1503**

3.5 Building Construction - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5476	65.5247	16.0267	0.2025	5.0227	0.0543	5.0770	1.4473	0.0519	1.4991		21,826.6217	21,826.6217	1.1707		21,855.8881
Worker	3.2472	1.8205	26.2233	0.1475	25.7336	0.0581	25.7917	6.8251	0.0534	6.8785		14,735.9328	14,735.9328	0.1309		14,739.2044
Total	**4.7948**	**67.3453**	**42.2500**	**0.3500**	**30.7563**	**0.1124**	**30.8687**	**8.2723**	**0.1053**	**8.3776**		**36,562.5545**	**36,562.5545**	**1.3015**		**36,595.0925**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1970	6.8903	16.1185	0.0310		0.0737	0.0737		0.0737	0.0737	0.0000	2,897.5471	2,897.5471	0.1041		2,900.1503
Total	**1.1970**	**6.8903**	**16.1185**	**0.0310**		**0.0737**	**0.0737**		**0.0737**	**0.0737**	**0.0000**	**2,897.5471**	**2,897.5471**	**0.1041**		**2,900.1503**

3.5 Building Construction - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.5476	65.5247	16.0267	0.2025	5.0227	0.0543	5.0770	1.4473	0.0519	1.4991		21,826.6217	21,826.6217	1.1707		21,855.8881
Worker	3.2472	1.8205	26.2233	0.1475	25.7336	0.0581	25.7917	6.8251	0.0534	6.8785		14,735.9328	14,735.9328	0.1309		14,739.2044
Total	**4.7948**	**67.3453**	**42.2500**	**0.3500**	**30.7563**	**0.1124**	**30.8687**	**8.2723**	**0.1053**	**8.3776**		**36,562.5545**	**36,562.5545**	**1.3015**		**36,595.0925**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0187	0.0105	0.1511	8.5000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		84.9170	84.9170	7.5000e-004		84.9359
Total	**0.0187**	**0.0105**	**0.1511**	**8.5000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**84.9170**	**84.9170**	**7.5000e-004**		**84.9359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0187	0.0105	0.1511	8.5000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		84.9170	84.9170	7.5000e-004		84.9359
Total	**0.0187**	**0.0105**	**0.1511**	**8.5000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**84.9170**	**84.9170**	**7.5000e-004**		**84.9359**

3.6 Paving - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0187	0.0105	0.1511	8.5000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		84.9170	84.9170	7.5000e-004		84.9359
Total	**0.0187**	**0.0105**	**0.1511**	**8.5000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**84.9170**	**84.9170**	**7.5000e-004**		**84.9359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0187	0.0105	0.1511	8.5000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		84.9170	84.9170	7.5000e-004		84.9359
Total	**0.0187**	**0.0105**	**0.1511**	**8.5000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**84.9170**	**84.9170**	**7.5000e-004**		**84.9359**

3.7 Architectural Coating - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6499	0.3644	5.2487	0.0295	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,949.4510	2,949.4510	0.0262		2,950.1058
Total	**0.6499**	**0.3644**	**5.2487**	**0.0295**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,949.4510**	**2,949.4510**	**0.0262**		**2,950.1058**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6499	0.3644	5.2487	0.0295	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,949.4510	2,949.4510	0.0262		2,950.1058
Total	**0.6499**	**0.3644**	**5.2487**	**0.0295**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,949.4510**	**2,949.4510**	**0.0262**		**2,950.1058**

3.7 Architectural Coating - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6499	0.3644	5.2487	0.0295	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,949.4510	2,949.4510	0.0262		2,950.1058
Total	**0.6499**	**0.3644**	**5.2487**	**0.0295**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,949.4510**	**2,949.4510**	**0.0262**		**2,950.1058**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6499	0.3644	5.2487	0.0295	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,949.4510	2,949.4510	0.0262		2,950.1058
Total	**0.6499**	**0.3644**	**5.2487**	**0.0295**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,949.4510**	**2,949.4510**	**0.0262**		**2,950.1058**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	58.6609	272.3431	631.0949	3.2363	423.0173	1.4103	424.4276	112.7977	1.3114	114.1091		329,451.6649	329,451.6649	9.1812		329,681.1936
Unmitigated	58.6609	272.3431	631.0949	3.2363	423.0173	1.4103	424.4276	112.7977	1.3114	114.1091		329,451.6649	329,451.6649	9.1812		329,681.1936

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,497.61	2,713.64	2300.53	6,354,699	6,354,699
Apartments Mid Rise	2,979.20	2,862.72	2625.28	7,401,015	7,401,015
Condo/Townhouse	34.86	34.02	29.04	86,181	86,181
General Light Industry	2,613.05	494.87	254.93	6,513,510	6,513,510
Industrial Park	822.33	299.80	87.89	1,905,069	1,905,069
Government (Civic Center)	4,866.46	0.00	0.00	8,162,312	8,162,312
Mobile Home Park	39.92	40.00	34.88	99,658	99,658
Single Family Housing	866.32	901.81	784.42	2,184,951	2,184,951
Strip Mall	24,482.37	23,222.90	11285.53	28,521,953	28,521,953
Office Park	54,380.90	7,809.52	3619.04	96,566,590	96,566,590
Total	93,583.02	38,379.27	21,021.55	157,795,938	157,795,938

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Apartments Mid Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Condo/Townhouse	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Industrial Park	13.00	5.00	5.00	59.00	28.00	13.00	79	19	2
Government (Civic Center)	13.00	5.00	5.00	75.00	20.00	5.00	50	34	16
Mobile Home Park	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Strip Mall	13.00	5.00	5.00	16.60	64.40	19.00	45	40	15
Office Park	13.00	5.00	5.00	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Apartments Mid Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Condo/Townhouse	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
General Light Industry	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Industrial Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Government (Civic Center)	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Mobile Home Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Single Family Housing	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Strip Mall	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Office Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
NaturalGas Unmitigated	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	10590	0.1142	0.9759	0.4153	6.2300e-003		0.0789	0.0789		0.0789	0.0789		1,245.8869	1,245.8869	0.0239	0.0228	1,253.2906
Apartments Mid Rise	10604	0.1144	0.9772	0.4158	6.2400e-003		0.0790	0.0790		0.0790	0.0790		1,247.5338	1,247.5338	0.0239	0.0229	1,254.9473
Condo/Townhouse	307.776	3.3200e-003	0.0284	0.0121	1.8000e-004		2.2900e-003	2.2900e-003		2.2900e-003	2.2900e-003		36.2089	36.2089	6.9000e-004	6.6000e-004	36.4241
General Light Industry	27095.5	0.2922	2.6564	2.2314	0.0159		0.2019	0.2019		0.2019	0.2019		3,187.7073	3,187.7073	0.0611	0.0584	3,206.6503
Government (Civic Center)	7817.24	0.0843	0.7664	0.6438	4.6000e-003		0.0583	0.0583		0.0583	0.0583		919.6748	919.6748	0.0176	0.0169	925.1400
Industrial Park	5399.86	0.0582	0.5294	0.4447	3.1800e-003		0.0402	0.0402		0.0402	0.0402		635.2774	635.2774	0.0122	0.0117	639.0525
Mobile Home Park	372.468	4.0200e-003	0.0343	0.0146	2.2000e-004		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003		43.8197	43.8197	8.4000e-004	8.0000e-004	44.0801
Office Park	275538	2.9715	27.0135	22.6914	0.1621		2.0530	2.0530		2.0530	2.0530		32,416.2218	32,416.2218	0.6213	0.5943	32,608.8552
Single Family Housing	7246.36	0.0782	0.6678	0.2842	4.2600e-003		0.0540	0.0540		0.0540	0.0540		852.5135	852.5135	0.0163	0.0156	857.5796
Strip Mall	3586.82	0.0387	0.3517	0.2954	2.1100e-003		0.0267	0.0267		0.0267	0.0267		421.9784	421.9784	8.0900e-003	7.7400e-003	424.4860
Total		**3.7590**	**34.0011**	**27.4486**	**0.2050**		**2.5971**	**2.5971**		**2.5971**	**2.5971**		**41,006.8225**	**41,006.8225**	**0.7860**	**0.7518**	**41,250.5055**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	10.59	0.1142	0.9759	0.4153	6.2300e-003		0.0789	0.0789		0.0789	0.0789		1,245.8869	1,245.8869	0.0239	0.0228	1,253.2906
Apartments Mid Rise	10.604	0.1144	0.9772	0.4158	6.2400e-003		0.0790	0.0790		0.0790	0.0790		1,247.5338	1,247.5338	0.0239	0.0229	1,254.9473
Condo/Townhouse	0.307776	3.3200e-003	0.0284	0.0121	1.8000e-004		2.2900e-003	2.2900e-003		2.2900e-003	2.2900e-003		36.2089	36.2089	6.9000e-004	6.6000e-004	36.4241
General Light Industry	27.0955	0.2922	2.6564	2.2314	0.0159		0.2019	0.2019		0.2019	0.2019		3,187.7073	3,187.7073	0.0611	0.0584	3,206.6503
Government (Civic Center)	7.81724	0.0843	0.7664	0.6438	4.6000e-003		0.0583	0.0583		0.0583	0.0583		919.6748	919.6748	0.0176	0.0169	925.1400
Industrial Park	5.39986	0.0582	0.5294	0.4447	3.1800e-003		0.0402	0.0402		0.0402	0.0402		635.2774	635.2774	0.0122	0.0117	639.0525
Mobile Home Park	0.372468	4.0200e-003	0.0343	0.0146	2.2000e-004		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003		43.8197	43.8197	8.4000e-004	8.0000e-004	44.0801
Office Park	275.538	2.9715	27.0135	22.6914	0.1621		2.0530	2.0530		2.0530	2.0530		32,416.2218	32,416.2218	0.6213	0.5943	32,608.8552
Single Family Housing	7.24636	0.0782	0.6678	0.2842	4.2600e-003		0.0540	0.0540		0.0540	0.0540		852.5135	852.5135	0.0163	0.0156	857.5796
Strip Mall	3.58682	0.0387	0.3517	0.2954	2.1100e-003		0.0267	0.0267		0.0267	0.0267		421.9784	421.9784	8.0900e-003	7.7400e-003	424.4860
Total		**3.7590**	**34.0011**	**27.4486**	**0.2050**		**2.5971**	**2.5971**		**2.5971**	**2.5971**		**41,006.8225**	**41,006.8225**	**0.7860**	**0.7518**	**41,250.5055**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Unmitigated	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.6480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	149.5924					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3452	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286		139.7603	139.7603	0.1352		143.1392
Total	**170.5857**	**0.8891**	**77.1605**	**4.1100e-003**		**0.4286**	**0.4286**		**0.4286**	**0.4286**	**0.0000**	**139.7603**	**139.7603**	**0.1352**	**0.0000**	**143.1392**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.6480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	149.5924					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3452	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286		139.7603	139.7603	0.1352		143.1392
Total	**170.5857**	**0.8891**	**77.1605**	**4.1100e-003**		**0.4286**	**0.4286**		**0.4286**	**0.4286**	**0.0000**	**139.7603**	**139.7603**	**0.1352**	**0.0000**	**143.1392**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Morro Bay General Plan

San Luis Obispo County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,761.90	1000sqft	109.32	4,761,900.00	0
Government (Civic Center)	174.30	1000sqft	4.00	174,300.00	0
General Light Industry	374.90	1000sqft	8.61	374,900.00	0
Apartments Low Rise	379.00	Dwelling Unit	23.69	379,000.00	1084
Apartments Mid Rise	448.00	Dwelling Unit	11.79	448,000.00	1281
Condo/Townhouse	6.00	Dwelling Unit	0.38	6,000.00	17
Mobile Home Park	8.00	Dwelling Unit	1.01	9,600.00	23
Single Family Housing	91.00	Dwelling Unit	29.55	163,800.00	260
Strip Mall	552.40	1000sqft	12.68	552,400.00	0
Industrial Park	120.40	1000sqft	2.76	120,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2040
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Area Coating - SLOAPCD Rule 433 - limits VOC content to 100 g/L for flat coatings and 150 g/L for traffic Marking Coatings

Area Mitigation - Rule 504 prohibits residential wood-burning

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.8081	38.4013	22.9782	0.0402	0.1483	1.9396	2.0879	0.0393	1.8058	1.8451	0.0000	4,012.2102	4,012.2102	1.0726	0.0000	4,039.0238
2019	4.4312	45.6555	22.7705	0.0402	18.2442	2.3915	20.6358	9.9779	2.2002	12.1781	0.0000	3,953.2126	3,953.2126	1.1978	0.0000	3,979.8862
2020	4.5476	50.2785	32.6490	0.0638	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	6,181.9907	6,181.9907	1.9482	0.0000	6,230.6968
2021	4.2822	46.4722	31.5040	0.0637	8.8711	1.9866	10.8576	3.6489	1.8276	5.4766	0.0000	6,177.1662	6,177.1662	1.9480	0.0000	6,225.8655
2022	15.9961	120.4616	120.3741	0.4494	30.7488	1.6361	31.9799	8.2696	1.5052	9.4292	0.0000	46,102.1437	46,102.1437	2.5897	0.0000	46,166.8858

Morro Bay General Plan - San Luis Obispo County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	14.4649	101.5563	109.9627	0.4375	30.7497	0.9736	31.7233	8.2699	0.9151	9.1851	0.0000	44,929.6895	44,929.6895	2.3647	0.0000	44,988.8074
2024	13.6598	98.0853	103.0069	0.4281	30.7506	0.8740	31.6246	8.2703	0.8210	9.0913	0.0000	44,011.2391	44,011.2391	2.3121	0.0000	44,069.0414
2025	12.9350	94.8172	96.7923	0.4189	30.7514	0.7762	31.5275	8.2706	0.7289	8.9995	0.0000	43,107.2089	43,107.2089	2.2658	0.0000	43,163.8529
2026	12.3987	92.7961	91.5878	0.4106	30.7521	0.7641	31.5162	8.2708	0.7175	8.9884	0.0000	42,296.9964	42,296.9964	2.2296	0.0000	42,352.7354
2027	11.8654	90.9538	86.7246	0.4032	30.7527	0.7501	31.5028	8.2710	0.7043	8.9754	0.0000	41,569.4988	41,569.4988	2.1944	0.0000	41,624.3581
2028	11.3128	89.3455	82.6787	0.3967	30.7533	0.7353	31.4886	8.2712	0.6904	8.9617	0.0000	40,928.0653	40,928.0653	2.1645	0.0000	40,982.1775
2029	10.7331	87.7989	78.8673	0.3908	30.7538	0.7208	31.4746	8.2714	0.6769	8.9483	0.0000	40,352.7670	40,352.7670	2.1345	0.0000	40,406.1300
2030	10.1156	81.9451	75.6080	0.3897	30.7543	0.3291	31.0833	8.2716	0.3173	8.5889	0.0000	40,193.9207	40,193.9207	1.6232	0.0000	40,234.4999
2031	9.5245	80.7399	72.4731	0.3853	30.7546	0.3181	31.0728	8.2717	0.3071	8.5788	0.0000	39,763.0945	39,763.0945	1.5973	0.0000	39,803.0283
2032	8.9831	79.6302	69.7540	0.3815	30.7550	0.3080	31.0630	8.2719	0.2977	8.5695	0.0000	39,395.5848	39,395.5848	1.5742	0.0000	39,434.9407
2033	8.5338	78.6891	67.4756	0.3783	30.7553	0.2993	31.0545	8.2720	0.2895	8.5615	0.0000	39,084.0062	39,084.0062	1.5561	0.0000	39,122.9082
2034	8.1759	77.8671	65.4543	0.3756	30.7555	0.2913	31.0468	8.2721	0.2821	8.5541	0.0000	38,820.1180	38,820.1180	1.5385	0.0000	38,858.5816
2035	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2036	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2037	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2038	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2039	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2040	6.7102	73.7791	58.7722	0.3674	30.7563	0.1870	30.9433	8.2723	0.1799	8.4522	0.0000	38,039.3749	38,039.3749	1.4693	0.0000	38,076.1064

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2041	1.0335	3.6684	15.9593	0.0311	5.1507	0.1168	5.1697	1.3661	0.1167	1.3842	0.0000	3,091.4063	3,091.4063	0.0900	0.0000	3,092.2674
2042	0.8888	1.1383	6.7110	0.0311	5.1507	0.0191	5.1697	1.3661	0.0181	1.3842	0.0000	3,091.4063	3,091.4063	0.0344	0.0000	3,092.2674
Maximum	**15.9961**	**120.4616**	**120.3741**	**0.4494**	**30.7563**	**2.3915**	**31.9799**	**9.9779**	**2.2002**	**12.1781**	**0.0000**	**46,102.1437**	**46,102.1437**	**2.5897**	**0.0000**	**46,166.8858**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.8081	38.4013	22.9782	0.0402	0.1483	1.9396	2.0879	0.0393	1.8058	1.8451	0.0000	4,012.2102	4,012.2102	1.0726	0.0000	4,039.0238
2019	4.4312	45.6555	22.7705	0.0402	18.2442	2.3915	20.6358	9.9779	2.2002	12.1781	0.0000	3,953.2126	3,953.2126	1.1978	0.0000	3,979.8862
2020	4.5476	50.2785	32.6490	0.0638	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	6,181.9907	6,181.9907	1.9482	0.0000	6,230.6968
2021	4.2822	46.4722	31.5040	0.0637	8.8711	1.9866	10.8576	3.6489	1.8276	5.4766	0.0000	6,177.1662	6,177.1662	1.9480	0.0000	6,225.8655
2022	15.9961	120.4616	120.3741	0.4494	30.7488	1.6361	31.9799	8.2696	1.5052	9.4292	0.0000	46,102.1437	46,102.1437	2.5897	0.0000	46,166.8858
2023	14.4649	101.5563	109.9627	0.4375	30.7497	0.9736	31.7233	8.2699	0.9151	9.1851	0.0000	44,929.6895	44,929.6895	2.3647	0.0000	44,988.8074
2024	13.6598	98.0853	103.0069	0.4281	30.7506	0.8740	31.6246	8.2703	0.8210	9.0913	0.0000	44,011.2391	44,011.2391	2.3121	0.0000	44,069.0414
2025	12.9350	94.8172	96.7923	0.4189	30.7514	0.7762	31.5275	8.2706	0.7289	8.9995	0.0000	43,107.2089	43,107.2089	2.2658	0.0000	43,163.8529
2026	12.3987	92.7961	91.5878	0.4106	30.7521	0.7641	31.5162	8.2708	0.7175	8.9884	0.0000	42,296.9964	42,296.9964	2.2296	0.0000	42,352.7354

Morro Bay General Plan - San Luis Obispo County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	11.8654	90.9538	86.7246	0.4032	30.7527	0.7501	31.5028	8.2710	0.7043	8.9754	0.0000	41,569.4988	41,569.4988	2.1944	0.0000	41,624.3581
2028	11.3128	89.3455	82.6787	0.3967	30.7533	0.7353	31.4886	8.2712	0.6904	8.9617	0.0000	40,928.0653	40,928.0653	2.1645	0.0000	40,982.1775
2029	10.7331	87.7989	78.8673	0.3908	30.7538	0.7208	31.4746	8.2714	0.6769	8.9483	0.0000	40,352.7670	40,352.7670	2.1345	0.0000	40,406.1300
2030	10.1156	81.9451	75.6080	0.3897	30.7543	0.3291	31.0833	8.2716	0.3173	8.5889	0.0000	40,193.9207	40,193.9207	1.6232	0.0000	40,234.4999
2031	9.5245	80.7399	72.4731	0.3853	30.7546	0.3181	31.0728	8.2717	0.3071	8.5788	0.0000	39,763.0945	39,763.0945	1.5973	0.0000	39,803.0283
2032	8.9831	79.6302	69.7540	0.3815	30.7550	0.3080	31.0630	8.2719	0.2977	8.5695	0.0000	39,395.5848	39,395.5848	1.5742	0.0000	39,434.9407
2033	8.5338	78.6891	67.4756	0.3783	30.7553	0.2993	31.0545	8.2720	0.2895	8.5615	0.0000	39,084.0062	39,084.0062	1.5561	0.0000	39,122.9082
2034	8.1759	77.8671	65.4543	0.3756	30.7555	0.2913	31.0468	8.2721	0.2821	8.5541	0.0000	38,820.1180	38,820.1180	1.5385	0.0000	38,858.5816
2035	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2036	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2037	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2038	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2039	7.7780	76.4027	63.7170	0.3733	30.7558	0.2266	30.9823	8.2721	0.2178	8.4900	0.0000	38,598.7419	38,598.7419	1.5144	0.0000	38,636.6024
2040	6.7102	73.7791	58.7722	0.3674	30.7563	0.1870	30.9433	8.2723	0.1799	8.4522	0.0000	38,039.3749	38,039.3749	1.4693	0.0000	38,076.1064
2041	1.0335	3.6684	15.9593	0.0311	5.1507	0.1168	5.1697	1.3661	0.1167	1.3842	0.0000	3,091.4063	3,091.4063	0.0900	0.0000	3,092.2674
2042	0.8888	1.1383	6.7110	0.0311	5.1507	0.0191	5.1697	1.3661	0.0181	1.3842	0.0000	3,091.4063	3,091.4063	0.0344	0.0000	3,092.2674
Maximum	**15.9961**	**120.4616**	**120.3741**	**0.4494**	**30.7563**	**2.3915**	**31.9799**	**9.9779**	**2.2002**	**12.1781**	**0.0000**	**46,102.1437**	**46,102.1437**	**2.5897**	**0.0000**	**46,166.8858**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Energy	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
Mobile	55.1813	275.2493	635.1896	3.1046	423.0173	1.4135	424.4308	112.7977	1.3145	114.1122		316,051.4036	316,051.4036	9.4507		316,287.6701
Total	**229.5259**	**310.1394**	**739.7987**	**3.3138**	**423.0173**	**4.4392**	**427.4565**	**112.7977**	**4.3401**	**117.1378**	**0.0000**	**357,197.9864**	**357,197.9864**	**10.3718**	**0.7518**	**357,681.3148**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Energy	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
Mobile	55.1813	275.2493	635.1896	3.1046	423.0173	1.4135	424.4308	112.7977	1.3145	114.1122		316,051.4036	316,051.4036	9.4507		316,287.6701
Total	**229.5259**	**310.1394**	**739.7987**	**3.3138**	**423.0173**	**4.4392**	**427.4565**	**112.7977**	**4.3401**	**117.1378**	**0.0000**	**357,197.9864**	**357,197.9864**	**10.3718**	**0.7518**	**357,681.3148**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/3/2018	10/25/2019	5	300	
2	Site Preparation	Site Preparation	10/26/2019	7/3/2020	5	180	
3	Grading	Grading	7/4/2020	4/15/2022	5	465	
4	Building Construction	Building Construction	4/16/2022	2/10/2040	5	4650	
5	Paving	Paving	2/11/2040	5/17/2041	5	330	
6	Architectural Coating	Architectural Coating	5/18/2041	8/22/2042	5	330	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1162.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	2,603.00	1,080.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	521.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048		3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**		**1.9386**	**1.9386**		**1.8048**	**1.8048**		**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0892	0.0788	0.6742	1.4100e-003	0.1483	1.0100e-003	0.1493	0.0393	9.4000e-004	0.0403		140.4437	140.4437	5.8300e-003		140.5895
Total	**0.0892**	**0.0788**	**0.6742**	**1.4100e-003**	**0.1483**	**1.0100e-003**	**0.1493**	**0.0393**	**9.4000e-004**	**0.0403**		**140.4437**	**140.4437**	**5.8300e-003**		**140.5895**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048	0.0000	3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**		**1.9386**	**1.9386**		**1.8048**	**1.8048**	**0.0000**	**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0892	0.0788	0.6742	1.4100e-003	0.1483	1.0100e-003	0.1493	0.0393	9.4000e-004	0.0403		140.4437	140.4437	5.8300e-003		140.5895
Total	**0.0892**	**0.0788**	**0.6742**	**1.4100e-003**	**0.1483**	**1.0100e-003**	**0.1493**	**0.0393**	**9.4000e-004**	**0.0403**		**140.4437**	**140.4437**	**5.8300e-003**		**140.5895**

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697		3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**		**1.7949**	**1.7949**		**1.6697**	**1.6697**		**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0802	0.0690	0.5896	1.3700e-003	0.1483	9.8000e-004	0.1493	0.0393	9.1000e-004	0.0402		136.3132	136.3132	5.1200e-003		136.4411
Total	**0.0802**	**0.0690**	**0.5896**	**1.3700e-003**	**0.1483**	**9.8000e-004**	**0.1493**	**0.0393**	**9.1000e-004**	**0.0402**		**136.3132**	**136.3132**	**5.1200e-003**		**136.4411**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697	0.0000	3,816.8994	3,816.8994	1.0618		3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**		**1.7949**	**1.7949**		**1.6697**	**1.6697**	**0.0000**	**3,816.8994**	**3,816.8994**	**1.0618**		**3,843.4451**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0802	0.0690	0.5896	1.3700e-003	0.1483	9.8000e-004	0.1493	0.0393	9.1000e-004	0.0402		136.3132	136.3132	5.1200e-003		136.4411
Total	**0.0802**	**0.0690**	**0.5896**	**1.3700e-003**	**0.1483**	**9.8000e-004**	**0.1493**	**0.0393**	**9.1000e-004**	**0.0402**		**136.3132**	**136.3132**	**5.1200e-003**		**136.4411**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**		**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0962	0.0828	0.7075	1.6400e-003	0.1780	1.1800e-003	0.1791	0.0472	1.0900e-003	0.0483		163.5759	163.5759	6.1400e-003		163.7294
Total	**0.0962**	**0.0828**	**0.7075**	**1.6400e-003**	**0.1780**	**1.1800e-003**	**0.1791**	**0.0472**	**1.0900e-003**	**0.0483**		**163.5759**	**163.5759**	**6.1400e-003**		**163.7294**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0962	0.0828	0.7075	1.6400e-003	0.1780	1.1800e-003	0.1791	0.0472	1.0900e-003	0.0483		163.5759	163.5759	6.1400e-003		163.7294
Total	**0.0962**	**0.0828**	**0.7075**	**1.6400e-003**	**0.1780**	**1.1800e-003**	**0.1791**	**0.0472**	**1.0900e-003**	**0.0483**		**163.5759**	**163.5759**	**6.1400e-003**		**163.7294**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		158.5129	158.5129	5.2400e-003		158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**158.5129**	**158.5129**	**5.2400e-003**		**158.6439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		158.5129	158.5129	5.2400e-003		158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**158.5129**	**158.5129**	**5.2400e-003**		**158.6439**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536		176.1254	176.1254	5.8200e-003		176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**		**176.1254**	**176.1254**	**5.8200e-003**		**176.2710**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536		176.1254	176.1254	5.8200e-003		176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**		**176.1254**	**176.1254**	**5.8200e-003**		**176.2710**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0910	0.0724	0.6255	1.7100e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		170.1228	170.1228	5.1700e-003		170.2520
Total	**0.0910**	**0.0724**	**0.6255**	**1.7100e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**170.1228**	**170.1228**	**5.1700e-003**		**170.2520**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0910	0.0724	0.6255	1.7100e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		170.1228	170.1228	5.1700e-003		170.2520
Total	**0.0910**	**0.0724**	**0.6255**	**1.7100e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**170.1228**	**170.1228**	**5.1700e-003**		**170.2520**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0856	0.0651	0.5726	1.6500e-003	0.1977	1.1900e-003	0.1989	0.0524	1.1000e-003	0.0535		164.0423	164.0423	4.6300e-003		164.1581
Total	**0.0856**	**0.0651**	**0.5726**	**1.6500e-003**	**0.1977**	**1.1900e-003**	**0.1989**	**0.0524**	**1.1000e-003**	**0.0535**		**164.0423**	**164.0423**	**4.6300e-003**		**164.1581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0856	0.0651	0.5726	1.6500e-003	0.1977	1.1900e-003	0.1989	0.0524	1.1000e-003	0.0535		164.0423	164.0423	4.6300e-003		164.1581
Total	**0.0856**	**0.0651**	**0.5726**	**1.6500e-003**	**0.1977**	**1.1900e-003**	**0.1989**	**0.0524**	**1.1000e-003**	**0.0535**		**164.0423**	**164.0423**	**4.6300e-003**		**164.1581**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.1533	96.3719	29.4836	0.2082	5.0152	0.2673	5.2825	1.4446	0.2556	1.7002		22,197.7056	22,197.7056	1.3751		22,232.0834
Worker	11.1366	8.4740	74.5271	0.2143	25.7336	0.1549	25.8885	6.8251	0.1428	6.9679		21,350.1046	21,350.1046	0.6026		21,365.1702
Total	**14.2899**	**104.8460**	**104.0107**	**0.4225**	**30.7488**	**0.4222**	**31.1709**	**8.2696**	**0.3984**	**8.6681**		**43,547.8102**	**43,547.8102**	**1.9777**		**43,597.2536**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.1533	96.3719	29.4836	0.2082	5.0152	0.2673	5.2825	1.4446	0.2556	1.7002		22,197.7056	22,197.7056	1.3751		22,232.0834
Worker	11.1366	8.4740	74.5271	0.2143	25.7336	0.1549	25.8885	6.8251	0.1428	6.9679		21,350.1046	21,350.1046	0.6026		21,365.1702
Total	**14.2899**	**104.8460**	**104.0107**	**0.4225**	**30.7488**	**0.4222**	**31.1709**	**8.2696**	**0.3984**	**8.6681**		**43,547.8102**	**43,547.8102**	**1.9777**		**43,597.2536**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.4095	79.5553	25.7195	0.2044	5.0161	0.1231	5.1391	1.4449	0.1177	1.5625		21,825.0594	21,825.0594	1.2194		21,855.5453
Worker	10.4826	7.6161	67.9992	0.2062	25.7336	0.1509	25.8845	6.8251	0.1391	6.9641		20,549.4202	20,549.4202	0.5374		20,562.8560
Total	**12.8921**	**87.1714**	**93.7187**	**0.4106**	**30.7497**	**0.2739**	**31.0236**	**8.2699**	**0.2567**	**8.5267**		**42,374.4796**	**42,374.4796**	**1.7569**		**42,418.4013**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.4095	79.5553	25.7195	0.2044	5.0161	0.1231	5.1391	1.4449	0.1177	1.5625		21,825.0594	21,825.0594	1.2194		21,855.5453
Worker	10.4826	7.6161	67.9992	0.2062	25.7336	0.1509	25.8845	6.8251	0.1391	6.9641		20,549.4202	20,549.4202	0.5374		20,562.8560
Total	**12.8921**	**87.1714**	**93.7187**	**0.4106**	**30.7497**	**0.2739**	**31.0236**	**8.2699**	**0.2567**	**8.5267**		**42,374.4796**	**42,374.4796**	**1.7569**		**42,418.4013**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.2835	77.7698	24.1970	0.2031	5.0170	0.1134	5.1304	1.4452	0.1084	1.5536		21,704.9531	21,704.9531	1.2259		21,735.6007
Worker	9.9047	6.8717	62.6430	0.1981	25.7336	0.1473	25.8809	6.8251	0.1357	6.9608		19,750.5871	19,750.5871	0.4818		19,762.6330
Total	**12.1882**	**84.6415**	**86.8401**	**0.4012**	**30.7506**	**0.2607**	**31.0112**	**8.2703**	**0.2441**	**8.5144**		**41,455.5402**	**41,455.5402**	**1.7077**		**41,498.2337**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.2835	77.7698	24.1970	0.2031	5.0170	0.1134	5.1304	1.4452	0.1084	1.5536		21,704.9531	21,704.9531	1.2259		21,735.6007
Worker	9.9047	6.8717	62.6430	0.1981	25.7336	0.1473	25.8809	6.8251	0.1357	6.9608		19,750.5871	19,750.5871	0.4818		19,762.6330
Total	**12.1882**	**84.6415**	**86.8401**	**0.4012**	**30.7506**	**0.2607**	**31.0112**	**8.2703**	**0.2441**	**8.5144**		**41,455.5402**	**41,455.5402**	**1.7077**		**41,498.2337**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.1771	76.1266	22.9970	0.2018	5.0178	0.1045	5.1222	1.4455	0.0999	1.5453		21,591.6290	21,591.6290	1.2315		21,622.4156
Worker	9.3906	6.2209	57.7107	0.1902	25.7336	0.1442	25.8778	6.8251	0.1328	6.9579		18,959.1055	18,959.1055	0.4334		18,969.9392
Total	**11.5676**	**82.3475**	**80.7077**	**0.3919**	**30.7514**	**0.2486**	**31.0000**	**8.2706**	**0.2327**	**8.5032**		**40,550.7345**	**40,550.7345**	**1.6648**		**40,592.3548**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.1771	76.1266	22.9970	0.2018	5.0178	0.1045	5.1222	1.4455	0.0999	1.5453		21,591.6290	21,591.6290	1.2315		21,622.4156
Worker	9.3906	6.2209	57.7107	0.1902	25.7336	0.1442	25.8778	6.8251	0.1328	6.9579		18,959.1055	18,959.1055	0.4334		18,969.9392
Total	**11.5676**	**82.3475**	**80.7077**	**0.3919**	**30.7514**	**0.2486**	**31.0000**	**8.2706**	**0.2327**	**8.5032**		**40,550.7345**	**40,550.7345**	**1.6648**		**40,592.3548**

3.5 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0841	74.6585	21.9962	0.2006	5.0185	0.0970	5.1154	1.4458	0.0927	1.5384		21,485.5848	21,485.5848	1.2363		21,516.4921
Worker	8.9471	5.6678	53.5070	0.1831	25.7336	0.1396	25.8732	6.8251	0.1286	6.9537		18,254.9373	18,254.9373	0.3923		18,264.7452
Total	**11.0313**	**80.3264**	**75.5031**	**0.3837**	**30.7521**	**0.2366**	**30.9887**	**8.2708**	**0.2213**	**8.4921**		**39,740.5220**	**39,740.5220**	**1.6286**		**39,781.2374**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0841	74.6585	21.9962	0.2006	5.0185	0.0970	5.1154	1.4458	0.0927	1.5384		21,485.5848	21,485.5848	1.2363		21,516.4921
Worker	8.9471	5.6678	53.5070	0.1831	25.7336	0.1396	25.8732	6.8251	0.1286	6.9537		18,254.9373	18,254.9373	0.3923		18,264.7452
Total	**11.0313**	**80.3264**	**75.5031**	**0.3837**	**30.7521**	**0.2366**	**30.9887**	**8.2708**	**0.2213**	**8.4921**		**39,740.5220**	**39,740.5220**	**1.6286**		**39,781.2374**

3.5 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0014	73.3286	21.0501	0.1996	5.0191	0.0907	5.1098	1.4460	0.0867	1.5327		21,388.5443	21,388.5443	1.2393		21,419.5279
Worker	8.4966	5.1556	49.5899	0.1767	25.7336	0.1318	25.8654	6.8251	0.1213	6.9464		17,624.4802	17,624.4802	0.3541		17,633.3321
Total	**10.4980**	**78.4842**	**70.6400**	**0.3763**	**30.7527**	**0.2225**	**30.9752**	**8.2710**	**0.2080**	**8.4791**		**39,013.0245**	**39,013.0245**	**1.5934**		**39,052.8600**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	2.0014	73.3286	21.0501	0.1996	5.0191	0.0907	5.1098	1.4460	0.0867	1.5327		21,388.5443	21,388.5443	1.2393		21,419.5279
Worker	8.4966	5.1556	49.5899	0.1767	25.7336	0.1318	25.8654	6.8251	0.1213	6.9464		17,624.4802	17,624.4802	0.3541		17,633.3321
Total	**10.4980**	**78.4842**	**70.6400**	**0.3763**	**30.7527**	**0.2225**	**30.9752**	**8.2710**	**0.2080**	**8.4791**		**39,013.0245**	**39,013.0245**	**1.5934**		**39,052.8600**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9332	72.1727	20.3693	0.1986	5.0197	0.0853	5.1050	1.4462	0.0816	1.5278		21,305.6010	21,305.6010	1.2414		21,336.6370
Worker	8.0122	4.7032	46.2247	0.1711	25.7336	0.1224	25.8560	6.8251	0.1126	6.9377		17,065.9899	17,065.9899	0.3221		17,074.0424
Total	**9.9454**	**76.8758**	**66.5940**	**0.3697**	**30.7533**	**0.2077**	**30.9610**	**8.2712**	**0.1942**	**8.4654**		**38,371.5909**	**38,371.5909**	**1.5635**		**38,410.6794**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9332	72.1727	20.3693	0.1986	5.0197	0.0853	5.1050	1.4462	0.0816	1.5278		21,305.6010	21,305.6010	1.2414		21,336.6370
Worker	8.0122	4.7032	46.2247	0.1711	25.7336	0.1224	25.8560	6.8251	0.1126	6.9377		17,065.9899	17,065.9899	0.3221		17,074.0424
Total	**9.9454**	**76.8758**	**66.5940**	**0.3697**	**30.7533**	**0.2077**	**30.9610**	**8.2712**	**0.1942**	**8.4654**		**38,371.5909**	**38,371.5909**	**1.5635**		**38,410.6794**

3.5 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8712	71.0456	19.7880	0.1978	5.0202	0.0798	5.1000	1.4464	0.0762	1.5226		21,224.3974	21,224.3974	1.2422		21,255.4516
Worker	7.4945	4.2837	42.9946	0.1661	25.7336	0.1135	25.8471	6.8251	0.1044	6.9295		16,571.8953	16,571.8953	0.2914		16,579.1803
Total	**9.3657**	**75.3292**	**62.7826**	**0.3638**	**30.7538**	**0.1932**	**30.9470**	**8.2714**	**0.1806**	**8.4521**		**37,796.2926**	**37,796.2926**	**1.5336**		**37,834.6319**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8712	71.0456	19.7880	0.1978	5.0202	0.0798	5.1000	1.4464	0.0762	1.5226		21,224.3974	21,224.3974	1.2422		21,255.4516
Worker	7.4945	4.2837	42.9946	0.1661	25.7336	0.1135	25.8471	6.8251	0.1044	6.9295		16,571.8953	16,571.8953	0.2914		16,579.1803
Total	**9.3657**	**75.3292**	**62.7826**	**0.3638**	**30.7538**	**0.1932**	**30.9470**	**8.2714**	**0.1806**	**8.4521**		**37,796.2926**	**37,796.2926**	**1.5336**		**37,834.6319**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8234	70.1109	19.3469	0.1970	5.0207	0.0756	5.0963	1.4465	0.0723	1.5188		21,159.6440	21,159.6440	1.2428		21,190.7136
Worker	6.9831	3.8996	40.1042	0.1617	25.7336	0.1053	25.8389	6.8251	0.0969	6.9219		16,136.7299	16,136.7299	0.2641		16,143.3334
Total	**8.8064**	**74.0105**	**59.4511**	**0.3587**	**30.7543**	**0.1809**	**30.9352**	**8.2716**	**0.1691**	**8.4407**		**37,296.3739**	**37,296.3739**	**1.5069**		**37,334.0470**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8234	70.1109	19.3469	0.1970	5.0207	0.0756	5.0963	1.4465	0.0723	1.5188		21,159.6440	21,159.6440	1.2428		21,190.7136
Worker	6.9831	3.8996	40.1042	0.1617	25.7336	0.1053	25.8389	6.8251	0.0969	6.9219		16,136.7299	16,136.7299	0.2641		16,143.3334
Total	**8.8064**	**74.0105**	**59.4511**	**0.3587**	**30.7543**	**0.1809**	**30.9352**	**8.2716**	**0.1691**	**8.4407**		**37,296.3739**	**37,296.3739**	**1.5069**		**37,334.0470**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7843	69.2727	19.0088	0.1965	5.0210	0.0719	5.0930	1.4467	0.0688	1.5154		21,110.1988	21,110.1988	1.2431		21,141.2752
Worker	6.4311	3.5326	37.3073	0.1578	25.7336	0.0980	25.8316	6.8251	0.0902	6.9152		15,755.3489	15,755.3489	0.2381		15,761.3003
Total	**8.2154**	**72.8053**	**56.3161**	**0.3543**	**30.7546**	**0.1700**	**30.9246**	**8.2717**	**0.1589**	**8.4307**		**36,865.5477**	**36,865.5477**	**1.4811**		**36,902.5754**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7843	69.2727	19.0088	0.1965	5.0210	0.0719	5.0930	1.4467	0.0688	1.5154		21,110.1988	21,110.1988	1.2431		21,141.2752
Worker	6.4311	3.5326	37.3073	0.1578	25.7336	0.0980	25.8316	6.8251	0.0902	6.9152		15,755.3489	15,755.3489	0.2381		15,761.3003
Total	**8.2154**	**72.8053**	**56.3161**	**0.3543**	**30.7546**	**0.1700**	**30.9246**	**8.2717**	**0.1589**	**8.4307**		**36,865.5477**	**36,865.5477**	**1.4811**		**36,902.5754**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7528	68.4846	18.7699	0.1961	5.0214	0.0686	5.0900	1.4468	0.0655	1.5123		21,074.9305	21,074.9305	1.2429		21,106.0042
Worker	5.9211	3.2110	34.8271	0.1545	25.7336	0.0913	25.8249	6.8251	0.0840	6.9090		15,423.1075	15,423.1075	0.2151		15,428.4837
Total	**7.6740**	**71.6955**	**53.5970**	**0.3506**	**30.7550**	**0.1599**	**30.9149**	**8.2719**	**0.1495**	**8.4214**		**36,498.0380**	**36,498.0380**	**1.4580**		**36,534.4878**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7528	68.4846	18.7699	0.1961	5.0214	0.0686	5.0900	1.4468	0.0655	1.5123		21,074.9305	21,074.9305	1.2429		21,106.0042
Worker	5.9211	3.2110	34.8271	0.1545	25.7336	0.0913	25.8249	6.8251	0.0840	6.9090		15,423.1075	15,423.1075	0.2151		15,428.4837
Total	**7.6740**	**71.6955**	**53.5970**	**0.3506**	**30.7550**	**0.1599**	**30.9149**	**8.2719**	**0.1495**	**8.4214**		**36,498.0380**	**36,498.0380**	**1.4580**		**36,534.4878**

3.5 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7286	67.8091	18.5746	0.1958	5.0217	0.0659	5.0875	1.4469	0.0629	1.5098		21,050.1244	21,050.1244	1.2439		21,081.2229
Worker	5.4961	2.9454	32.7441	0.1516	25.7336	0.0853	25.8189	6.8251	0.0784	6.9035		15,136.3351	15,136.3351	0.1959		15,141.2324
Total	**7.2247**	**70.7545**	**51.3186**	**0.3474**	**30.7553**	**0.1511**	**30.9064**	**8.2720**	**0.1414**	**8.4133**		**36,186.4595**	**36,186.4595**	**1.4398**		**36,222.4553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7286	67.8091	18.5746	0.1958	5.0217	0.0659	5.0875	1.4469	0.0629	1.5098		21,050.1244	21,050.1244	1.2439		21,081.2229
Worker	5.4961	2.9454	32.7441	0.1516	25.7336	0.0853	25.8189	6.8251	0.0784	6.9035		15,136.3351	15,136.3351	0.1959		15,141.2324
Total	**7.2247**	**70.7545**	**51.3186**	**0.3474**	**30.7553**	**0.1511**	**30.9064**	**8.2720**	**0.1414**	**8.4133**		**36,186.4595**	**36,186.4595**	**1.4398**		**36,222.4553**

3.5 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7064	67.1981	18.4019	0.1956	5.0219	0.0634	5.0853	1.4470	0.0605	1.5075		21,032.9510	21,032.9510	1.2433		21,064.0331
Worker	5.1604	2.7344	30.8954	0.1491	25.7336	0.0798	25.8134	6.8251	0.0734	6.8984		14,889.6202	14,889.6202	0.1790		14,894.0956
Total	**6.8668**	**69.9325**	**49.2973**	**0.3446**	**30.7555**	**0.1431**	**30.8987**	**8.2721**	**0.1339**	**8.4060**		**35,922.5712**	**35,922.5712**	**1.4223**		**35,958.1287**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

3.5 Building Construction - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.7064	67.1981	18.4019	0.1956	5.0219	0.0634	5.0853	1.4470	0.0605	1.5075		21,032.9510	21,032.9510	1.2433		21,064.0331
Worker	5.1604	2.7344	30.8954	0.1491	25.7336	0.0798	25.8134	6.8251	0.0734	6.8984		14,889.6202	14,889.6202	0.1790		14,894.0956
Total	**6.8668**	**69.9325**	**49.2973**	**0.3446**	**30.7555**	**0.1431**	**30.8987**	**8.2721**	**0.1339**	**8.4060**		**35,922.5712**	**35,922.5712**	**1.4223**		**35,958.1287**

3.5 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

3.5 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

3.5 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

3.5 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

3.5 Building Construction - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

3.5 Building Construction - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6867	66.6713	18.2664	0.1954	5.0222	0.0613	5.0835	1.4471	0.0586	1.5057		21,021.2657	21,021.2657	1.2416		21,052.3058
Worker	4.8745	2.5700	29.3328	0.1470	25.7336	0.0749	25.8085	6.8251	0.0689	6.8939		14,679.9295	14,679.9295	0.1649		14,684.0518
Total	**6.5611**	**69.2414**	**47.5992**	**0.3424**	**30.7558**	**0.1362**	**30.8919**	**8.2721**	**0.1274**	**8.3996**		**35,701.1951**	**35,701.1951**	**1.4065**		**35,736.3577**

3.5 Building Construction - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1970	6.8903	16.1185	0.0310		0.0737	0.0737		0.0737	0.0737		2,897.5471	2,897.5471	0.1041		2,900.1503
Total	**1.1970**	**6.8903**	**16.1185**	**0.0310**		**0.0737**	**0.0737**		**0.0737**	**0.0737**		**2,897.5471**	**2,897.5471**	**0.1041**		**2,900.1503**

3.5 Building Construction - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6466	64.8342	18.0790	0.1959	5.0227	0.0552	5.0779	1.4473	0.0527	1.5000		21,102.8233	21,102.8233	1.2425		21,133.8866
Worker	3.8666	2.0546	24.5747	0.1405	25.7336	0.0581	25.7917	6.8251	0.0534	6.8785		14,039.0045	14,039.0045	0.1226		14,042.0695
Total	**5.5132**	**66.8888**	**42.6537**	**0.3364**	**30.7563**	**0.1133**	**30.8696**	**8.2723**	**0.1062**	**8.3785**		**35,141.8278**	**35,141.8278**	**1.3651**		**35,175.9560**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1970	6.8903	16.1185	0.0310		0.0737	0.0737		0.0737	0.0737	0.0000	2,897.5471	2,897.5471	0.1041		2,900.1503
Total	**1.1970**	**6.8903**	**16.1185**	**0.0310**		**0.0737**	**0.0737**		**0.0737**	**0.0737**	**0.0000**	**2,897.5471**	**2,897.5471**	**0.1041**		**2,900.1503**

3.5 Building Construction - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6466	64.8342	18.0790	0.1959	5.0227	0.0552	5.0779	1.4473	0.0527	1.5000		21,102.8233	21,102.8233	1.2425		21,133.8866
Worker	3.8666	2.0546	24.5747	0.1405	25.7336	0.0581	25.7917	6.8251	0.0534	6.8785		14,039.0045	14,039.0045	0.1226		14,042.0695
Total	**5.5132**	**66.8888**	**42.6537**	**0.3364**	**30.7563**	**0.1133**	**30.8696**	**8.2723**	**0.1062**	**8.3785**		**35,141.8278**	**35,141.8278**	**1.3651**		**35,175.9560**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0223	0.0118	0.1416	8.1000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		80.9009	80.9009	7.1000e-004		80.9186
Total	**0.0223**	**0.0118**	**0.1416**	**8.1000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**80.9009**	**80.9009**	**7.1000e-004**		**80.9186**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0223	0.0118	0.1416	8.1000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		80.9009	80.9009	7.1000e-004		80.9186
Total	**0.0223**	**0.0118**	**0.1416**	**8.1000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**80.9009**	**80.9009**	**7.1000e-004**		**80.9186**

3.6 Paving - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0223	0.0118	0.1416	8.1000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		80.9009	80.9009	7.1000e-004		80.9186
Total	**0.0223**	**0.0118**	**0.1416**	**8.1000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**80.9009**	**80.9009**	**7.1000e-004**		**80.9186**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0223	0.0118	0.1416	8.1000e-004	0.1483	3.3000e-004	0.1486	0.0393	3.1000e-004	0.0396		80.9009	80.9009	7.1000e-004		80.9186
Total	**0.0223**	**0.0118**	**0.1416**	**8.1000e-004**	**0.1483**	**3.3000e-004**	**0.1486**	**0.0393**	**3.1000e-004**	**0.0396**		**80.9009**	**80.9009**	**7.1000e-004**		**80.9186**

3.7 Architectural Coating - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.7739	0.4112	4.9187	0.0281	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,809.9583	2,809.9583	0.0245		2,810.5717
Total	**0.7739**	**0.4112**	**4.9187**	**0.0281**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,809.9583**	**2,809.9583**	**0.0245**		**2,810.5717**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.7739	0.4112	4.9187	0.0281	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,809.9583	2,809.9583	0.0245		2,810.5717
Total	**0.7739**	**0.4112**	**4.9187**	**0.0281**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,809.9583**	**2,809.9583**	**0.0245**		**2,810.5717**

3.7 Architectural Coating - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.7739	0.4112	4.9187	0.0281	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,809.9583	2,809.9583	0.0245		2,810.5717
Total	**0.7739**	**0.4112**	**4.9187**	**0.0281**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,809.9583**	**2,809.9583**	**0.0245**		**2,810.5717**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**0.1149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.7739	0.4112	4.9187	0.0281	5.1507	0.0116	5.1623	1.3661	0.0107	1.3768		2,809.9583	2,809.9583	0.0245		2,810.5717
Total	**0.7739**	**0.4112**	**4.9187**	**0.0281**	**5.1507**	**0.0116**	**5.1623**	**1.3661**	**0.0107**	**1.3768**		**2,809.9583**	**2,809.9583**	**0.0245**		**2,810.5717**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	55.1813	275.2493	635.1896	3.1046	423.0173	1.4135	424.4308	112.7977	1.3145	114.1122		316,051.4036	316,051.4036	9.4507		316,287.6701
Unmitigated	55.1813	275.2493	635.1896	3.1046	423.0173	1.4135	424.4308	112.7977	1.3145	114.1122		316,051.4036	316,051.4036	9.4507		316,287.6701

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,497.61	2,713.64	2300.53	6,354,699	6,354,699
Apartments Mid Rise	2,979.20	2,862.72	2625.28	7,401,015	7,401,015
Condo/Townhouse	34.86	34.02	29.04	86,181	86,181
General Light Industry	2,613.05	494.87	254.93	6,513,510	6,513,510
Industrial Park	822.33	299.80	87.89	1,905,069	1,905,069
Government (Civic Center)	4,866.46	0.00	0.00	8,162,312	8,162,312
Mobile Home Park	39.92	40.00	34.88	99,658	99,658
Single Family Housing	866.32	901.81	784.42	2,184,951	2,184,951
Strip Mall	24,482.37	23,222.90	11285.53	28,521,953	28,521,953
Office Park	54,380.90	7,809.52	3619.04	96,566,590	96,566,590
Total	93,583.02	38,379.27	21,021.55	157,795,938	157,795,938

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Apartments Mid Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Condo/Townhouse	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Industrial Park	13.00	5.00	5.00	59.00	28.00	13.00	79	19	2
Government (Civic Center)	13.00	5.00	5.00	75.00	20.00	5.00	50	34	16
Mobile Home Park	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Strip Mall	13.00	5.00	5.00	16.60	64.40	19.00	45	40	15
Office Park	13.00	5.00	5.00	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Apartments Mid Rise	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Condo/Townhouse	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
General Light Industry	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Industrial Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Government (Civic Center)	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Mobile Home Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Single Family Housing	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Strip Mall	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535
Office Park	0.617814	0.024228	0.201503	0.100888	0.010115	0.003910	0.012592	0.020425	0.002295	0.001008	0.004008	0.000680	0.000535

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055
NaturalGas Unmitigated	3.7590	34.0011	27.4486	0.2050		2.5971	2.5971		2.5971	2.5971		41,006.8225	41,006.8225	0.7860	0.7518	41,250.5055

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	10590	0.1142	0.9759	0.4153	6.2300e-003		0.0789	0.0789		0.0789	0.0789		1,245.8869	1,245.8869	0.0239	0.0228	1,253.2906
Apartments Mid Rise	10604	0.1144	0.9772	0.4158	6.2400e-003		0.0790	0.0790		0.0790	0.0790		1,247.5338	1,247.5338	0.0239	0.0229	1,254.9473
Condo/Townhouse	307.776	3.3200e-003	0.0284	0.0121	1.8000e-004		2.2900e-003	2.2900e-003		2.2900e-003	2.2900e-003		36.2089	36.2089	6.9000e-004	6.6000e-004	36.4241
General Light Industry	27095.5	0.2922	2.6564	2.2314	0.0159		0.2019	0.2019		0.2019	0.2019		3,187.7073	3,187.7073	0.0611	0.0584	3,206.6503
Government (Civic Center)	7817.24	0.0843	0.7664	0.6438	4.6000e-003		0.0583	0.0583		0.0583	0.0583		919.6748	919.6748	0.0176	0.0169	925.1400
Industrial Park	5399.86	0.0582	0.5294	0.4447	3.1800e-003		0.0402	0.0402		0.0402	0.0402		635.2774	635.2774	0.0122	0.0117	639.0525
Mobile Home Park	372.468	4.0200e-003	0.0343	0.0146	2.2000e-004		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003		43.8197	43.8197	8.4000e-004	8.0000e-004	44.0801
Office Park	275538	2.9715	27.0135	22.6914	0.1621		2.0530	2.0530		2.0530	2.0530		32,416.2218	32,416.2218	0.6213	0.5943	32,608.8552
Single Family Housing	7246.36	0.0782	0.6678	0.2842	4.2600e-003		0.0540	0.0540		0.0540	0.0540		852.5135	852.5135	0.0163	0.0156	857.5796
Strip Mall	3586.82	0.0387	0.3517	0.2954	2.1100e-003		0.0267	0.0267		0.0267	0.0267		421.9784	421.9784	8.0900e-003	7.7400e-003	424.4860
Total		**3.7590**	**34.0011**	**27.4486**	**0.2050**		**2.5971**	**2.5971**		**2.5971**	**2.5971**		**41,006.8225**	**41,006.8225**	**0.7860**	**0.7518**	**41,250.5055**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	10.59	0.1142	0.9759	0.4153	6.2300e-003		0.0789	0.0789		0.0789	0.0789		1,245.8869	1,245.8869	0.0239	0.0228	1,253.2906
Apartments Mid Rise	10.604	0.1144	0.9772	0.4158	6.2400e-003		0.0790	0.0790		0.0790	0.0790		1,247.5338	1,247.5338	0.0239	0.0229	1,254.9473
Condo/Townhouse	0.307776	3.3200e-003	0.0284	0.0121	1.8000e-004		2.2900e-003	2.2900e-003		2.2900e-003	2.2900e-003		36.2089	36.2089	6.9000e-004	6.6000e-004	36.4241
General Light Industry	27.0955	0.2922	2.6564	2.2314	0.0159		0.2019	0.2019		0.2019	0.2019		3,187.7073	3,187.7073	0.0611	0.0584	3,206.6503
Government (Civic Center)	7.81724	0.0843	0.7664	0.6438	4.6000e-003		0.0583	0.0583		0.0583	0.0583		919.6748	919.6748	0.0176	0.0169	925.1400
Industrial Park	5.39986	0.0582	0.5294	0.4447	3.1800e-003		0.0402	0.0402		0.0402	0.0402		635.2774	635.2774	0.0122	0.0117	639.0525
Mobile Home Park	0.372468	4.0200e-003	0.0343	0.0146	2.2000e-004		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003		43.8197	43.8197	8.4000e-004	8.0000e-004	44.0801
Office Park	275.538	2.9715	27.0135	22.6914	0.1621		2.0530	2.0530		2.0530	2.0530		32,416.2218	32,416.2218	0.6213	0.5943	32,608.8552
Single Family Housing	7.24636	0.0782	0.6678	0.2842	4.2600e-003		0.0540	0.0540		0.0540	0.0540		852.5135	852.5135	0.0163	0.0156	857.5796
Strip Mall	3.58682	0.0387	0.3517	0.2954	2.1100e-003		0.0267	0.0267		0.0267	0.0267		421.9784	421.9784	8.0900e-003	7.7400e-003	424.4860
Total		**3.7590**	**34.0011**	**27.4486**	**0.2050**		**2.5971**	**2.5971**		**2.5971**	**2.5971**		**41,006.8225**	**41,006.8225**	**0.7860**	**0.7518**	**41,250.5055**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392
Unmitigated	170.5857	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286	0.0000	139.7603	139.7603	0.1352	0.0000	143.1392

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.6480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	149.5924					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3452	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286		139.7603	139.7603	0.1352		143.1392
Total	**170.5857**	**0.8891**	**77.1605**	**4.1100e-003**		**0.4286**	**0.4286**		**0.4286**	**0.4286**	**0.0000**	**139.7603**	**139.7603**	**0.1352**	**0.0000**	**143.1392**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.6480					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	149.5924					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3452	0.8891	77.1605	4.1100e-003		0.4286	0.4286		0.4286	0.4286		139.7603	139.7603	0.1352		143.1392
Total	**170.5857**	**0.8891**	**77.1605**	**4.1100e-003**		**0.4286**	**0.4286**		**0.4286**	**0.4286**	**0.0000**	**139.7603**	**139.7603**	**0.1352**	**0.0000**	**143.1392**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Plan Morro Bay
CalEEMod Calculations

Table LU-2 (Excerpt)			
Land Use Designation	**Acres (approximate)**	**Total Estimated Dwelling Units -2040**	**Non-residential Square Feet -2040**
Residential	752	6,521	—
Commercial	281	540	10,155,892
Industrial	37	—	799,468
Waterfront Commercial/ Industrial	6	—	256,760
Mixed Use	34	271	1,178,119
Open Space & Agriculture	7,570	15	—
Public/Institutional	153	—	371,651
Total (2040)	8,833	7,347	12,761,890
Existing (2016) Totals	8,833	6,414	6,778,070
Change, 2016-2040	—	**933**	**5,983,820**

Project Net Change				
	Acres*	**DU**	**Non-residential square feet**	**Increase in Non-residential acreage**
Residential	752	828		
Commercial	281	69	4,761,915	109
Industrial	37		374,856	9
Waterfront Commercial/	6		120,390	3
Industrial			-	-
Mixed Use	34	34	552,399	13
Open Space & Agriculture	7,570			
Public/Institutional	153		174,260	4
				137

*Calculated by taking total change and weighting for each specific use (i.e., Total Change * specific use amount in 2040/ total amount in 2040)*
**No change in acres*

Residential Unit Calculations							
				HOUSING UNIT TYPES			
Source of Data		**Total**	**Single Detached**	**Single Attached**	**Two to Four**	**Five Plus**	**Mobile Homes**
2016 DOF, E-5 Report*	**Existing Dwelling Units**	6,414	4,585	369	446	528	486
Table LU-2	**Residential Land Use Designation Net Change**	107	76	6	7	9	8
Table LU-2	**Commercial + Mixed Use + Ag Designations Net Change**	811			371	440	
Table LU-2	**Ag Designation Net Change**	15	15				
	Total (entered into CalEEMod)	933	**91**	**6**	**379**	**448**	**8**
	Land Use Designation Assigned in CalEEMod		Single-family housing	Condo/townhouse	apartments low-rise	mid-rise apartments	mobile home community

**http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/*

Non-Residential Square Footage Calculations	
	Non-residential Area (square feet) Net Change
Commercial	4,761,915
Industrial	374,856
Waterfront Commercial/ Industrial	120,390
Mixed Use	552,399
Public/Institutional	174,260
Calculated by taking total change and weighting for each specific use	
*(i.e., Total Change * specific land use amount in 2040/ total amount in 2040)*	

Table 7.1
Morro Bay Existing On-The-Ground Land Use

Land Use Designation	Sum of Acres	Percent of Area
Single-Family Residential	605.53	14.03%
Multiple-Family Residential	39.51	0.92%
Downtown	31.27	0.72%
Commercial Retail/Office	63.34	1.47%
Commercial Service/Industrial	74.61	1.73%
School	75.93	1.76%
Major Public Facility	99.97	2.32%
Public Facility/Public Land	26.46	0.61%
Cultural Facility/Religious Facility/Event Center	19.42	0.45%
Visitor-Serving	19.79	0.46%
Community Park/Regional Park/Golf Course/Other Recreation	388.10	8.99%
Open Space Area/Conservation Area/Riparian Area	397.59	9.21%
State Park/Beach	2,139.06	49.55%
Undeveloped	54.02	1.25%
Agriculture (Other)	216.82	5.02%
Agriculture (Grazing/Ranchland)	54.14	1.25%
Road/Other	11.11	0.26%
Total	4,316.70	100.00%

Source: San Luis Obispo Council of Governments 2016

CalEEMod Assumptions

Project emissions were modeled as the net change between existing conditions and 2040 development capacity.

Determining dwelling units, square footages, and acreages for input into CalEEMod

Residential

- Dwelling units. The net change in dwelling units (du) resulting from the project (933 units), also referred to as "project" units, was allocated to different housing types in CalEEMod (single-family housing, condo/townhouse, apartments low-rise, apartments mid-rise, and mobile home communities) using existing 2016 housing unit data provided by the Department of Finance (DOF) and reasonable assumptions, as described below.
    - The project units under the residential land use designation were determined by subtracting the number of units under the mixed-use, commercial, and open space & agriculture designations under 2040 conditions (826 du) from the total net change in dwelling units (933 du; therefore: 933 dy - 826 du = 107 du). The resulting 107 du were allocated across the different residential types by weighting each category based on 2016 DOF data (e.g., for single family detached housing (SFH), $Project_{SFH}$ du = $Project_{Total}$ du * 2016_{SFH} du/ 2016_{total} du).
    - For project units under the commercial and mixed-use designations, it was assumed that all housing would be multi-family and project dwelling units were allocated between apartments low-rise and apartments mid-rise by weighting using 2016 DOF data for two to four units (categorized as apartments low-rise for CalEEMod) and five plus units (classified as mid-rise apartments).
    - All 15 units included under the agricultural/open space designation were assumed to be single-family detached units.
- Square footages and lot acreages were kept as CalEEMod defaults.

Non-residential

- Non-residential square footage was determined by taking the project non-residential area (5,983,820 sf) and allocating the total area across the different land use designations by weighting each designation based on the 2040 total areas (e.g., for commercial, $Project_{COM}$ sf = $Project_{Total}$ sf * 2040_{COM} sf/ 2040_{total} sf).
- The various land use designations were modeled under the following CalEEMod land use sub-types:
    - Commercial = Office Park
    - Industrial = General Light Industry
    - Waterfront Commercial/Industrial = Industrial Park
    - Mixed Use = Strip Mall
    - Public/Institutional = Government (Civic Center)
- Lot acreages were kept as CalEEMod defaults.

Appendix D

Bio ESHA Report and Habitat Table

CITY OF MORRO BAY

ENVIRONMENTALLY SENSITIVE HABITAT AREA (ESHA) REVIEW AND CURRENT CONDITIONS MAPPING

Prepared for:

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MORRO BAY, CALIFORNIA 93442

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JANUARY 2018

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EXECUTIVE SUMMARY

Rincon Consultants, Inc. (Rincon), in cooperation with Michael Baker International (Michael Baker), is assisting the City of Morro Bay (City) to conduct data review and analysis of the current extent and locations of Environmentally Sensitive Habitat Area (ESHA) resources within the City's coastal zone. The goal of the review and data analysis is to assist the City in updating its Local Coastal Program (LCP), obtain mapping approval by the California Coastal Commission (Commission) as part of the City's LCP update, and provide updated maps of potential ESHA under current conditions to better aid planning staff reviewing projects that have the potential to impact ESHA.

Rincon evaluated and overlaid existing the biological resource information and previous ESHA mapping on recent aerial imagery to refine outdated mapping polygons, identify undeveloped areas or areas with no recently mapped ESHA information that have a moderate to high potential to contain ESHA habitats, and review existing data documenting presence and distribution of special status wildlife, plants, and sensitive habitats. These data sources are outlined in more detail below. Field reconnaissance surveys were also conducted for field verification.

Seventeen special status wildlife, sixteen special status plant species, and three special status vegetation communities are documented in California Natural Diversity Database (CNDDB) as occurring within the City's coastal zone. Federally designated critical habitat for south-central California coast steelhead (*Oncorhynchus mykiss*), California red-legged frog (*Rana draytonii*), Morro shoulderband snail (*Helminthoglypta walkeriana*), tidewater goby (*Eucyclogobius newberryi)*, Pacific leatherback sea turtle (*Dermochelys coriacea*), and western snowy plover (*Charadrius alexandrinus nivosus*) also occur within the City's coastal zone. Based on the existing biological resource information and previous ESHA mapping, 16 ESHA types have been determined. These areas fall into three broad categories: aquatic resources and wetland habitats; other sensitive natural communities; and breeding and overwintering sites (roosts, certain nests, and rookeries). These types are described in more detail in Section 4.2 below.

Please note that the graphic information provided portrays the various biological resource boundaries as accurately as possible, but should not be interpreted to constitute site-specific mapping throughout the Morro Bay coastal zone, as site access was limited. This data is only a cartographic representation of the existing environment, evaluated in the context of existing published datasets, and should not be used on its own without field determination procedures to establish precise boundary locations. Conditions on the ground control permit and appeal jurisdictional boundary locations, based on Coastal Act definitions, regardless of how accurate the mapped boundary may be.

1. INTRODUCTION

1.1 PURPOSE

Rincon Consultants, Inc. (Rincon), in cooperation with Michael Baker International (MBI), is assisting the City of Morro Bay (City) to conduct data review and analysis of current extent and locations of Environmentally Sensitive Habitat Area (ESHA) resources within the City's coastal zone. The goal of the review and data analysis is to assist the City in updating its Local Coastal Program (LCP), obtain mapping approval by the California Coastal Commission (Commission) as part of the City's LCP update, and provide updated maps of potential ESHA under current conditions to better aid planning staff reviewing projects that have the potential to impact ESHA.

This report summarizes the methodology used to conduct the review and data analysis, a brief description of the habitats that occur within the Morro Bay coastal zone, and a summary of the updated mapped ESHA based on current conditions within the Morro Bay coastal zone. An analysis of potential effects to ESHA resulting from climate change and associated sea level rise, and a projection of its future effects on ESHA, will be provided under separate cover.

Under the California Coastal Act of 1976 (Coastal Act), activities such as land development, public infrastructure projects, and maintenance within the coastal zone are typically subject to regulatory oversight. The authority for regulating such activities varies throughout the coastal zone. In tide lands and certain non-tidal areas of the coastal zone, the Commission has retained permit authority. In areas of the coastal zone within San Luis Obispo County, permit authority resides with the local governing agency, including San Luis Obispo County for the unincorporated areas, and the coastal municipalities of Pismo Beach, Grover Beach, and Morro Bay. Each of these local jurisdictions has an adopted LCP that provides guidance on land uses and permit requirements consistent with the applicable LCP, as well as the Coastal Act, to protect and enhance resources within the coastal zone.

1.2 REGULATORY DEFINITIONS OF ESHA, WETLANDS AND MARINE RESOURCES

Relevant Coastal Act policies concerning ESHA, wetlands, and marine resources are found in Coastal Act Sections 30107.5, 30121, 30230, 30231, and 30240 and Section 13577(b) of the California Code of Regulations (CCR).

Coastal Act Section 30107.5 Environmentally Sensitive Area

> *"Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

To ensure consistency with the Coastal Act, it is important to include the definitions of wetlands found in Coastal Act Section 30121 and CCR Section 13577(b). In addition, the Commission will also consider identification of a species or habitat as rare when there is other compelling evidence of rarity such as consideration for listing as rare, threatened or endangered under the California or Federal Endangered Species Acts and/or evidence of rarity in published academic studies.

The Coastal Act criteria for determining whether a vegetation community qualifies as an ESHA are based upon the habitat's ecological importance, including the rarity or function of the habitat. The California Department of Fish and Wildlife (CDFW) (2010) List of California Terrestrial Natural Communities provides an inventory of California's natural communities and identifies those that are considered rare because of their highly limited distribution. These rare communities may or may not contain individual species that are rare, threatened, or endangered, but would still be considered ESHA by the Commission.

Coastal Act Section 30121 Wetland

> *"Wetland" means lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*

CCR Section 13577(b) (in part)

> *Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate.*

Based on the Coastal Act definition, areas can be classified as "wetlands" within the coastal zone by exhibiting any one of the three wetland parameters used by the U.S. Army Corps to define

wetland areas (U.S. Army Corps of Engineers uses a three-parameter definition). The Coastal Act definition of wetland does not distinguish between wetlands according to their quality. Thus, under the Coastal Act, poorly functioning or degraded areas that meet the definition of wetlands are subject to wetland protection policies.

Section 30230 Marine Resources; Maintenance

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 Biological Productivity; Water Quality

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30240 Environmentally Sensitive Habitat Areas; Adjacent Developments

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas. (Amended by Ch. 285, Stats. 1991.)

2. METHODOLOGY

2.1 OVERVIEW

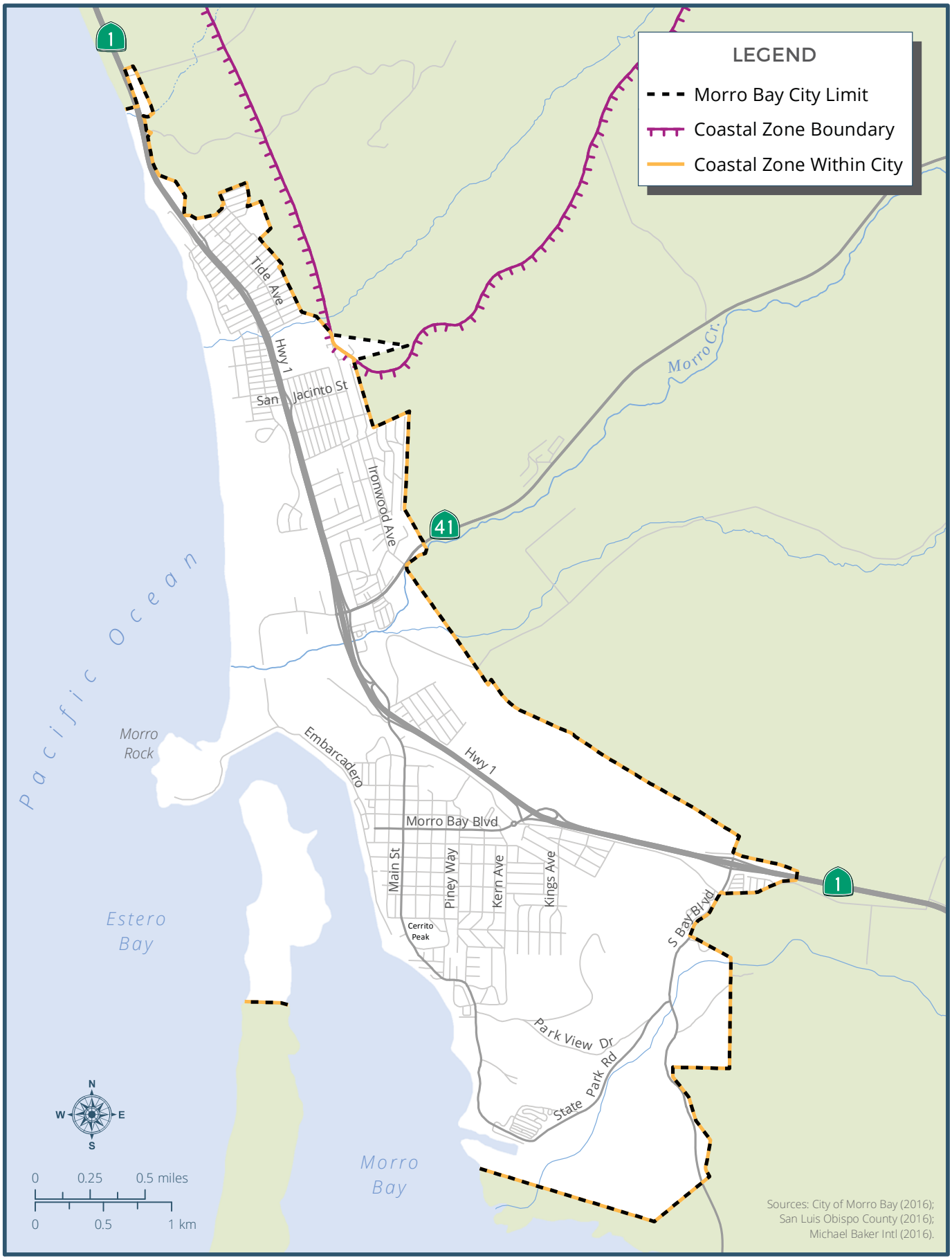
Rincon compiled and reviewed available biological resource mapping data within the City's coastal zone. Specifically, the area included in data analysis is limited to the portions of the City that are contained within the designated coastal zone between Toro Creek Road to the north and pickleweed marsh near the outlets of Chorro and Los Osos Creeks into the Morro Bay Estuary to the south (Figure 1). Rincon also reviewed ESHA mapping for adjacent jurisdictions within the County of San Luis Obispo where they adjoin the City.

Rincon evaluated and overlaid the existing biological resources information and previous ESHA mapping on recent aerial imagery to refine outdated mapping polygons, identify undeveloped areas or areas with no recently mapped ESHA information that have a moderate to high potential to contain ESHA habitats, and review existing data documenting presence and distribution of special status wildlife, plants, and sensitive habitats. These data sources are outlined in more detail below.

Rincon then performed preliminary mapping of ESHA boundaries based on desktop analysis of high-resolution, current aerial photographs and other published datasets. Rincon then conducted a field reconnaissance survey from publicly accessible roads and public lands to evaluate if existing conditions were consistent with the general mapped boundaries, and annotated draft maps. ESHA features were then revised and mapped using Geographic Information Systems (GIS) software, and attribute information for ESHA within the Morro Bay coastal zone was compiled using a combination of field observations regarding existing conditions in the study area, and supporting evidence from a variety of publicly available datasets. The existing published datasets vary in regards to scale, methodology and purpose, and were used as a baseline to support more specifically and consistently mapped ESHA boundaries.

Accessible areas with potential ESHA and sites adjacent to ESHA, as well as rare habitats with high level of sensitivity, were selected for field verification. Field reconnaissance surveys were conducted on May 22, 23, and 24, 2017. The field reconnaissance surveys did not constitute a definitive study to confirm the presence or absence of federal or state listed rare, endangered, threatened or fully protected species (i.e. special status species), nor did the surveys include formal delineation of wetlands and other waters. Protocol surveys to determine the presence or absence of special status species were not performed as part of this analysis.

Based on the above methodology, potential ESHA polygons and stream centerlines were generated using Arc Map 10.3. (These are provided as a separate enclosure with this report.)



Plan MORRO BAY

FIGURE 1

City of Morro Bay Coastal Zone Area

Mapping criteria was generally conducted based on a minimum mapping unit of 0.10 acre and further reduced based on existing site conditions (i.e. breaks in features at existing roads, changes in vegetation structure, the City's coastal zone boundary, and distinction on recent aerial photographs) and publicly available GIS data. Stream features lacking visible riparian canopy or wetland vegetation are depicted as centerlines due to lack of access for more specific mapping that would be necessary for ordinary high water mark (OWHM) and top of bank mapping. Approximately 3,767 acres comprise the Morro Bay coastal zone and therefore, were included in this review. Once the preliminary ESHA polygons were generated, existing information previously reviewed to aide in generating the polygons, including data from the California Natural Diversity Database (CNDDB; CDFW 2017), U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) designated final critical habitat polygons (2017a; 2017), USFWS National Wetlands Inventory (NWI; 2017b), United States Geological Survey (USGS) National Hydrography Dataset (NHD; 2017), and other datasets were overlaid to integrate supporting documentation for ESHA designation into the shapefile attributes. Published maps in reports, including map products in annual eelgrass survey reports by the Morro Bay National Estuary Program (MBNEP), were also referenced.

Based on the above methodology, potential ESHA polygons and stream centerlines were generated using Arc Map 10.3. (These are provided as a separate enclosure with this report.) Mapping criteria was generally conducted based on a minimum mapping unit of 0.10 acre and further reduced based on existing site conditions (i.e. breaks in features at existing roads, changes in vegetation structure, the City's coastal zone boundary, and distinction on recent aerial photographs) and publicly available GIS data. Stream features lacking visible riparian canopy or wetland vegetation are depicted as centerlines due to lack of access for more specific mapping that would be necessary for ordinary high water mark (OWHM) and top of bank mapping. Approximately 3,767 acres comprise the Morro Bay coastal zone and therefore, were included in this review. Once the preliminary ESHA polygons were generated, existing information previously reviewed to aide in generating the polygons, including data from the California Natural Diversity Database (CNDDB; CDFW 2017), U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) designated final critical habitat polygons (2017a; 2017), USFWS National Wetlands Inventory (NWI; 2017b), United States Geological Survey (USGS) National Hydrography Dataset (NHD; 2017), and other datasets were overlaid to integrate supporting documentation for ESHA designation into the shapefile attributes. Published maps in reports, including map products in annual eelgrass survey reports by the Morro Bay National Estuary Program (MBNEP), were also referenced.

The biological productivity of the near-shore portion of the ocean is dependent on upstream activities that effect habitat and water quality. In accordance with the Commission's guidance, Marine Resources as defined in Section 30230 can be considered ESHA. Offshore resources are not included in this dataset of mapped potential ESHA; however, they are awarded the same protection by the Commission, and the condition of the contributing watershed is directly and indirectly linked to water quality and habitat conditions in receiving offshore waters. Thus, offshore marine resources were considered in reviewing potential ESHA.

2.2 SOURCE INFORMATION

The desktop review included existing environmental literature and other pertinent information, including but not limited to:

- A Manual of California Vegetation, Second Edition (Sawyer et al. 2009)
- Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986)
- CNDDB (CDFW 2017a)
- Online Biological Spatial Data Server (BIOS; CDFW 2017b)
- Calflora "What Grows Here" Online Botanical Database (2017)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (2017)
- USFWS NWI Wetlands Mapper (2017a)
- USFWS Critical Habitat Portal (and relevant published shapefiles) (2017b)
- NMFS Critical Habitat on the West Coast (and relevant published shapefiles) (2017a)
- NMFS Essential Fish Habitat Mapper (2017b)
- CDFW BIOS Habitat Connectivity Mapper (and associated shapefiles) (2017b)
- City of Morro Bay General Plan/LCP (1988; 1982, as amended)
- Atlas of Sensitive Species of Morro Bay Area (Sims 2010)
- Morro Bay Eelgrass Reports (MBNEP 2013)

Detailed information on methodology used to derive the source information is available in the source information reports, plans or at the websites listed in Section 6, References of this report. Below is a brief summary of the methodology used to generate shapefiles and other map datasets supporting the sources reviewed to support this mapping effort. Refer to Section 3 for results of database and literature reviews, as well as maps depicting the locations of resources presented by these source data sets. As noted in the following detailed discussion, map scales and methodology among these data sources varied and level of accuracy is not consistent across all datasets.

2.2.1 USFWS National Wetlands Inventory

The USFWS objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. This dataset represents the extent, approximate location and type of wetlands and deepwater habitats in the United States and its Territories. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979). The maps are prepared on a national scale, from the analysis of high altitude imagery, and contain a level of error on a local scale. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis. The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground-truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

This dataset should be used in conjunction with the Wetlands Project Metadata layer, which contains project-specific wetlands mapping procedures and information on dates, scales and emulsion of imagery used to map the wetlands within specific project boundaries. The present goal of the USFWS is to provide the citizens of the United States and its Territories with current geospatially referenced information on the status, extent, characteristics and functions of wetlands, riparian, deepwater and related aquatic habitats in priority areas to promote the understanding and conservation of these resources.

This dataset was used as a reference to support more refined mapping based on aerial photo interpretation and features observable from public rights of way and publicly accessible sites.

Exclusions - Certain wetland habitats are excluded from the NWI mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

By policy, the USFWS also excludes certain types of "farmed wetlands" as may be defined by the Food Security Act or that do not coincide with the Cowardin et al. (1979) definition. Contact the USFWS Regional Wetland Coordinator for additional information on what types of farmed wetlands are included on wetland maps.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

2.2.2 National Hydrography Dataset

The National Hydrography Dataset (NHD), a component of the USGS National Map, is a digital geospatial dataset that defines the general location of surface waters in the United States. The NHD provides mapping of the nation's drainage networks, including rivers, streams, drainages, lakes, ponds, coastlines, dams, and canals, with a resolution of 1:24,000 scale or better. These datasets are updated quarterly and used in general mapping of surface water systems (USGS 2017).

2.2.3 Critical Habitats

Critical habitat is a term used in the federal Endangered Species Act (ESA) and defined as a specific geographic area (or areas) that contain features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. These areas provide notice to the public and land managers of the importance of these areas to the conservation of a listed species. Special protections and/or restrictions are possible in these areas when Federal funding, permits, licenses, authorizations, or actions occur or are required.

When a species is proposed for listing as endangered or threatened under the ESA, the USFWS or NMFS, depending on the species, must consider whether there are areas of habitat believed to be essential to the species' conservation. An area is designated as "critical habitat" after the USFWS or NMFS publishes a proposed rule in the Federal Register and receives and considers public comments on the proposal. The final boundaries of the critical habitat are also published in the Federal Register. Critical habitat is mapped on varying scales and may include areas that are not currently occupied by the species but that will be needed for its recovery. The final boundaries of the critical habitat area, once identified, are published in the Federal Register and accessible to the public. Due to varying scales of mapping efforts and lack of on the ground access, a margin of error is inherent; thus, detailed on-the-ground inspection of any particular site may provide more information regarding a specific site's suitability to support a particular listed species.

The USFWS is responsible for designation of critical habitat for terrestrial species, freshwater aquatic species, and certain fur-bearing ocean mammals, including sea otters. The NMFS of the National Oceanic and Atmospheric Association (NOAA) is responsible for establishing critical habitat for protection of sensitive marine species such as such as whales, sea turtles, corals, and anadromous species including steelhead and salmon. They aim to provide vital services, including the conservation of protected resources and healthy ecosystems.

2.2.4 Marine Mammal Protection Act and Magnuson-Stevens Fishery Conservation and Management Act

The NMFS also administers the Marine Mammal protection Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Under the Marine Mammal Protection Act and the ESA, the NMFS works to recover and protect sensitive marine (and anadromous) wildlife. Under the Magnuson-Stevens Act, the NMFS requires regional fishery management councils to identify the Essential Fish Habitat (EFH) which is identified in a fisheries management plan. EFH is broadly defined as those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. The open ocean including and north of Morro Rock as well as Morro Bay is considered EFH pursuant to the EFH Mapper (NMFS, 2017). EFH in these areas includes but is not limited to groundfish, such as sole, flounder and sanddab, which is currently or has historically been occupied by such species (Pacific Fishery Management Council, 2016).

2.2.5 Habitat Connectivity Maps

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

The California Essential Habitat Connectivity Project: A Strategy for Conserving Connected California (Spencer et al. 2010) and Penrod et al. (2010) have evaluated critical wildlife movement corridors throughout California that have been identified as priority areas for conservation. Essential Connectivity Areas (ECAs) represent the most critical wildlife movement areas for long-term conservation of California's sensitive wildlife species; however, it should be noted that ECAs do not represent an exhaustive list of movement corridors in the state and they are presented on a City or County scale. ECAs are large, continuous areas, and individual ECAs may overlap one another without clearly defined boundaries.

2.2.6 CDFW California Natural Diversity Database

The CNDDB aims to provide the most current information and to track the location and condition of all reported occurrences of California's special status species, which include those species that are listed as rare, threatened, or endangered by the CDFW or the USFWS, or are candidates for state and/or federal listing by the CDFW and/or USFWS, or have been designated as "fully protected" or "species of special concern" by the CDFW. The CNDDB also includes information on other species that are tracked by CDFW, that do not fall into any of the categories cited above. The CNDDB also includes a database and spatial dataset of the status and locations of known occurrences of California's rare species and natural community types.

The CNDDB is a dynamic system with information continually being added and upgraded. The CNDDB contains over 84,000 locational records for over 2,500 elements (plant taxa, animal taxa, and natural communities). A location record is referred to as Element Occurrence, and is a site that contains an individual, population, nest site, den, or stand of a special status element. Populations, individuals, or colonies located within 1/4 mile of each other generally constitute a single occurrence, sometimes with multiple parts.

The documentation of these occurrences serves as a guideline and background for designating suitable habitat for special status species. The CNDDB provides the date and meter accuracy of each occurrence to allow further analysis and application of the documented information. Quality of occurrence mapping varies from occurrence to occurrence, based upon the source data submitted.

2.2.7 Morro Bay General Plan/LCP

The California Coastal Act of 1976 requires each coastal jurisdiction in California to prepare and update a LCP to govern future development along the coast. The LCP includes concerns such as land use, archaeology, agriculture, and visual resources, among others. The Morro Bay LCP Land Use Plan was certified in 1982. Subsequent amendments were submitted to update the LCP following the initial certification. A comprehensive plan update was initiated in 2000 but was never certified by the Commission. The Morro Bay General Plan was adopted in 1988 and outlined physical development of the City. Land use, circulation, housing, conservation, open space, noise, and safety were all outlined in the plan.

Chapter Twelve (XII) of the Morro Bay LCP addresses ESHAs within the coastal zone of the City. The ESHAs specified in this document are discussed further in Section 3.1. Mapping produced as part of the planning efforts completed in the 1980s are also discussed in Section 3.1. An updated, complete GIS-based map of ESHAs in Morro Bay was not produced.

Additionally, a baseline report describing habitats in Morro Bay was prepared as part of the current General Plan/LCP Update. See Chapter 9 of the Baseline Assessment Chapters submitted for the Morro Bay General Plan Update for details.

2.2.8 Atlas of Sensitive Species of Morro Bay Area

The MBNEP hosts a number of publications on their website related to biological resources in the Morro Bay area. These include a 2010 Atlas of Sensitive Species of Morro Bay Area (Sims 2010), the purpose of which was to compile all available information on natural resources found in the Morro Bay area and assist in prioritizing conservation of sensitive species. This document consisted of research and analysis of references including CNDDB, peer-reviewed technical flora and fauna guides and texts, available herbaria, online databases, CDFW records and other public information. Field work was also done to confirm the presence or absence of many specials status species in the area. The project included areas around the Morro Bay Estuary and Morro Bay watershed, including the City of Morro Bay, and the town of Los Osos and Baywood Park.

2.2.9 Morro Bay Eelgrass Report

The MBNEP monitors eelgrass (*Zostera marina*) and other intertidal vegetation on an annual or biennial frequency via multispectral aerial imagery and digital classification (MBNEP 2013). The MBNEP publishes periodic reports on the status of eelgrass, including comparisons of mapping and transect studies done dating back to 2007. The most recent report published is from 2013.

2.3 MAPPING

Polygons, centerlines, and attribute information for ESHAs within the Morro Bay coastal zone were compiled using the above summarized publicly available datasets in addition to an independent reconnaissance-level field survey and intensive desktop analysis by Rincon (May 2017) based on previously listed criteria outlined in Section 1, with reference to previously listed published datasets.

3. RESULTS

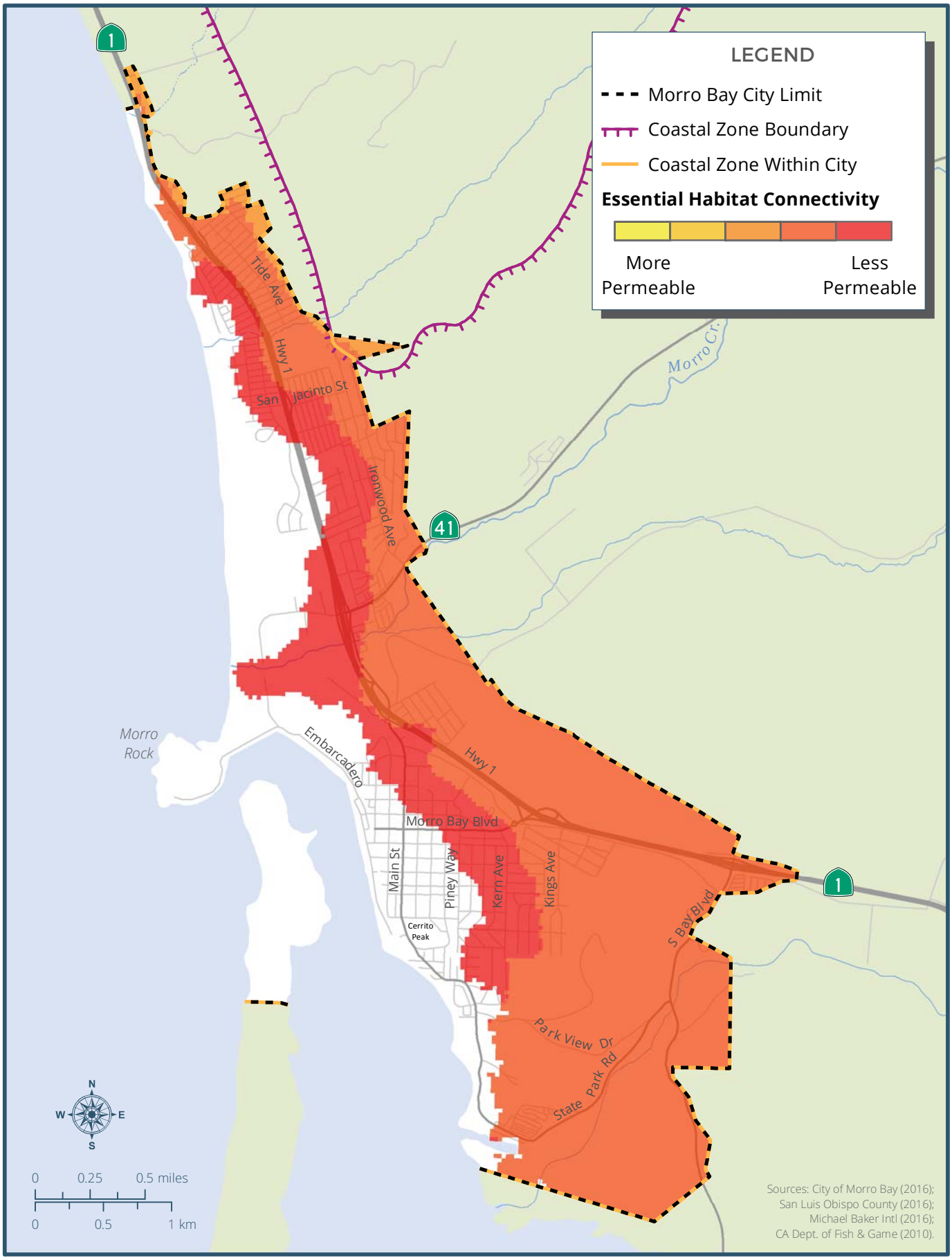
A geographic area can be designated ESHA due to the presence of individual species of plants or animals, or the presence of a particular habitat. Second, for an area to be designated as ESHA, the species or habitat must be either rare, or especially valuable, or determined to be easily disturbed or degraded by human activities. In this section, we first present results of the database queries, literature reviews, and field surveys that support ESHA determination, and then synthesize the information into updated ESHA categories and mapping. Updated current ESHA extent is presented on updated maps as well as updated spatial datasets in shapefile format. Attribute information within the spatial dataset includes vegetation communities and other habitats, occurrences of special status species supported by these habitats, critical habitat locations, and known or potential wetlands and waters. ESHA as depicted within the GIS submittal can serve as an illustrative tool to help identify potential biological resources.

ESHA information provided in this submittal is not intended to be an exhaustive compilation of the habitat areas that meet the ESHA definition; therefore, requirements for conducting site-specific biological evaluations and field observations to identify ESHA and other sensitive biological resources are required prior to project development approval. Following completion of the mapping of ESHAs, ESHAs will be buffered by an agreed upon buffer, typically a minimum of 50-100 feet. While exact policy is still being developed, typically, LCPs require that sites with mapped ESHA areas or areas that fall within the specified buffer of potential ESHA require site-specific biological evaluations and field observations to identify ESHA and other sensitive biological resources prior to project development approval.

Below is a summary of database and literature review findings, followed by a description of the updated ESHA determinations.

3.1 QUERY AND LITERATURE REVIEW RESULTS

As noted previously, Rincon evaluated and overlaid mapped wetland and vegetation information on the recent aerial imagery available from a variety of sources, including the County of San Luis Obispo. Maps depicting the locations of resources presented by these source data sets are included as Figures 2 through 6.



Plan MORRO BAY

FIGURE 2

Essential Habitat Connectivity

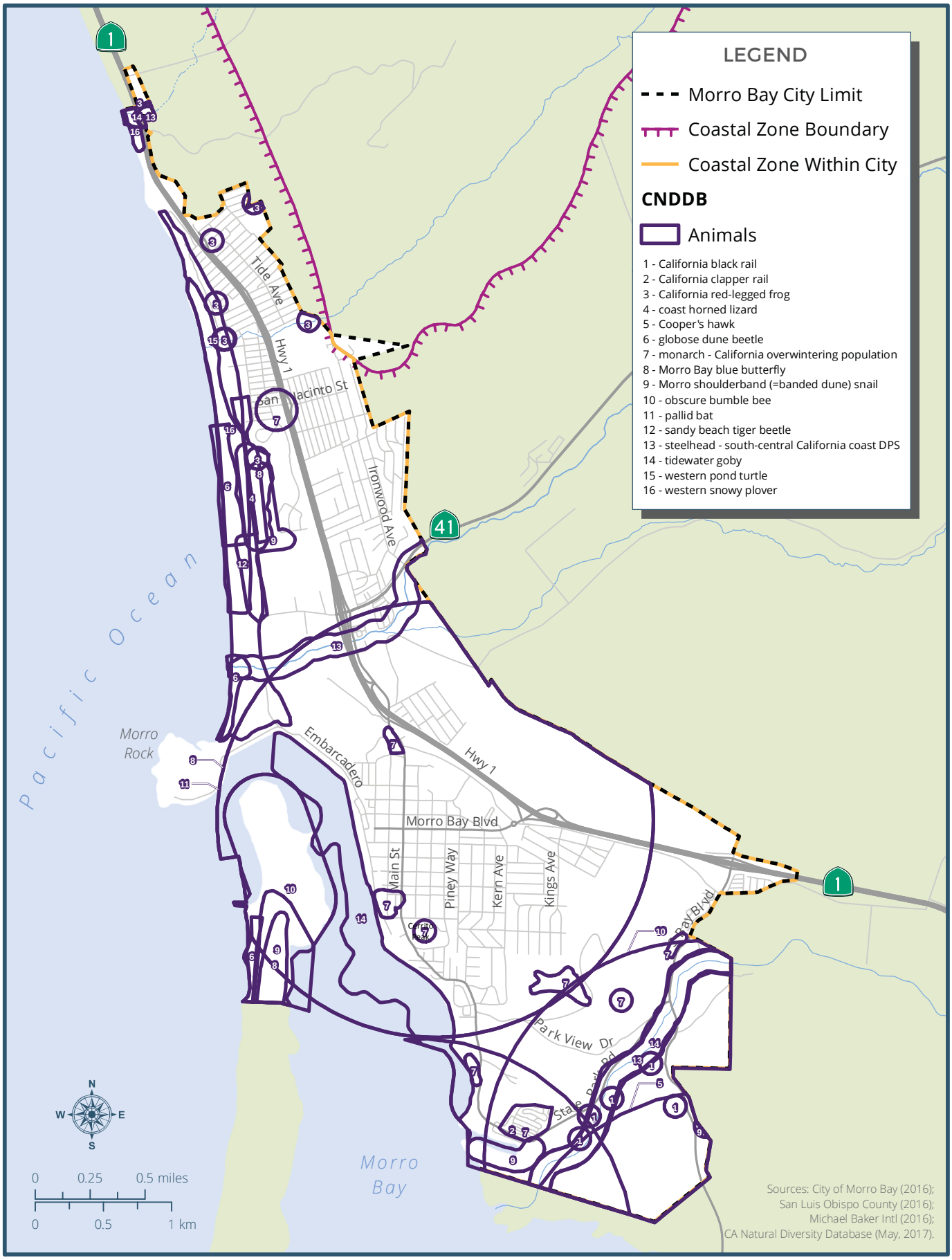
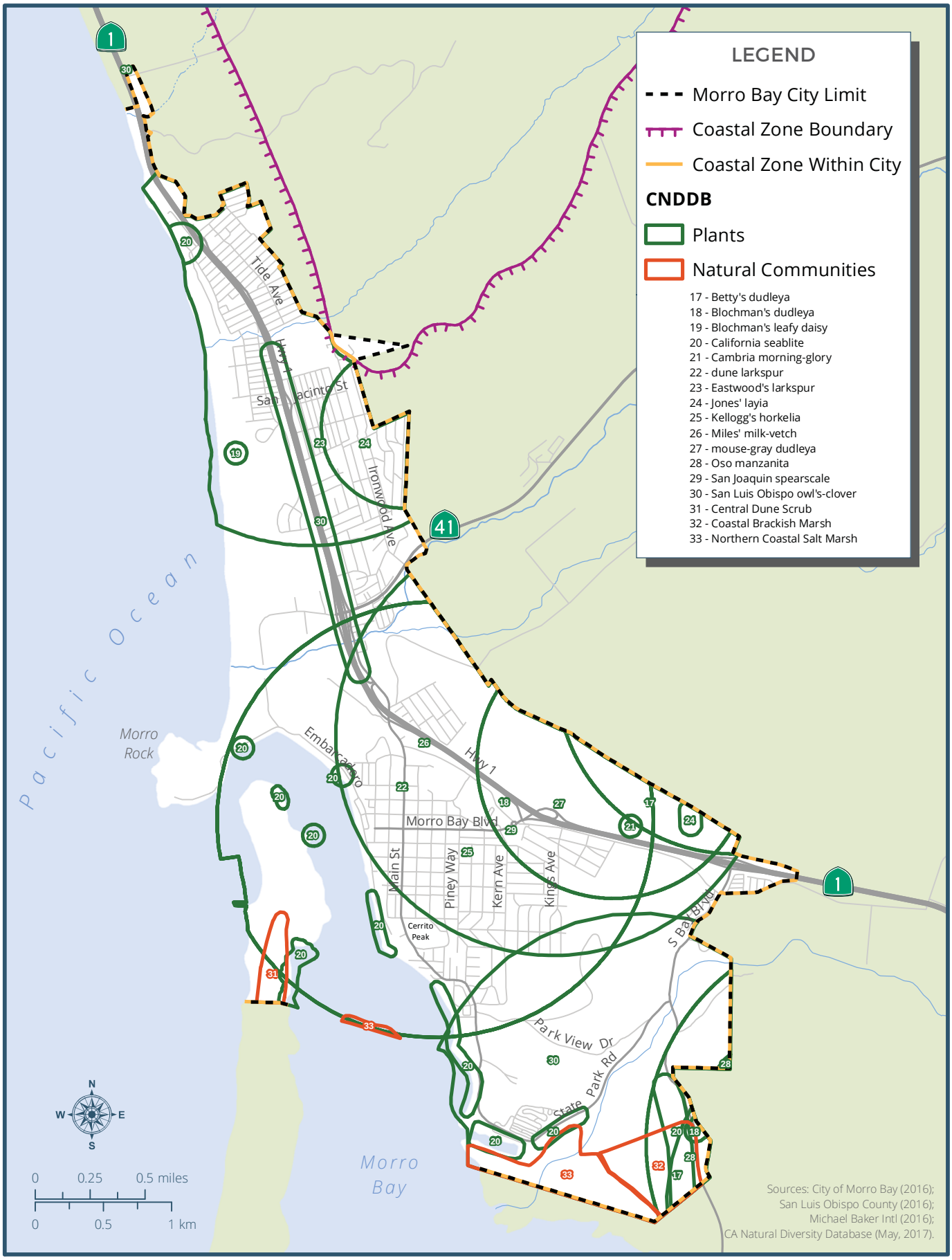


FIGURE 3A

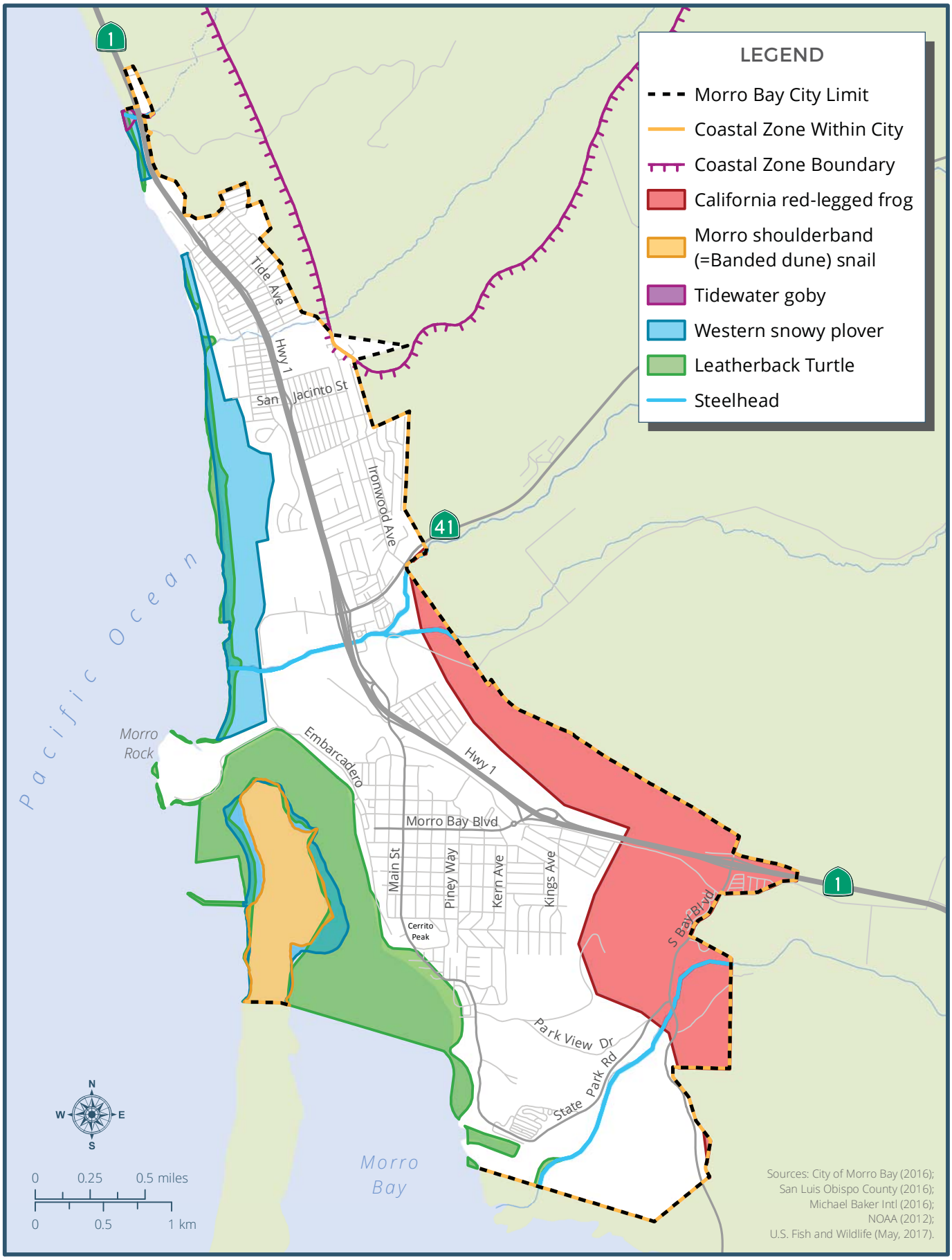
Special Status Species and Sensitive Natural Communities, as Reported by CNDDB



Plan MORRO BAY

FIGURE 3B

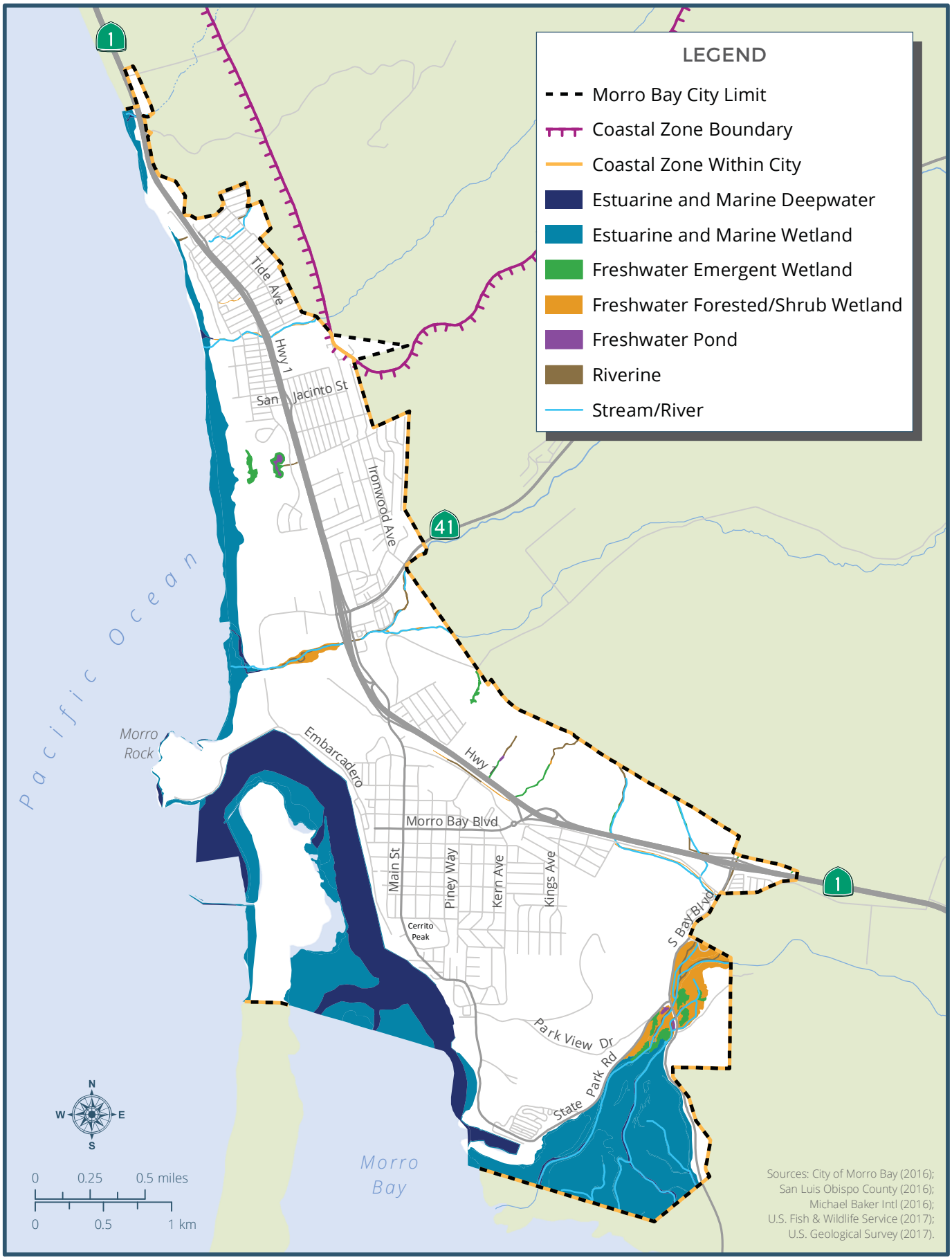
Special Status Species and Sensitive Natural Communities, as Reported by CNDDB



Plan MORRO BAY

FIGURE 4

Designated Critical Habitats



Plan MORRO BAY

FIGURE 5

Aquatic Resources as reported by NWI and NHD

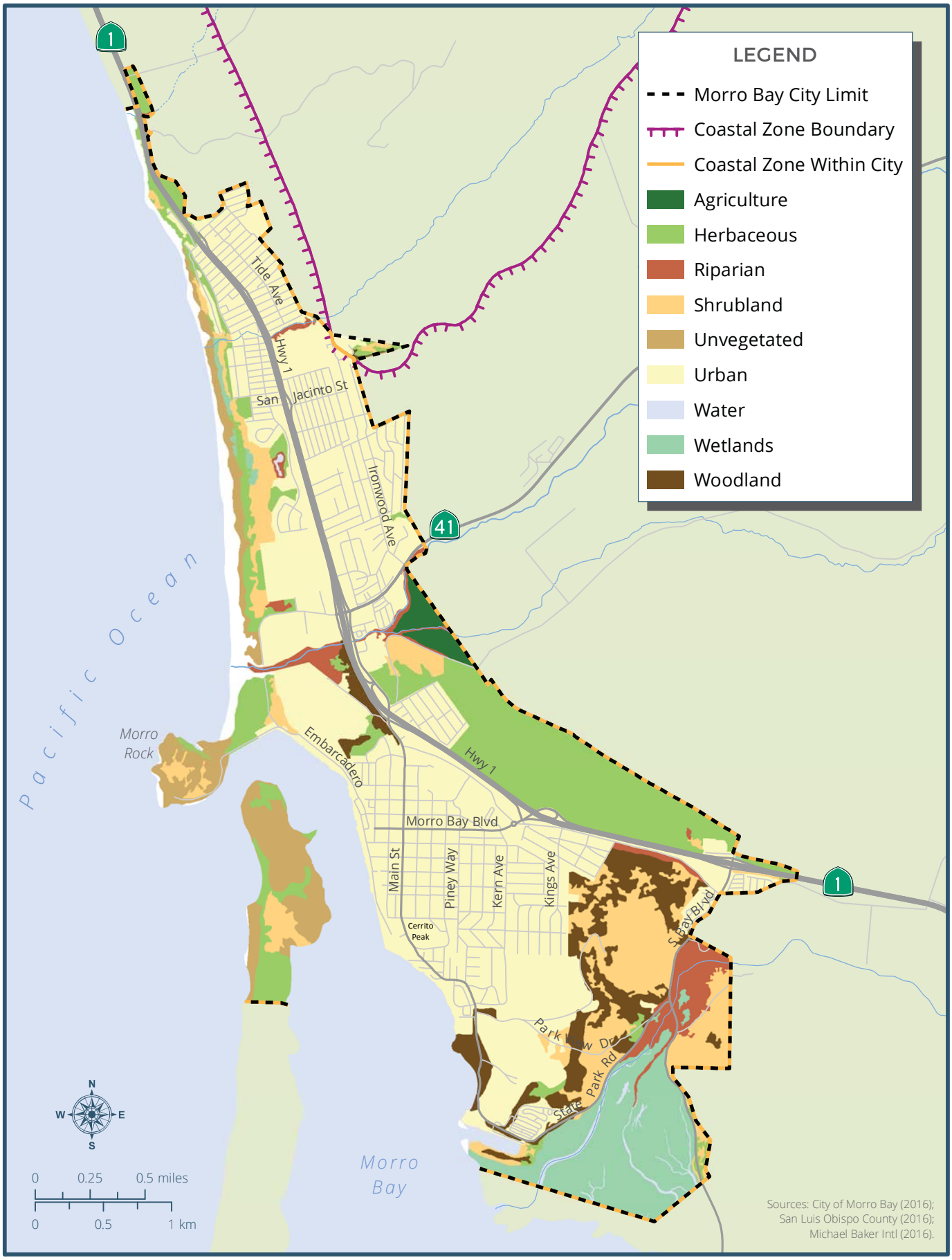


FIGURE 6

Terrestrial and Shallow-Water Habitats

3.1.1 NWI and NHD

NWI documents four wetland community types within the City's coastal zone: freshwater emergent wetland, freshwater forested/shrub wetland, estuarine and marine wetland, and estuarine and marine deepwater wetland. Additionally, riverine types are identified. The NHD identifies coastal streams, including both perennial and seasonal features, as well as the bay and estuary, and the Pacific Ocean (Figure 5).

3.1.2 Designated Critical Habitats

Final designated critical habitat for the following species occurs within the City's coastal zone: steelhead (*Oncorhynchus mykiss*), California red-legged frog (*Rana draytonii*), Morro shoulderband snail (*Helminthoglypta walkeriana*), tidewater goby (*Eucyclogobius newberryi)*, Pacific leatherback sea turtle (*Dermochelys coriacea*), and western snowy plover (*Charadrius alexandrinus nivosus*) (Figure 4). Records for steelhead, California red-legged frog, Morro shoulderband snail, tidewater goby, and western snowy plover are reported from the Morro Bay coastal zone. Suitable habitat for federally listed species within federally designated critical habitat is expected to be ESHA, even if the species has not been previously documented as occurring in particular locations.

It should be noted that critical habitat for Pacific leatherback sea turtle along the Pacific coast, including the vicinity of Morro Bay, was designated on the basis of prey base. Pacific leatherback are specialists that consume jellyfish, including brown sea nettle (*Chrysaora fuscescens*) and other scyphomedusae of the order Semaeostomeae, such as moon jellies (*Aurelia labiata*) (NFMS 2012a, 2012b). Two populations of Pacific leatherback are recognized: the Western population breeds on tropical islands in the western Pacific islands, including Indonesia, Papau New Guinea, and the Solomon Islands, and migrates extreme distances between breeding and foraging grounds, which include coastal waters along the west coast of North America; the Eastern population breeds on tropical beaches in Mexico and Central America, and forages primarily in tropical waters of the eastern Pacific Ocean (NMFS 2012b). Pacific leatherbacks are not known or expected to breed on beaches in Morro Bay. Additionally Pacific leatherbacks do not typically pursue prey farther than the mean lower low water and thus are not expected from shallow water habitats of the immediate shore of the Morro Bay coastal zone (including the intertidal zone). Pacific leatherback could occur in the marine environment offshore, in deeper waters adjacent to areas evaluated for ESHA, as they have been reported foraging in the deeper coastal waters of Estero Bay marine environment, based on telemetry data, fishery interaction data, and aerial surveys (NFMS 2012b).

3.1.3 Habitat Connectivity

Wildlife movement corridors can be both large and small scale. Regionally, the Morro Bay coastal zone is located at the edge of an identified ECA, as mapped in the report, California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California (2010). This ECA that connects Natural Landscape Blocks such the Los Padres National Forest

and other relatively intact natural areas. This essential habitat connectivity is mapped as somewhat permeable along the eastern edges of the Morro Bay coastal zone, and less permeable in developed areas (Figure 2). The immediate coast and coastal strand were not mapped as part of this ECA in the available larger scale habitat connectivity models. ECAs are mapped based on coarse ecological condition indicators, rather than the needs of particular species and thus serve the majority of species in each region.

Small scale habitat corridors are also present in the Morro Bay coastal zone, and include drainages and other topographic features that facilitate movement, and contiguous areas of natural vegetation, including the coastal dunes and Black Hill Natural Area. Perennial streams, wetlands, shallow bays and estuaries, including Morro Creek and Morro Bay Estuary, provide potential fish and other aquatic wildlife movement habitat. At the local scale, areas of natural vegetation, including drainages, provide important movement opportunities for wildlife, particularly where these features connect blocks of natural vegetation interspersed with developed areas, and therefore, have been utilized for guidance regarding ESHA, although habitat connectivity alone does not constitute an ESHA determination.

3.1.4 Special Status Species

It has been established that the Commission will consider presence of a rare plant and/or wildlife species (when there is other compelling evidence of rarity such as consideration for listing as rare, threatened or endangered under the California or federal Endangered Species Acts and/or evidence of rarity in published academic studies) to signify an area as ESHA. For the purposes of this analysis, "Special Status Species" includes the following:

- Species listed as threatened or endangered under the federal ESA;
- Species listed as rare, threatened, or endangered under the California ESA;
- Species considered "Fully Protected" or "Species of Special Concern" by the CDFW that were documented as occurring in the Morro Bay General Plan/LCP (1982); and
- Plants ranked California Rare Plant Rank (CRPR) 1 or 2 in the CNDDB and/or CNPS Online Inventory of Rare and Endangered Plants. Some CRPR 3 and 4 species are also considered when they are part of an unusual plant community, on an unusual substrate, at type localities, and when locally designated as species of concern.

Seventeen special status wildlife species, sixteen special status plant species, and three special status vegetation communities are documented in the CNDDB as occurring within the City's coastal zone as shown on Figure 3. See Appendix B for a complete list of Sensitive Species, Natural Communities, and Designated Critical Habitats reported to occur in the vicinity, as reported by the CNDDB.

Of these, listed species documented within the City's coastal zone include salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), California seablite (*Suaeda californica*), Morro shoulderband snail, tidewater goby, and western snowy plover. Morro Creek and Chorro Creek are designated critical habitat for south-central California coast steelhead.

Open space areas within the City's coastal zone with documented occurrences of listed or rare species or special status habitats are considered potential ESHA. While individual occurrences of the above mentioned species may not indicate the presence of ESHA, their presence could indicate the overall high quality and value of the habitat in which the species is observed.

3.1.5 Previously Described ESHA

The City of Morro Bay first adopted an approved LCP in 1982. Habitat areas as described in the 1982 City of Morro Bay LCP (MBLCP) were grouped into four broad categories: coastal wetlands, coastal streams/riparian habitats, rare or endangered wildlife habitats, and rare or endangered plant communities. The following criteria were used to establish ESHA:

1. unique, rare or fragile communities which should be preserved to ensure their survival in the future;

2. rare and endangered species habitats that are also protected by state and federal laws;

3. specialized wildlife habitats which are vital to species survival;

4. outstanding representative natural communities which have an unusual variety or diversity of plant and animal species; and

5. areas with outstanding educational values that should be protected for scientific research and educational uses now and in the future.

These ESHAs were referenced in the text and shown at a large scale within the document. No pre-existing spatial data were available for these maps, so the map was georectified and the data were hand-digitized into ArcGIS in shapefile format. Each of the previously identified ESHA types is summarized in the following sections.

Coastal Wetlands

The original MBLCP included three habitat types generally consisting of coastal wetlands: wetland, estuary, and open coastal water. These habitat types were defined in the MBLCP as follows:

a. Wetland: lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes; swamps, mudflats and fens.

b. Estuary: coastal water body usually semi-enclosed by land, but which has open, partially obstructed or intermittent exchange with the ocean and in which ocean water is at least occasionally diluted by fresh water runoff from the land. The salinity may be periodically increased above the open ocean by evaporation. In general, the boundary between "wetland" and "estuary" is the line of extreme low water.

c. "Open coastal water" or "coastal water" refers to the open ocean.

Morro Bay and the Morro Bay Estuary comprise the primary wetland areas within the City. The bay is primarily a shallow lagoon with two freshwater creeks (Chorro and Los Osos) draining into it. Tidal waters also fill the bay, flowing through the bay entrance and southward to fill the bay. The intertidal area is saltmarsh and mudflat. Morro Bay is separated from Estero Bay, by an approximately 4-mile long sandbar which extends north/northeastward from the Irish Hills to the mouth of the bay near Morro Rock. Morro Bay is the interior, enclosed bay to the east (inland) side of the sandbar, and Estero Bay is the outer bay that forms the coast of the Pacific Ocean along the west edge of the Morro Bay coastal zone. Morro Bay is tidal and directly connected to the Pacific Ocean through a channel that is maintained through periodic dredging south of Morro Rock. A portion of Morro Bay is maintained for harbor uses. The remainder includes coastal wetlands, tidal marshes, mudflats, freshwater marshes and related bodies of water. Morro Bay and Morro Bay Estuary serve as an important link between oceanic and terrestrial ecosystems. A sensitive and delicate balance exists between the tidal flushing of the bay and the nutrient-rich freshwater runoff which retains the productivity of these systems.

Coastal Streams/Riparian Habitats

The MBLCP included two habitat types within coastal streams/riparian habitats: stream or river, and riparian habitat, and defines these habitat types as follows:

a. Stream or River: natural watercourse as designated by a solid line or dash and three dots symbol shown on the USGS map most recently published, or any well-defined channel with distinguishable bed and bank that shows evidence of having contained flowing water as indicated by scour or deposit of rock, sand, gravel, or other debris.

b. Riparian Habitat: an area of riparian vegetation consists of an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water.

Toro Creek, Alva Paul Creek, Morro Creek, Little Morro Creek, Chorro Creek, and other unnamed creeks are present in the MBLCP area. Freshwater streams serve as an important coastal resource. The Chorro and Los Osos creeks drain into Morro Bay Estuary from the upland areas of large watersheds. The combined estuary at the mouth of these two perennial creeks is a significant habitat in the bay. Unlike the Chorro and Los Osos creeks, Morro Creek is intermittent, and several other creeks within the City are ephemeral (they do not run year round).

Many of the creeks that do not drain into the estuary drain directly into Estero Bay (the Pacific Ocean).

Rare or Endangered Habitats

The original MBLCP considers both rare and endangered wildlife habitats and rare or unusual plant communities within this category and includes three distinct areas within Morro Bay within this habitat type: Morro Rock, Black Hill Natural Area, and Fairbanks Point.

Morro Rock

Morro Rock is located at the mouth of the bay and is the northern-most visible volcanic plug in a chain of plugs that extend from Islay Hill in the City of San Luis Obispo to Morro Rock. The Rock is connected to the mainland via a strand composed of fill materials, much of it dredged from the bay during past operations. The Rock is a known peregrine falcon nest site.

Black Hill Natural Area

This upland area of Morro Bay State Park is located southeast of the City. The clubhouse and golf course are located to the southwest of Black Hill. The dominant community is coastal sage scrub. Rare plants, including Jones' layia (*Layia jonesii*), are known to occur in this natural area reserve.

Fairbanks Point

Located at the southern end of the City limits and adjacent to Morro Bay State Park is Fairbanks Point. The grove of eucalyptus trees located at Fairbanks Point served as a major nesting site for herons when the previous ESHA mapping was designated. With decline of the eucalyptus grove due to salt buildup from guano, the species composition using the rookery site has shifted to cormorants. In 1971, 74 active nests of the great blue heron were counted. A count conducted in 1972 indicated 100 nests of the black-crowned night heron were located here. In 2017, this rookery was occupied by active cormorant nests.

Integration of Previously Described ESHA

Previously designated ESHA was reviewed for inclusion in the updated map set. As noted above, the previous map set did not exist in GIS-compatible format, and the level of resolution of some mapped areas was low. Updated ESHA maps considered previous documentation of resources that constitute ESHA, while updating maps to have better resolution and integration into GIS-based systems.

Note that despite updated mapping efforts, unmapped ESHA may still be present, and onsite review of potential ESHA and delineation of actual ESHA boundaries may be necessary to evaluate site-specific conditions.

3.1.6 Other Sensitive Natural Communities

In addition to tracking special status species, the CNDDB also includes some data on sensitive natural communities, although this portion of the database is not currently updated. CDFW has shifted to an updated vegetation classification system, and maintains a List of California Terrestrial Natural Communities (2010). Sensitive natural communities include

- Sensitive natural communities as documented by the CNDDB;
- Rare vegetation alliances and associations ranked State Rarity ranks S1 through S3, as listed in the CDFW List of California Terrestrial Natural Communities (2010); and
- Other unique, sensitive, or fragile habitats, including shallow bay and eelgrass beds, rookeries, monarch aggregation sites, and special status raptor nest sites.

Central Dune Scrub, Coastal Brackish Marsh, and Northern Coastal Salt Marsh are sensitive natural communities reported by the CNDDB in the area. Under the updated classification used in the 2010 CDFW List of California Terrestrial Natural Communities, additional rare vegetation alliances present or likely to be present include dune mats, silver dune lupine - mock heather dune scrub, pickleweed mats, bulrush marshes and salt marsh bulrush marshes, sand dune sedge swaths, iris-leaved rush seeps, and salt rush swales.

The MBNEP eelgrass monitoring program has documented the decline of the local eelgrass populations between 2007 and 2013, and maps where the populations previously/currently occur were referenced. These maps were used as a baseline to establish ESHA within the bay itself. Eelgrass habitat was mapped in combination with shallow bay and mudflat areas.

As previously noted, Morro Rock is a known nest site for peregrine falcons. The nest site is used year after year by the now recovered peregrine falcon.

Finally, although eucalyptus trees are not native to California and in fact are often invasive, stands of eucalyptus along the coast can provide unique habitats for wildlife in some situations. Rookery sites that are used year after year as communal nest sites are known in Morro Bay, as previously noted. Additionally, some groves provide monarch overwintering habitats used each year during late fall and winter months. Where eucalyptus stands provide this unique habitat for these wildlife species, they may be considered ESHA.

3.1.7 Vegetation Maps and Site Survey Results

Morro Bay has a wide diversity of tree (hardwood and coniferous forests, oak woodlands), shrub (chaparrals, coastal scrubs), and herbaceous (grasslands and herbaceous communities) terrestrial habitat types, as well as aquatic habitat types. The vegetation communities and wildlife habitats described as occurring in the City are based on the CDFW's California Wildlife Habitat Relationship (CWHR) classification system (CDFW 2008).

The County of San Luis Obispo also produced a general vegetation map classifying general vegetation types such as woodland, shrubland, grassland, and aquatic habitats (Figure 6). These data were reviewed as part of the ESHA update.

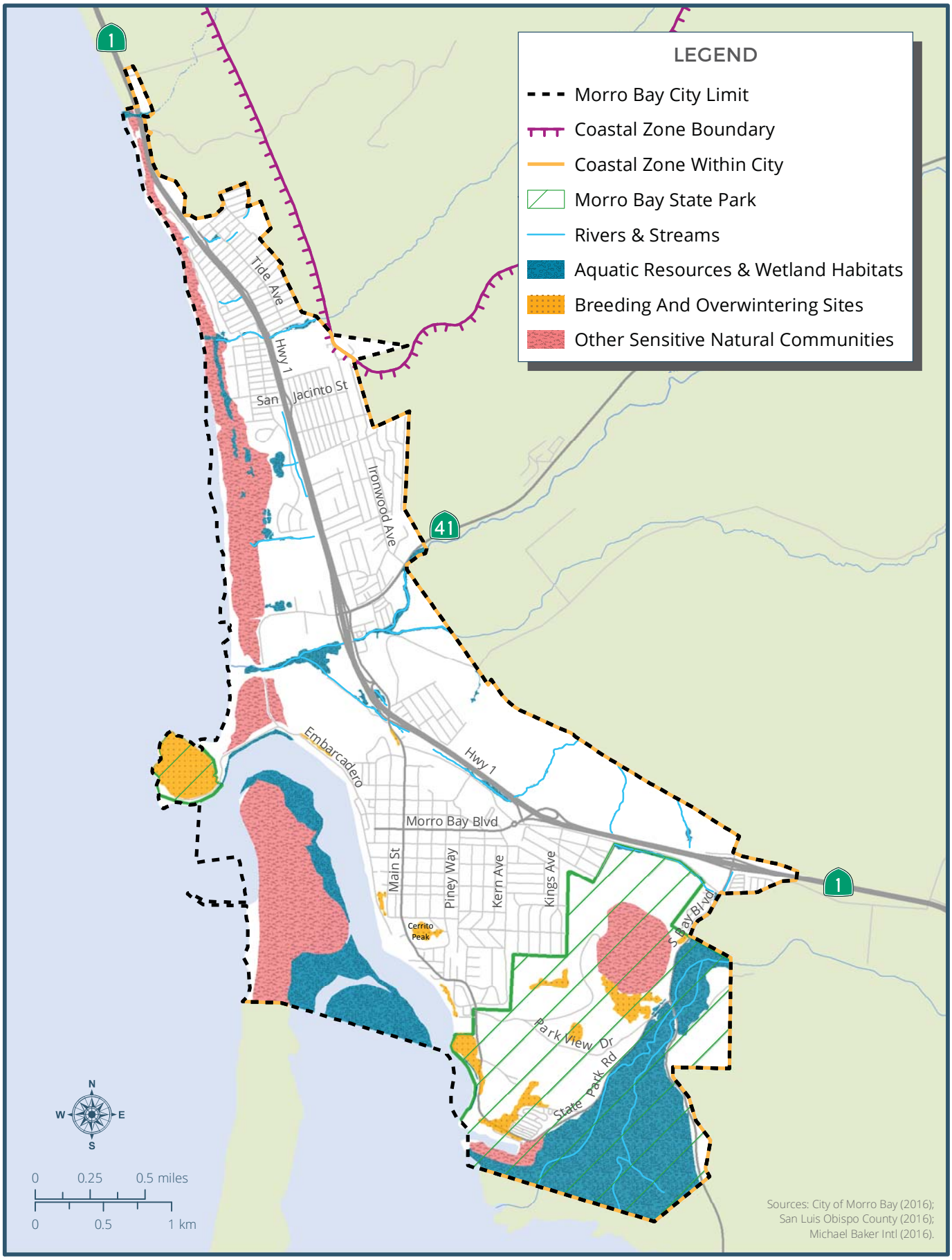
Additionally, during field surveys, vegetation communities and other habitats such as rock outcrops were evaluated to the extent feasible from public vantage points with reference to current mapping standards. In addition to urban and developed land cover types, a number of native plant communities were documented, including:

- Arroyo willow (*Salix lasiolepis*) thickets
- Dune mats
- Silver dune lupine – mock heather scrub
- Other coastal scrubs, including bluff scrub
- Pickleweed (*Salicornia* spp.) mats
- Other brackish wetlands
- Freshwater wetlands, including bulrush and rush wetlands
- Dune wetlands
- Sedge swaths

Representative photos taken during the surveys are included as Appendix A.

3.2 UPDATED ESHA DETERMINATION

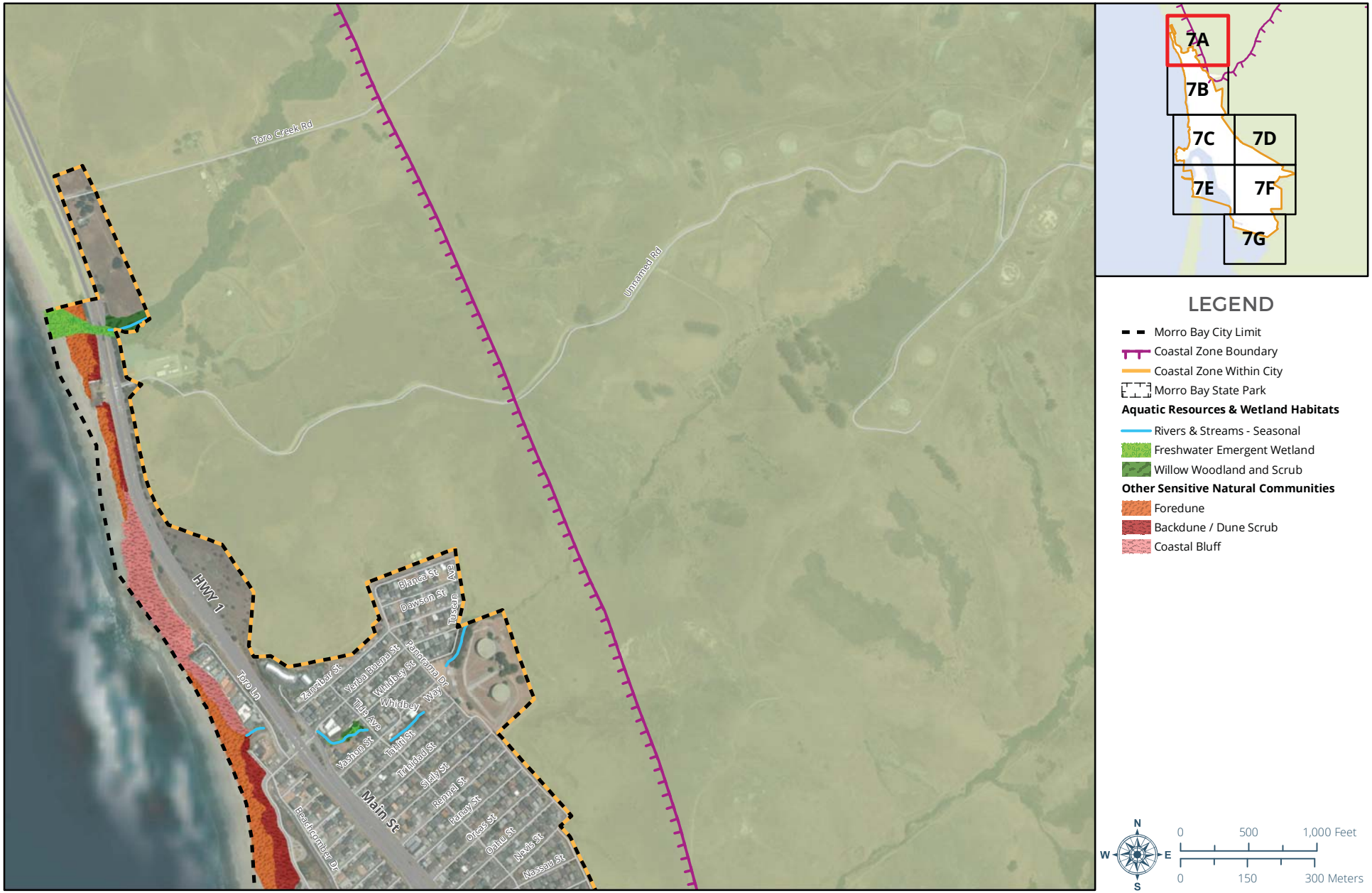
Within the City's coastal zone, approximately 1,006 acres of mapped potential ESHA were identified (please see GIS submittal package and figures), exclusive of drainages where only centerlines were mapped. To provide continuity with the 1982 plan, while including all best available data, ESHAs were grouped into three general habitat communities/categories: aquatic resources and wetland habitat; other sensitive natural communities; and breeding and overwintering sites. The mapped ESHAs are depicted in Figure 7, which includes a mapbook of finer scale maps in addition to an overview sheet. Within these broad habitat categories, more detailed community data (such as dune scrub, river/stream and monarch overwintering roosts, etc.) are included and described below, as well as provided with the attribute information. Several of the vegetation communities that occur in the City's coastal zone are designated as high priorities for conservation by CDFW, and are easily disturbed or degraded by human activity, and therefore are presumed to meet the definition of ESHA under the Coastal Act.



Plan MORRO BAY

FIGURE 7

Environmentally Sensitive Habitat Area Mapbook

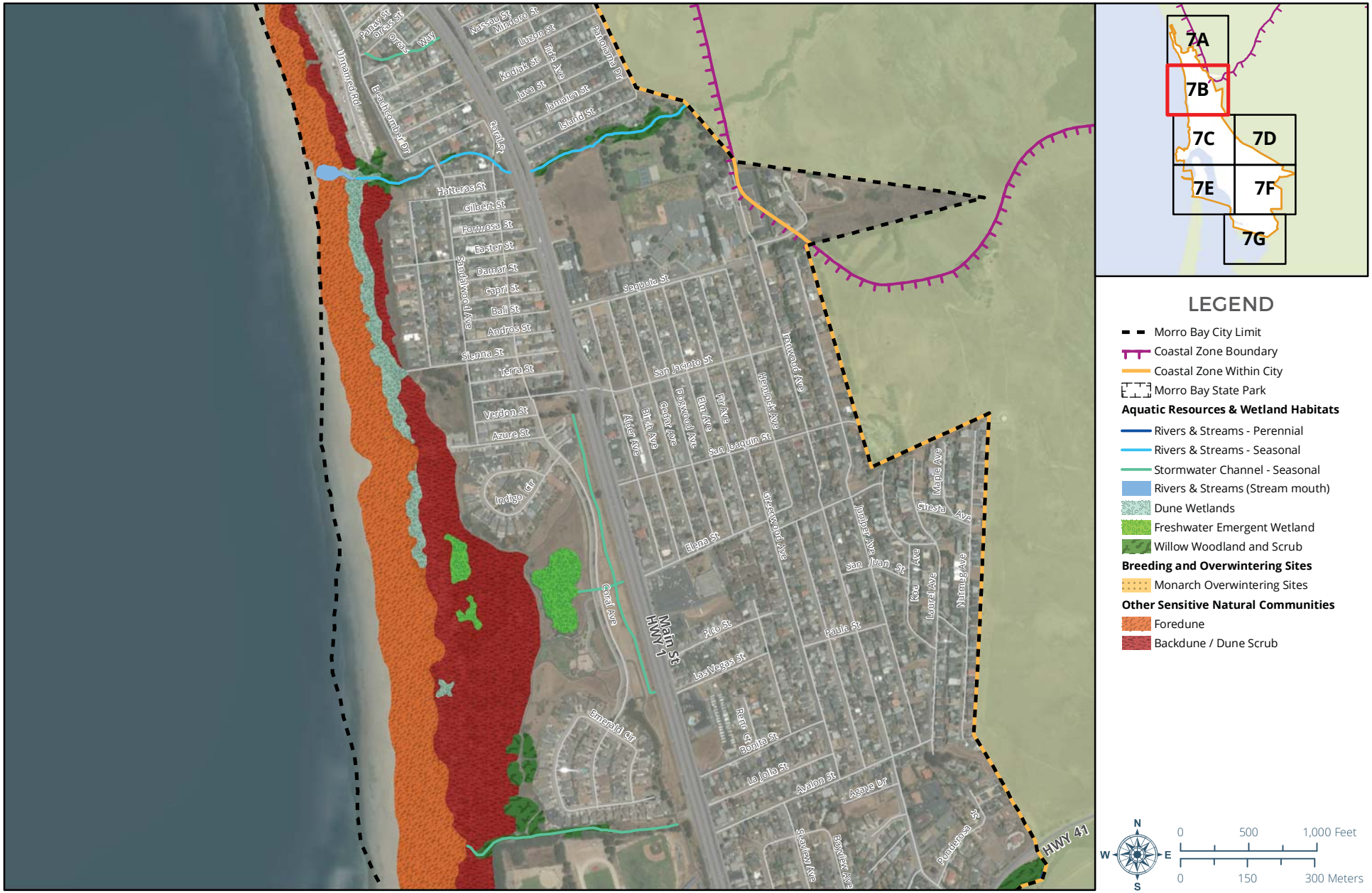


Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

FIGURE 7A

Environmentally Sensitive Habitat Area Mapbook

Plan MORRO BAY

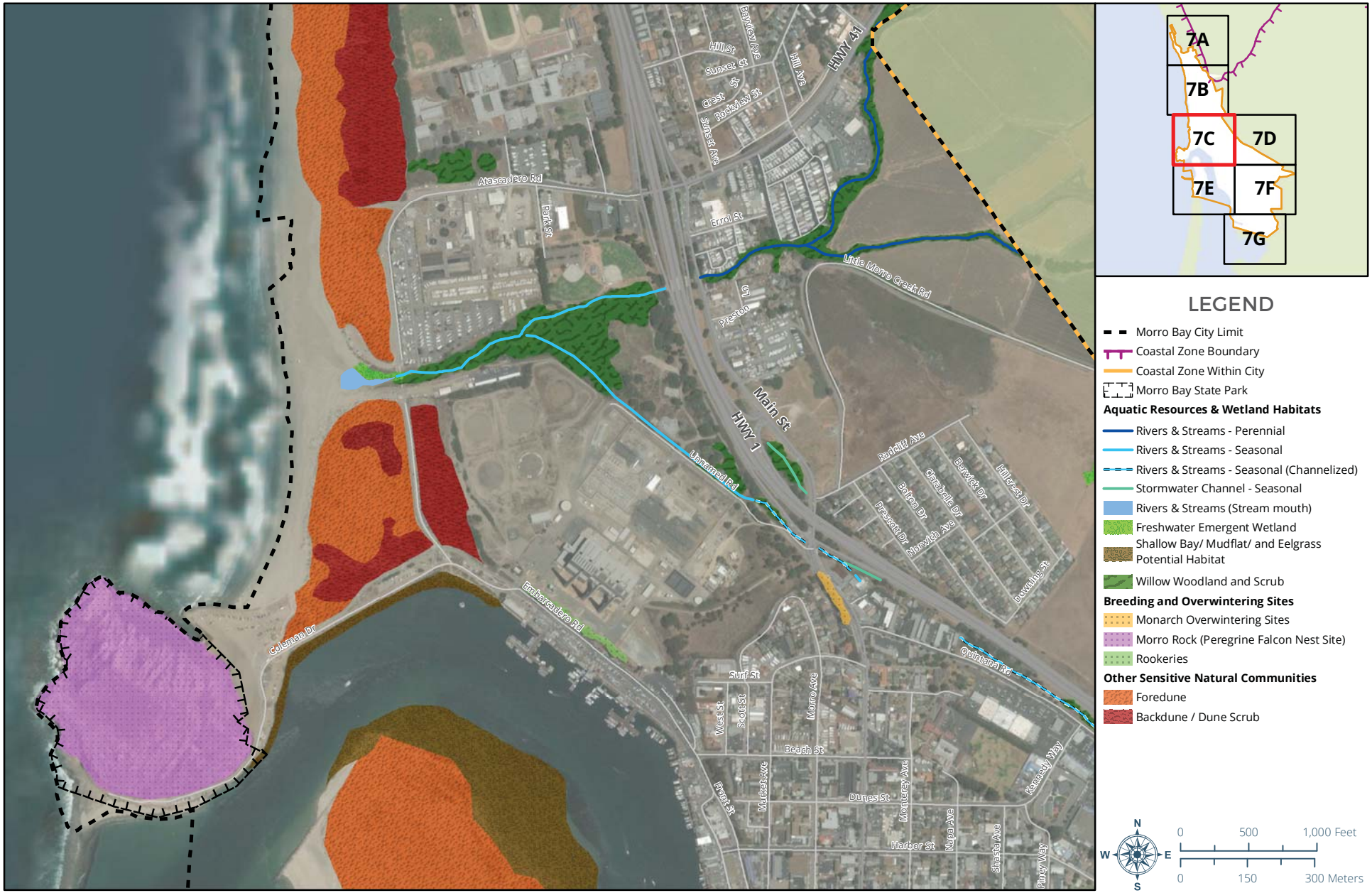


Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

FIGURE 7B

Environmentally Sensitive Habitat Area Mapbook

Plan MORRO BAY

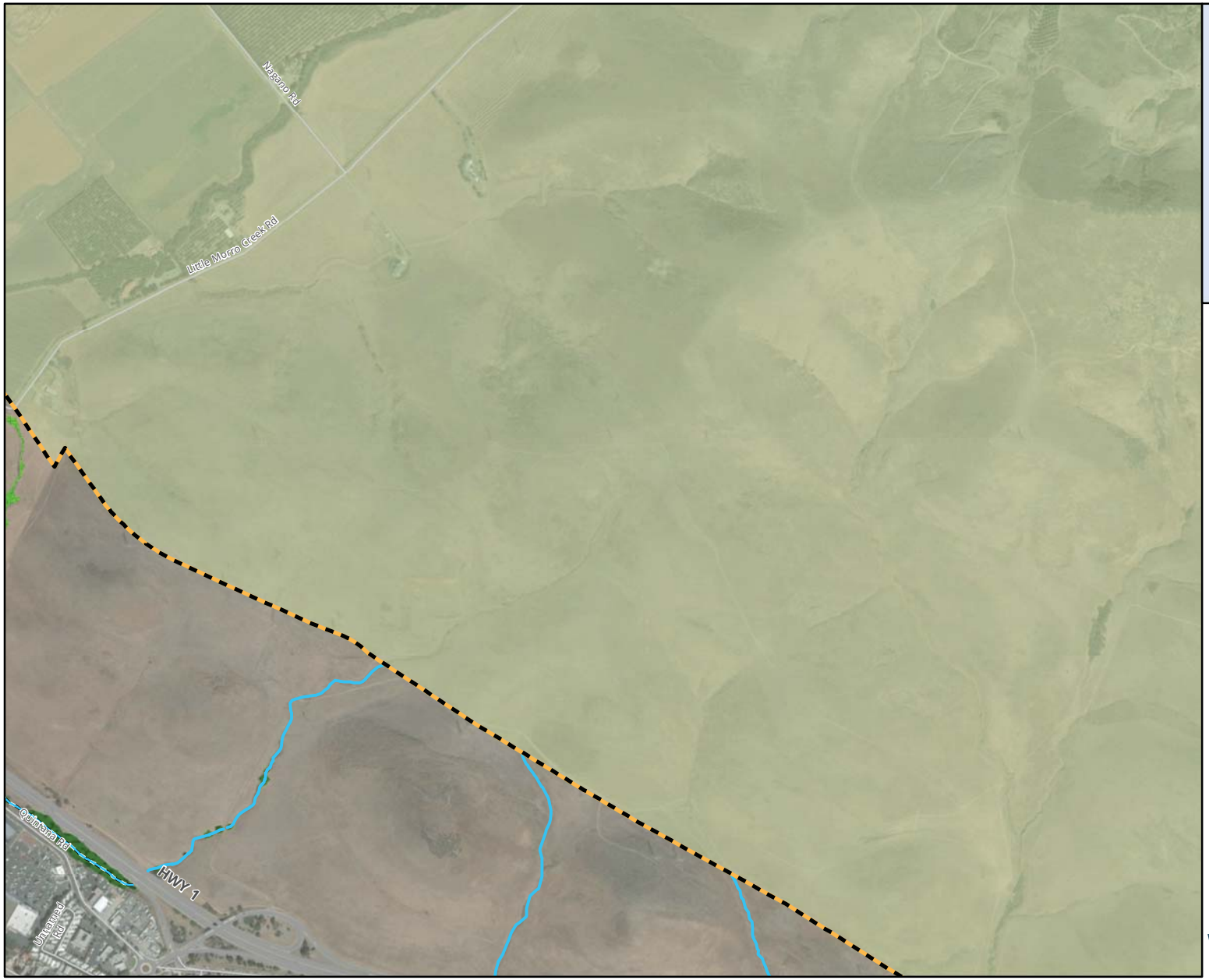


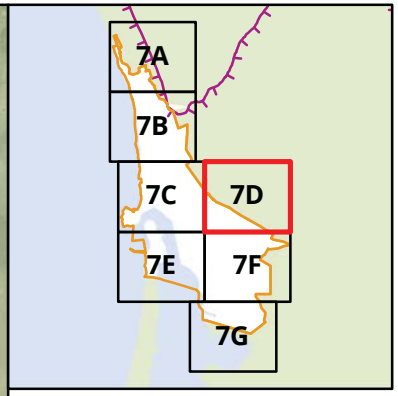
Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

FIGURE 7C

Environmentally Sensitive Habitat Area Mapbook

Plan MORRO BAY





LEGEND

- Morro Bay City Limit
- Coastal Zone Boundary
- Coastal Zone Within City
- Morro Bay State Park

Aquatic Resources & Wetland Habitats

- Rivers & Streams - Seasonal
- Rivers & Streams - Seasonal (Channelized)
- Freshwater Emergent Wetland
- Willow Woodland and Scrub

N W E S

0 500 1,000 Feet

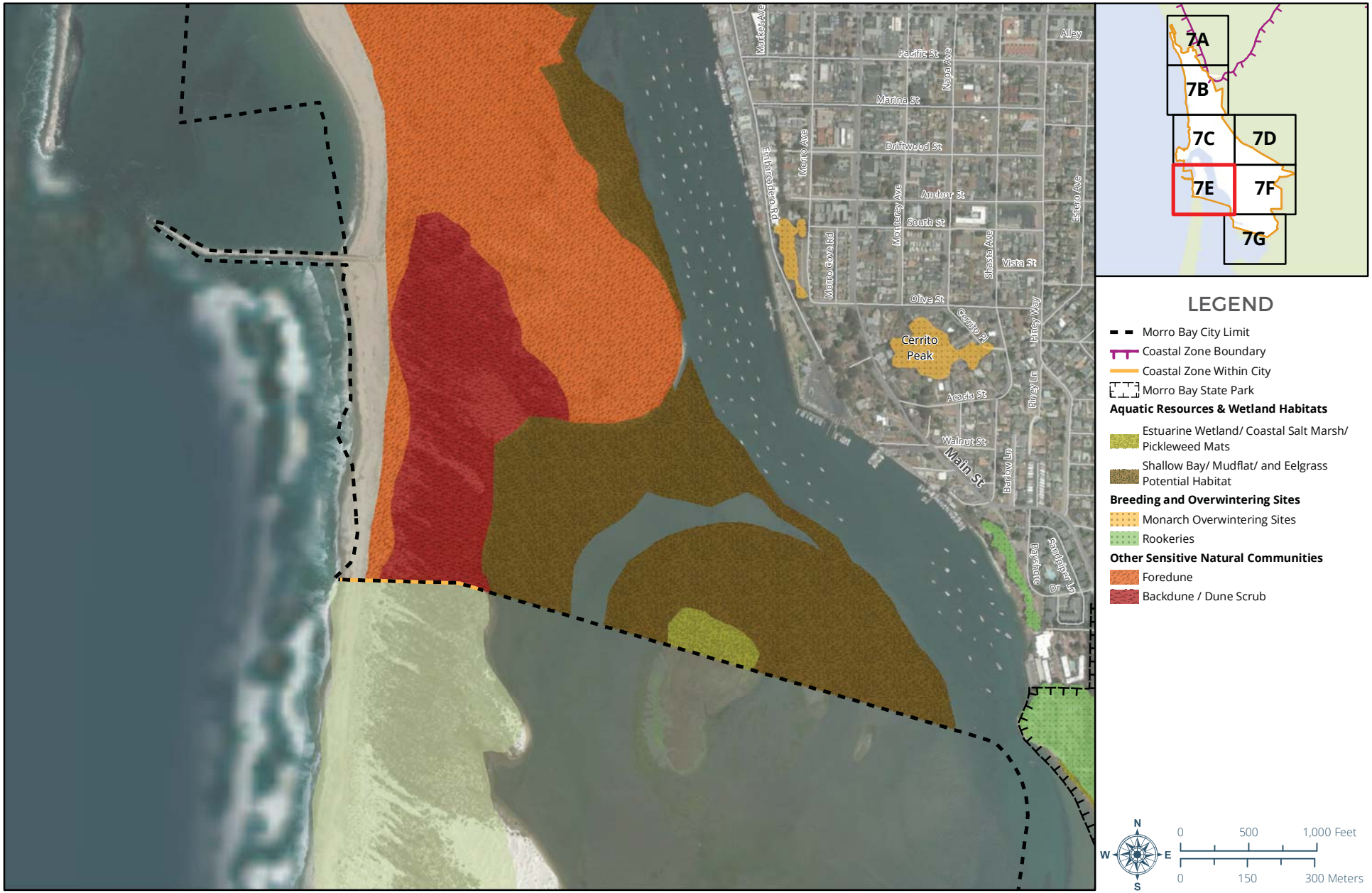
0 150 300 Meters

Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

Plan MORRO BAY

FIGURE 7D

Environmentally Sensitive Habitat Area Mapbook

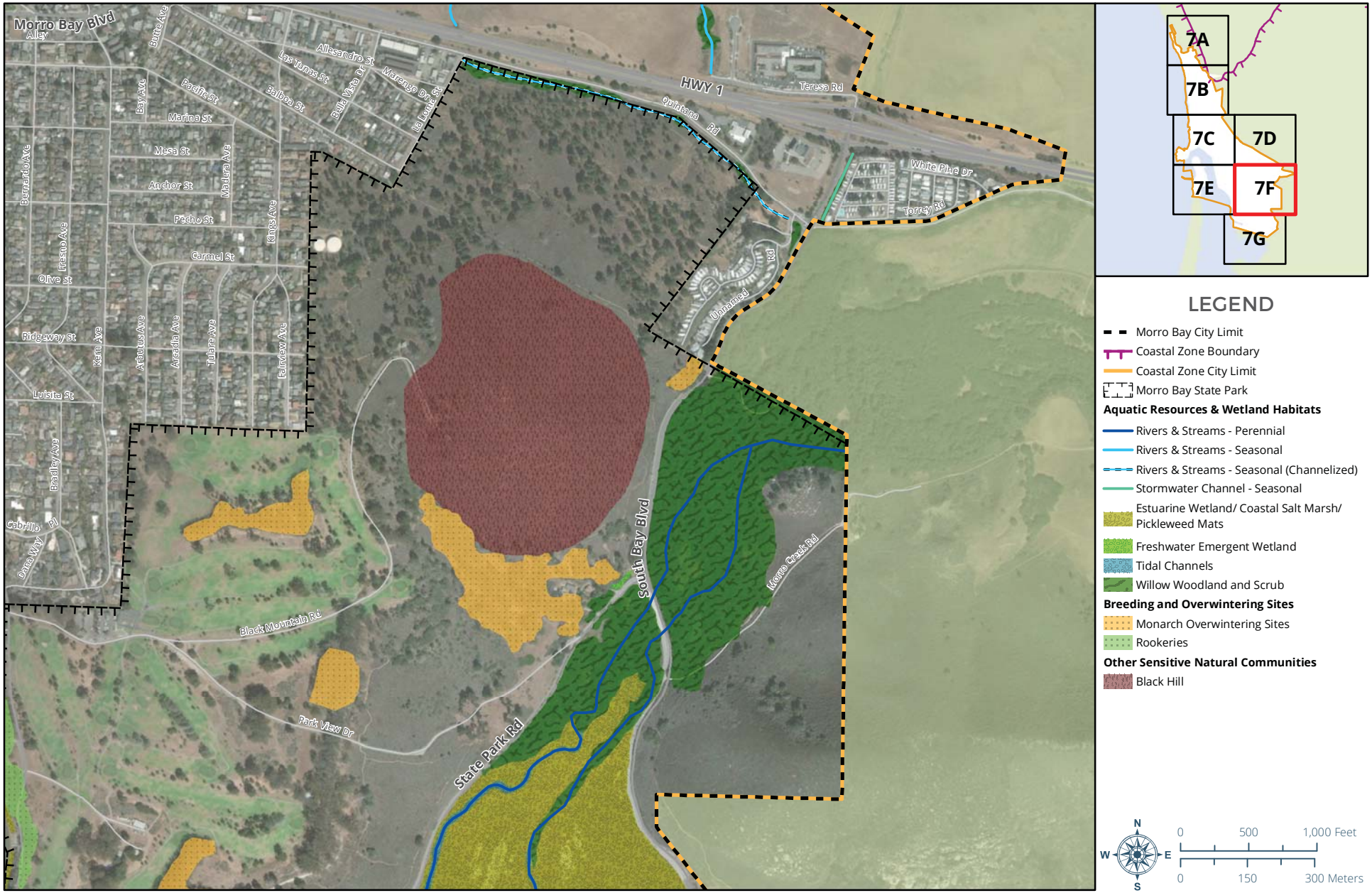


Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

Plan MORRO BAY

FIGURE 7E

Environmentally Sensitive Habitat Area Mapbook



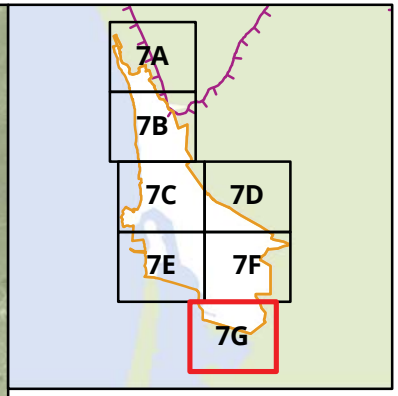
Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

FIGURE 7F

Environmentally Sensitive Habitat Area Mapbook

Plan MORRO BAY





LEGEND

- Morro Bay City Limit
- Coastal Zone Boundary
- Coastal Zone Within City
- Morro Bay State Park

Aquatic Resources & Wetland Habitats

- Rivers & Streams - Perennial
- Estuarine Wetland/ Coastal Salt Marsh/ Pickleweed Mats
- Tidal Channels

Breeding and Overwintering Sites

- Monarch Overwintering Sites
- Rookeries

Other Sensitive Natural Communities

- Backdune / Dune Scrub

N W E S

0 500 1,000 Feet

0 150 300 Meters

Sources: City of Morro Bay (2016); San Luis Obispo County (2016); Michael Baker Intl (2016); CA Dept of Parks & Recreation (2016); ESRI (2017).

FIGURE 7G

Environmentally Sensitive Habitat Area Mapbook

Plan MORRO BAY

Based on the sources and queries described above, the below described ESHA determinations have been established.

3.2.1 Aquatic Resources and Wetland Habitats

Several aquatic habitats are present within the City's coastal zone, including freshwater streams, riparian areas, and wetlands, as well as dune wetlands, coastal salt marshes and pickleweed mats, shallow bay and mudflats.

Rivers and Streams

Several creeks and their tributaries flow through the City and terminate into the Morro Bay estuary or directly into the Pacific Ocean within the City's coastal zone. These waterways include Chorro Creek, Morro Creek, Alva Paul Creek, and Toro Creek as well as several unnamed creeks with a bed and bank.

Willow riparian woodland and willow scrub often occurs along both perennial and intermittent streams. Some of these areas overlap portions of California red-legged frog, steelhead, and tidewater goby critical habitat. The multi-layered riparian vegetation, available water supply, and vegetative cover make these areas essential habitat for several special status species. Smaller streams may lack riparian canopy, but provide groundwater recharge, seasonally wet habitat, and also convey water, nutrients, and potential pollutants to the bay and the ocean, thus influencing quality of downstream receiving waters.

Creeks and Tributaries

Chorro Creek, Morro Creek, Alva Paul Creek, and Toro Creek are all located within the City's coastal zone. Morro Creek, the largest creek in the City's coastal zone terminates into the ocean. Morro Creek and Toro Creek form seasonal sand bars at the mouth of the streams that block direct flow to the sea during summer months, creating a lagoon between the river mouth and the Pacific Ocean. A large number of waterfowl and shorebirds use the temporary lagoon as a migratory stop-over and breeding ground. The lagoon also provides a habitat for a number of fish species, including the federally endangered and state threatened tidewater goby. This and other creeks and waterways provide suitable habitat for fish, bird and plant species. These areas should be considered ESHA in the updated LCP.

Note that some segments of these stream features were realigned and/or channelized in the past adjacent to Highway 1. These streams are noted using different symbology on the attached figures, because highly constrained stream features along roadways and channelized reaches typically require periodic maintenance for public safety and floodway protection, limiting their peak habitat quality. These stream segments are identified as "channelized" to differentiate these features from the natural watercourses that constitute ESHA.

Additionally, a number of stormwater channels that are visible on aerial photographs are also identified on the attached maps. These features convey runoff from roads and developed areas during storms. These features are not natural watercourses but some features do convey water into natural wetlands and waterways. These channels are identified as stormwater channels to differentiate these features from the natural watercourses that constitute ESHA.

Willow Woodland and Willow Scrub

Willow woodland and scrub habitats are areas in which riparian vegetation dominates and forms dense thickets commonly associated with floodplains and banks. These habitats are dominated by arroyo willow (*Salix lasiolepis*) and are common around the freshwater wetlands and waterways within the City's coastal zone. Other common species found in this habitat include coyote brush *(Baccharis pilularis)*, poison oak (*Toxicodendron diversilobum*), and dock (*Rumex* sp.). Note that willow stands are also found as components of back dune wetland complexes where they are not directly associated with streams. These sites are typically consistent with the Commission definition of wetlands due to the dominance of hydrophytic (i.e., water-loving) plant life.

Estuary and Shallow Bay

Shallow Bay, Mudflat and Eelgrass Habitat

The shallows of Morro Bay and the associated estuary consist of a varying degree of brackish water. These waters are a mixture of tidal waters of the Pacific Ocean and freshwaters from surrounding watersheds. These waters provide nesting and foraging habitat for many bird species in the area, as well as abundant fish habitat. These areas also provide suitable habitat for marine mammals such as otters and seals. Brackish waters also contain areas of steelhead designated critical habitats near mouths of certain creeks.

The shallow waters of Morro Bay support threatened populations of eelgrass, and provide abundant foraging habitat for coastal bird species. The eelgrass beds are essential nurseries and foraging habitat for fish and crustaceans.

Tidal Channels

At the mouth of the major streams, larger tidal channels are evident and interspersed with coastal salt marsh (identified below). The majority of these channels have non-vegetated beds and are largely exposed at low tide, allowing foraging habitat for coastal bird species and other wildlife.

Wetlands

Estuarine Wetlands, Coastal Salt Marsh, and Pickleweed Mat

The delta at the mouths of Chorro and Los Osos creeks is primarily vegetated with a pickleweed (*Salicornia pacifica*; also called *Sarcocornia pacifica* in some references) mat wetland. These wetlands are tidally influenced, and soils are saline due to the tidal waters. Pickleweed marsh is the dominant natural community where Chorro Creek terminates into Morro Bay estuary. This community most closely resembles the *Sarcocornia [=Salicornia] pacifica (Salicornia depressa*) Herbaceous Alliance, as defined by Sawyer et al. (2009). This alliance is ranked S3 under State Rarity rankings and thus is considered a special status vegetation community by CDFW. The marsh is influenced by seasonal variations of fresh, brackish, and saline water and the level of the water table that occurs close to or at the surface for at least part of the growing season. Common species in this community include pickleweed (*Salicornia virginica*), California saltbrush (*Atriplex californica*), spearscale (*A. triangularis*), slough sedge (*Carex obnupta*), saltgrass (*Distichlis spicata*), giant rush (*Juncus acutus*), creeping rush (*J. lesueurii*), sea lavender (*Limonium californicum*), coastal silverleaf (*Potentilla anserine),* American three-square (*Scirpus americanus*), common three-square (*S. pungens*), and arrowgrass (*Triglochin concinna*).

Other brackish and salt marsh habitats are present, including areas that provide suitable habitat for the endangered California seablite, a vascular plant that colonizes the upper portion of the intertidal zone. There is some overlap between suitable habitats for this species and eelgrass, so where both are present, the features were mapped with eelgrass. Additionally, coastal brackish marsh includes areas at mouths of streams where salt marsh bulrush and other salt-tolerant emergent hydrophytes are dominant, as well as potentially suitable habitat for another listed plant, salt marsh bird's beak.

In addition to including an S3-ranked sensitive natural community, these marshes provide essential habitat for many species known to utilize the marsh. This ESHA provides important nesting and breeding habitat for avian and aquatic species, as well as suitable habitat for special status plant species, as mentioned above, that include the federally and state endangered salt marsh bird's-beak and federally endangered California seablite.

Dune Wetlands

Dune wetlands occur under two general scenarios – they often occur where fresh water from rivers or streams accumulates behind a sandbar at the mouth of a coastal stream, and they can also occur where perched groundwater accumulates in low lying backdune areas, often due to lenses within the dune that restrict water movement, not directly tied to the mouth of a river or stream. The soils in these areas have slow drainage and form mesic environments with nutrient rich soils and high potential to support wetland vegetation. These communities are can be found where Alva Paul Creek enters the coastal natural communities within the City's coastal zone, and in low lying areas in the backdune of the dune complex along the coast. Dune wetlands are

dominated by sand dune sedge (*Carex pansa*), spiny rush (*Juncus acutus*), and brownheaded rush (*Juncus phaeocephalus*), with inclusion of arroyo willow and understory of dock, and coastal silverweed. These dune wetlands contain suitable habitat for special status plant species and provide nesting, foraging, and refuge for wildlife species.

Freshwater Emergent Wetlands

Multiple freshwater emergent wetlands are located within the Morro Bay coastal zone. These areas are dominated by wetland vegetation such as dock, brownheaded rush, and tule (*Schoenoplectus acutus*). Freshwater emergent wetlands are found both at springs and seasonal drainages and provide habitat for avian and special status plant species. Some of these wetlands also include areas of California red-legged frog critical habitat. A constructed wetland with open water patches interspersed with cattail (*Typha* sp.), California bulrush (*Schoenoplectus californicus*), and willows is also included in this type.

3.2.2 Other Sensitive Natural Communities

A variety of non-wetland sensitive natural communities are present within the City's coastal zone, providing essential habitat for many sensitive species in the area. These communities overlap in part with critical habitats for western snowy plover and Morro shoulderband snail (USFWS/NMFS 2017) and provide suitable habitat for many special status plants known to occur in the vicinity. Four types are described: foredune, backdune/ dune scrub, coastal bluff, and the Black Hill Natural Area. Each of these areas is discussed in detail below.

Foredune

The foredune natural community occurs where sand begins to accumulate and stabilize, with increased plant cover and diversity. This community occurs between the coastal strand and the backdune and stabilized dune scrub community. The predominant vegetation is dune mat, a sensitive natural community dominated by sand verbena (*Abronia maritima),* beach sand verbena *(Abronia umbellata)* and beach bur (*Ambrosia chamissonis*). Other common species include yarrow (*Achillea millefolium),* coastal sagewort *(Artemisia pycnocephala),* spearscale *(Atriplex* spp.), sea rocket (*Cakile maritima),* beach primrose (*Camissonia cheiranthifolia),* seaside daisy (*Erigeron glaucus),* and seaside golden yarrow (*Eriophyllum staechadifolium).* Foredune communities in Morro Bay are most closely associated with the *Ambrosia chamissonis-Abronia maritima-Cakile maritima* Association of the *Abronia latifolia - Ambrosia chamissonis* Herbaceous Alliance, an S3 ranked Sensitive Natural Community, as defined by Sawyer et al. (2009).

In addition to being a S3-ranked sensitive natural community, most of this ESHA overlaps with the western snowy plover critical habitat and provides essential habitat for other special status species, such as globose dune beetle (*Coelus globosus*), sandy beach tiger beetle (*Cicindela hirticollis gravida*), and legless lizard (*Anniella pulchra*). The foredune also contains suitable

habitat for many special status plant species such as Eastwood's larkspur (*Delphinium parryi* ssp. *eastwoodiae*) and coast woolly-heads (*Nemacaulis denudata* var. *denudata*). This community also provides abundant foraging habitat for many special status wildlife species in the coastal zone.

Backdune and Stabilized Dune with Dune Scrub

The stabilized dune and backdune natural community contains an increased abundance of herbaceous and woody vegetation. Some species previously mentioned in the foredune community are present. Dune scrub communities occur in stabilized coastal dune areas with higher water retention, more organic matter, and less salt (Sims 2010). Dune Scrub is the most abundant and diverse of the coastal natural communities and is dominated by shrubs of varying composition across the Morro Bay coastal zone. Dominant plant species in this community include: California sagebrush (*Artemisia californica),* coyote brush, heather (*Ericameria ericoides),* seaside golden yarrow, and beach lupine (*Lupinus chamissonis).* This community most closely resembles the *Lupinus chamissonis - Ericameria ericoides* Shrubland Alliance (S3), as defined by Sawyer et al. (2009). Site-specific studies have previously been used in the Morro Bay coastal zone to identify extent of backdune, stabilized dune and dunescrub.

In addition to being a S3 -ranked sensitive natural community, the dune scrub ESHA contains regions of the western snowy plover and Morro shoulderband snail critical habitats, and provides abundant nesting and foraging habitat for other avian and special status wildlife species. This community also provides suitable habitat for many special status plant species including Eastwood's larkspur, California seablite, and Blochman's leafy daisy (*Erigeron blochmaniae*).

Within the area analyzed in this LCP, invasive plant species, such as iceplant and European beach grass, often occur in the dune scrub community. This degrades the quality of this ESHA type; however, presence of invasive plant species does not eliminate the potential for special status species to occur in this community.

Coastal Bluff Scrub

In limited locations within the Morro Bay coastal zone, coastal bluffs are present at the transition between the beach, certain dune communities, and upland terraces. Although some of the bluff area is developed, some areas retain native vegetation consisting of bluff scrub, with sagebrush and coastal goldenbush (*Isocoma menziesii*) as well as spearscale. Vegetation in this community is adapted to strong winds, salt spray and thin soils. Coastal bluff provides an important transition between the beach, dune communities, when present, and upland inland habitats. Some areas are degraded with presence and dominance of invasive plant species.

Black Hill Natural Area

Black Hill supports a mixture of coastal sage scrub, chaparral, and annual and native grassland communities with scenic views over the estuary and south bay. The dominant community is coastal sage scrub. The site provides habitat for a variety of native birds and other wildlife. Rare plants, including Jones' layia, are known to occur in this natural area reserve. This location was previously identified as an important natural reserve area, and should be retained as ESHA in this update on the basis of continued presence of natural vegetation and habitat for special status plants and wildlife.

3.2.3 Breeding and Overwintering Sites

Morro Bay contains areas of known roosts, nests, and rookeries that are not associated with sensitive native vegetation. Morro Rock is a known peregrine falcon nest site. These areas are essential for the survival and reproduction of the above species and are reused year after year. These breeding and overwintering sites should therefore be considered ESHA in the updated LCP.

As previously noted, documented monarch overwintering roosts are identified in groves scattered throughout the coastal zone of Morro Bay, including a eucalyptus grove at Cerrito Peak and groves on State Park land. Not all eucalyptus groves support monarch overwintering habitats, and monarchs are known to use other tree species including Monterey pine (*Pinus radiata*) and Monterey cypress (*Cupressus macrocarpa*) as well as other large natives (Pelton et al. 2016), though no such sites are documented in Morro Bay at this time. Suitable groves for monarch overwintering provide a specific microclimate with high humidity, dappled light, access to water, and shelter from high winds and freezing temperatures (Pelton et al. 2016). These groves typically have dense trees and often occur on south- to west-facing slopes, which provide the most solar radiation (Leong et al. 2004 as cited in Pelton et al. 2016). The conditions within groves change over time as trees die and fall and new trees reach maturity. These changes in turn affect the microclimate of the stands. As stand health and suitability changes, monarchs may select new, more suitable overwintering locations not identified within this analysis, and abandon old sites. Thus, site-specific, appropriately timed surveys for overwintering monarch ESHA must be completed for project sites with potentially suitable groves. Site-specific studies have previously been used in the Morro Bay coastal zone to evaluate sites with potential and with old and vague records to determine if monarch overwintering roost habitats are present (e.g. Frey and Stevens 2007). Surveys for overwintering monarchs should be scheduled between mid-November through late-January for best detection.

A known heron, egret and cormorant rookery, now occupied primarily by cormorants, is located at Fairbanks Point. In 2017, heron and egret rookeries were located at Bayshore Park in eucalyptus and Monterey cypress trees, and in cypress and eucalyptus trees along the Embarcadero in front of the former power plant.

Heron rookeries may be occupied for many years, and increase in size as more birds build nests and occupy the site (Vermont Fish and Wildlife Department 2002). Rookeries are generally located near suitable feeding and foraging habitat for the birds that occupy and nest within the rookery. One study in Minnesota found that the median flight distance between a rookery and feeding sites was 2.7 kilometers for great blue herons, and 13.5 kilometers for great egrets (Custer and Galli 2002). Double-crested cormorants must also nest within close distance of a reliable source of food (Palmer 1962 as cited in Zeiner et al. 1990). Herons and cormorants generally prefer rookery sites with tall trees (Zeiner et al. 1990). Human disturbance around rookery sites can have varying effects on birds nesting within the rookery, and these effects can vary based on the size of the rookery, the degree of habituation to human activity, and the stage of the nesting cycle (Vermont Fish and Wildlife Department 2002). A study of heron rookeries in urban and rural landscapes in coastal British Columbia found that heron nesting productivity was negatively affected as human activities near the colonies increased (Vennesland and Butler 2004).

Although the current location of documented roosts and rookeries are provided in this analysis, the locations of these ESHAs are subject to change. Within active rookeries, the salt buildup from guano gradually causes the health decline and eventual loss of the eucalyptus stand. Without new recruitment of young trees under the dead and dying trees, eventually the stand will no longer support standing tall trees, live or dead, and suitability for nesting may decline. Similarly, as trees die and fall within known monarch overwintering roosts, the microclimate of the stands changes. As stand health and suitability declines, the known roosts and rookeries will likely migrate to new, more suitable locations not identified within this analysis. Implementation of seasonally timed surveys will aide in the identification of new roosts and rookeries, and determination of rookeries that are no longer in use.

4. OTHER ATTRIBUTE INFORMATION

Please note that the graphic information provided portrays the various biological resource boundaries as accurately as possible. This data is only a cartographic representation of the existing environment and should not be used on its own without field determination procedures to establish a precise boundary location. Conditions on the ground control permit and appeal jurisdictional boundary locations, based on Coastal Act definitions, regardless of how accurate the mapped boundary may be. It is important to emphasize that all adopted maps come with the following disclaimer:

> *Potential ESHA maps are not an exhaustive compilation of the habitat areas that meet the ESHA definition and are for planning assessments only. Site-specific biological evaluations and field observations to identify ESHA and other sensitive resources and potential impacts, including cumulative impacts, should be conducted at the time of proposed development or plan amendment application. Conditions on the ground control permit and appeal jurisdictional boundary locations, regardless of the accuracy of mapped boundaries.*

5. CONCLUSION

The proposed map changes to the City's ESHA mapping focused on improving ESHA identification within the Morro Bay coastal zone and expanding mapped habitat areas by including areas previously excluded due to lack of resource information (e.g., new records of special status species occurrences are now available). Figure 8 depicts a comparison of previous ESHA mapping, digitized from the MBLCP, with current ESHA mapping. The majority of revisions are the result of present-day availability of more published datasets, including higher resolution aerial photograph base maps. These data allowed for more precise mapping of stream centerlines, better distinction among existing plant community boundaries, and additional data that was not available when original ESHA maps were drawn, including extent of habitat suitable for eelgrass, California seablite, and other sensitive resources.

The ESHA information provided in this submittal is not intended to be an exhaustive compilation of the habitat areas that meet the ESHA definition. To ensure that all ESHAs within the City's coastal zone were considered, designated ESHAs may be buffered by a minimum of 50-100 feet, depending upon the habitats present and the proposed development. Buffers will be finalized in the LCP. The ESHAs and areas that fall within this buffer from potential ESHAs will require site-specific biological evaluations and field observations to identify ESHA and other sensitive biological resources prior to project development approval.

Updated ESHA information will improve ESHA identification, utilizing the best available information early in the development review stage. The data included within this submittal was produced in order to achieve consistency with the Coastal Act and are based on the latest available scientific information and precedential decisions. However, the Commission may require mandatory site reviews for projects that have the potential to impact ESHA, and provisions that require avoidance of resource impacts to be pursued for development before mitigation measures are implemented as an additional means of achieving compliance with the Coastal Act. These assurances along with the updated mapped ESHA are required for the LCP Update to be found consistent with Coastal Act Sections 30230, 30231, and 30240.

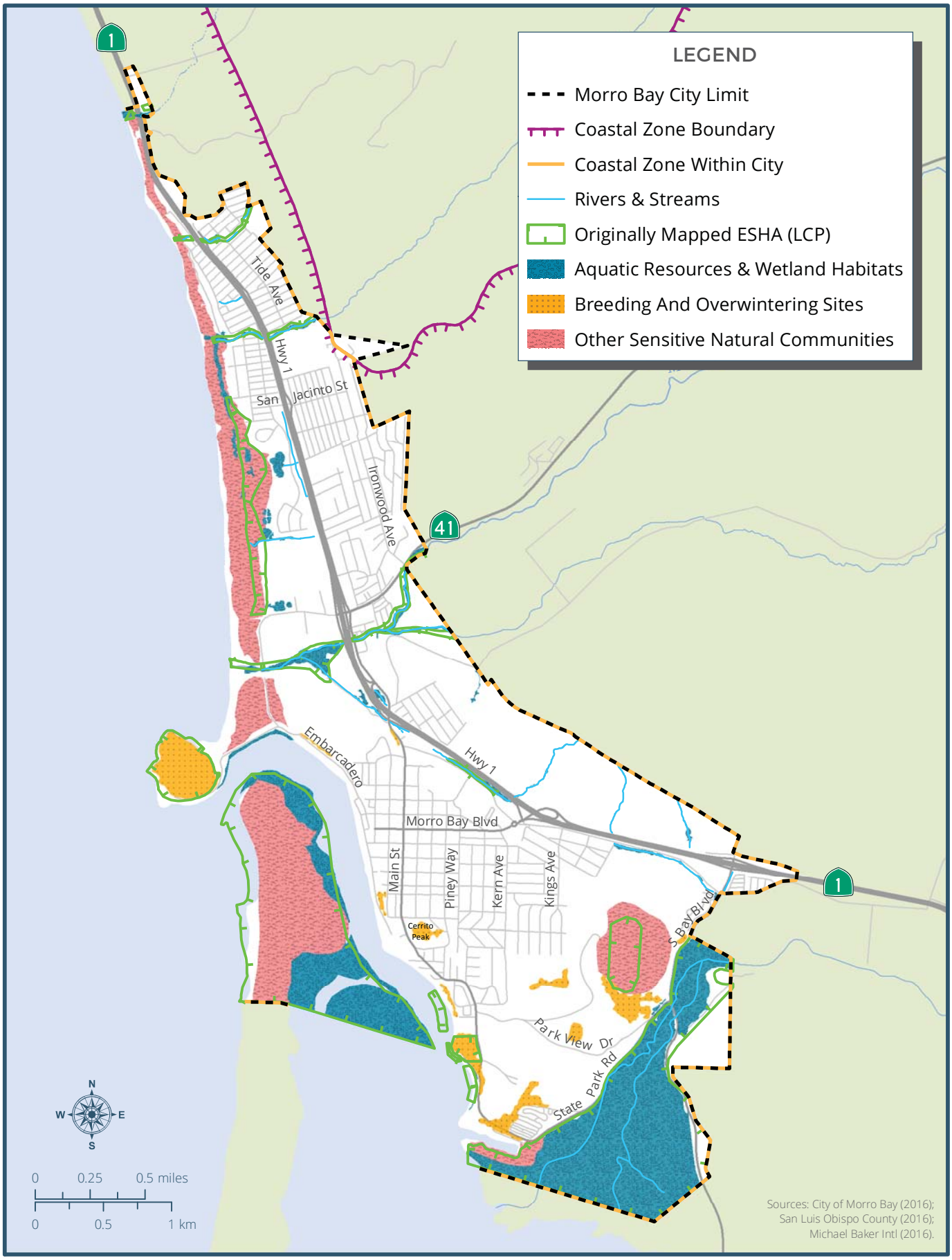


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FIGURE 8

ESHA Update Comparison Map

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APPENDIX A. PHOTOGRAPHS – MAY 2017 CONDITIONS



Photograph 1. View of dune wetland. Photo facing south.



Photograph 2. View of foredune natural community. Photo facing southwest.



Photograph 3. View of the foredune (left) natural community, adjoining the coastal strand. Photo facing south.



Photograph 4. View of backdune dune scrub natural community in the foreground. Photo facing north.



Photograph 5. View of Morro Creek, at coastal outlet. Photo facing east.



Photograph 6. View of Morro Creek, at coastal outlet. Freshwater emergent wetland seen at right. Photo facing west.



Photograph 7. Example of seasonal drainage and willow scrub within LCP area. Photo facing southeast.



Photograph 8. View of rookery at Fairbanks Point. Photo facing northwest.



Photograph 9. View of pickleweed marsh in Morro Bay Estuary. Photo facing southeast.



Photograph 10. View of pickleweed marsh in Morro Bay Estuary. Photo facing west.

APPENDIX B. SPECIAL STATUS SPECIES KNOWN TO OCCUR ON OR IN THE VICINITY OF THE LCP AREA

Table B-1. Special Status Species Known to Occur on or in the Vicinity of the LCP Area

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR / [2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Plants			
Arctostaphylos morroensis Morro manzanita	Threatened/-- G1 / S1 1B.1	Bloom period: December-March. Requires fine sands within maritime chaparral, cismontane woodland, pre-Flandrian dunes, and coastal scrub. Elevations: 5-205 meters.	**Moderate Potential**: Suitable habitat exists within coastal scrub of LCP. CNDDB documents three occurrences of this species in within 1 mile of the LCP. Specifically in Baywood Park (CNDDB 2014) and along the northern fork of the Crespi Loop trail in Morro Bay State Park (CNDDB 2015).
Arctostaphylos osoensis Oso manzanita	--/-- G1 / S1 1B.2	Bloom period: February-March. Grows in chaparral and in cismontane woodland on dacite porphyry buttes. Narrowly endemic to the mountains North of Los Osos Valley, San Luis Obispo County. Elevations: 300-500 meters.	**Moderate Potential.** CNDDB documents one occurrence of this species along the outer boundary of the 1 mile buffer zone. Specifically, at the intersection of the Crespi Trail and Chumash Trail, east of South Bay Boulevard (CNDDB 2015). The LCP contains limited habitat within the required elevational range of this species.
Astragalus didymocarpus var. *milesianus* Miles' milk-vetch	--/-- G5T2 / S2 1B.2	Bloom period: March-June. Clay substrates within coastal scrub. Elevations range: 20-90 meters.	**Moderate Potential**. Suitable habitat present within scrub habitats of LCP. Limited suitable soils present. CNDDB document one occurrence of this species within the LCP and one occurrence within the 1 mile buffer. Although these occurrences are dated prior to 1970, suitable habitat for this species occurs within the clay soils of the scrub habitat of the LCP.

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR / [2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Bryoria spiralifera twisted horsehair lichen	--/-- G3 / S1S2 1B.1	Endemic to the west coast of North America, ranging from San Luis Obispo County northward to Coos County, Oregon in communities ranging from maritime coniferous forest to maritime chaparral and dune communities (CALS 2008).	**Moderate Potential**. CNDDB documents one occurrence of this species within the 1 mile buffer of the LCP. This occurrence is located in the Elfin Forest of Los Osos (CNDDB 1991). Suitable habitat for this species occurs within the forested and chaparral habitats of the LCP, specifically on the pines in Black Hill Natural Area.
Calystegia subacaulis ssp. *episcopalis* Cambria morning-glory	--/-- G3T2 / S2 4.2	Bloom period: April-May. Rhizomatous, perennial herb that occurs in chaparral, cismontane woodland, and sparse to dense grassland covering sloped or flat areas in clay-rich soils; restricted to outer South Coast ranges in SLO and Santa Barbara Counties. Elevations: 60-500 meters.	**Moderate Potential.** Suitable habitat for this species occurs within the chaparral, woodland, and grassland habitats within the LCP. This species is documented within the chaparral, woodland, and grassland habitats 0.6 miles north of Black Hill summit (CNDDB 1995).
Castilleja densiflora var. *obispoensis* San Luis Obispo owl's-clover	--/-- G5T2 / S2 1B.2	Bloom period: April. Grows in valley and foothill grasslands. Occurs in Arroyo Grande, Pismo Beach, Port San Luis, San Luis Obispo, Lopez Mountain, Morro Bay, Cayucos, San Simeon, Pico Creek, Cambria, Piedras Blancas, and Burro Mountain. Elevations: 10-400 meters.	**High Potential**. CNDDB documents two occurrences of this species within the LCP. Suitable habitat for this species occurs within the grasslands, meadows, and seeps. Elements of suitable habitat present within LCP.
Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	Endangered/Endangered G4?T1 / S1 1B.2	Bloom period: May-October. Requires coastal salt marshes that line bays and estuaries. Elevations: 0-10 meters.	**High Potential.** This species was documented in close proximity to the LCP, in Montana de Oro State Park, by CNDDB in 2008. Suitable habitat for this species occurs within the marsh, and coastal dune habitats within the LCP.
Delphinium parryi ssp. *blochmaniae* dune larkspur	--/-- G4T2 / S2 1B.2	Chaparral, coastal dunes (maritime). On rocky areas and dunes. 15-375 m.	**High Potential**. Elements of suitable habitat present within LCP. CNDDB documents one occurrence of this species within the LCP (CNDDB 1899). The chaparral and coastal dune habitats within the LCP provide suitable habitats for this species.

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR/[2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Delphinium parryi ssp. *eastwoodiae* Eastwood's larkspur	--/-- G4T2 / S2 1B.2	Chaparral, valley and foothill grassland. Serpentine. Openings. 60-640 m.	**High Potential.** CNDDB documents one occurrence of this species within the LCP (CNDDB 1960). The serpentine influenced chaparral and grassland habitats within the LCP provide suitable habitats for this species.
Dithyrea maritima beach spectaclepod	--/Threatened G1 / S1 1B.1	Coastal dunes, coastal scrub. Sea shores, on sand dunes, and sandy places near the shore. 3-65 m.	**Moderate Potential**. This species was documented in close proximity to the LCP, in Montana de Oro State Park, by CNDDB in 2008. Suitable habitat for this species occurs within the sandy coastal dune habitats within the LCP.
Dudleya abramsii ssp. *bettinae* Betty's dudleya	--/-- G4T2 / S2 1B.2	Coastal scrub, valley and foothill grassland, chaparral. On rocky, barren exposures of serpentine within scrub vegetation. 20-250 m.	**Moderate Potential**. CNDDB documents two occurrences of this species within the LCP. Suitable habitat for this species occurs with the serpentine influenced scrub, grassland, and chaparral habitats within the LCP.
Dudleya abramsii ssp. *murina* mouse-gray dudleya	--/-- G4T2 / S2 1B.3	Chaparral, cismontane woodland, valley and foothill grassland. Serpentine outcrops. 25-535 m.	**Moderate Potential**. CNDDB documents one occurrence of this species within the rolling hills on the north side of the LCP (1988). Suitable habitat for this species occurs with the serpentine influenced woodland, grassland, and chaparral habitats within the LCP.
Dudleya blochmaniae ssp. *blochmaniae* Blochman's dudleya	--/-- G3T2 / S2 1B.1	Coastal scrub, coastal bluff scrub, chaparral, valley and foothill grassland. Open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil. 5-450 m.	**High Potential**. CNDDB documents one occurrences of this species within the LCP, and six occurrences within 1 mile of the LCP boundary. Suitable habitat for this species occurs with the serpentine influenced scrub, grassland, and chaparral habitats within the LCP.
Erigeron blochmaniae Blochman's leafy daisy	--/-- G2 / S2 1B.2	Coastal dunes, coastal scrub. Sand dunes and hills. 3-45 m.	**High Potential.** Species known to occur in Montana De Oro State Park (Sims 2010). Suitable habitat within the sand dunes and hills of coastal dune and scrub habitat within the City's Coastal Zone.

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR/[2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Extriplex joaquinana San Joaquin spearscale	--/-- G2 / S2 1B.2	Chenopod scrub, alkali meadow, playas, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with Distichlis spicata, Frankenia, etc. 1-835 m.	**Moderate Potential**. Suitable habitat present within Dune wetlands of LCP.
Horkelia cuneata var. *sericea* Kellogg's horkelia	--/-- G4T1? / S1? 1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Old dunes, coastal sandhills; openings. 5-215 m.	**Moderate Potential**. Elements of suitable habitat present within coastal scrub and chaparral of LCP.
Layia jonesii Jones' layia	--/-- G2 / S2 1B.2	Chaparral, valley and foothill grassland. Clay soils and serpentine outcrops. 5-400 m.	**Present**. Suitable habitat present in chaparral and grassland habitats with clay and serpentine influence within LCP. This species is known to occur on Black Hill within the LCP (LCP 1982).
Monardella sinuata ssp. *sinuata* southern curly-leaved monardella	--/-- G3T2 / S2 1B.2	Coastal dunes, coastal scrub, chaparral, cismontane woodlands. Sandy soils. 0-300 m.	**Moderate Potential**. Suitable habitat present within dune, scrub and chaparral habitats within LCP.
Nemacaulis denudata var. *denudate* coast woolly-heads	--/-- G3G4T2 / S2 1B.2	Coastal dunes. 0-100 m.	**Moderate Potential**. Suitable habitat present within coastal dune and scrub habitat within LCP
Suaeda californica California seablite	Endangered/-- G1 / S1 1B.1	Marshes and swamps. Margins of coastal salt marshes. 0-5 m.	**Present**. Known to occur along margins of Morro Bay estuary within the City's Coastal Zone (Sims 2010; CNDDB). Suitable habitat present in estuary and associated marsh.
Sulcaria isidiifera splitting yarn lichen	--/-- G1 / S1 1B.1	Coastal scrub. On branches of oaks and shrubs in old growth coastal scrub. 20-55 m.	**Moderate Potential**. Suitable habitat present in coastal scrub habitat within LCP.
Vegetation Communities			
Central dune scrub	--/--/-- tracked by CDFW as sensitive natural community	A dense coastal scrub community of scattered shrubs, subshrubs, and herbs generally less than 1m tall.	**Present.**

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR / [2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Coastal brackish marsh	--/--/-- tracked by CDFW as sensitive natural community	Dominated by perennial, emergent, herbaceous monocots to 2m tall. Cover is often complete and dense. Similar to Coastal Salt Marshes, but brackish from freshwater input. Usually at the interior edges of coastal bays and estuaries or in coastal lagoons.	**Present.**
Northern coastal salt marsh	--/--/-- tracked by CDFW as sensitive natural community	Highly productive, herbaceous and suffructescent, salt-tolerant hydrophytes forming moderate to dense cover and up to 1m tall. Usually found along sheltered inland margins of bays, lagoons, and estuaries. These hydric soils are subject to regular tidal inundation by salt water for at least part of each year.	**Present.**
Invertebrates			
Bombus caliginosus obscure bumble bee	--/-- G4? / S1S2	Coastal areas from Santa Barbara county to north to Washington state. Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	**High Potential.** Majority of preferred food plants present within LCP.
Cicindela hirticollis gravida sandy beach tiger beetle	--/-- G5T2 / S2	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico. Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	**High Potential.** Suitable habitat present in the Dune communities of the LCP.
Coelus globosus globose dune beetle	--/-- G1G2 / S1S2	Inhabitant of coastal sand dune habitat; erratically distributed from Ten Mile Creek in Mendocino County south to Ensenada, Mexico. Inhabits foredunes and sand hummocks; it burrows beneath the sand surface and is most common beneath dune vegetation.	**High Potential**. Suitable habitat present within LCP along foredune natural community. Species known to occur on sandspit at the south of the LCP.
Danaus plexippus pop. 1 monarch - California overwintering population	--/-- G4T2T3 / S2S3	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Present**. This species is known to occur within the LCP. CNDDB documents 9 occurrences of monarch overwintering populations.

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR / [2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Plebejus icarioides moroensis Morro Bay blue butterfly	--/-- G5T2 / S2	Inhabits stabilized dunes & adjacent areas of coastal San Luis Obispo & NW Santa Barbara counties. Larval food plant thought to be Lupinus chamissonis.	**High Potential**. CNDDB documents three occurrences of this species within the LCP. The required host plant species is present in the coastal scrub habitat.
Fish			
Eucyclogobius newberryi tidewater goby	FE / -- SSC G3 / S3	Occurs in brackish and freshwater shallow lagoons and slow-moving lower stream reaches. Requires fairly calm and still waters, but not stagnant. Avoids open areas with strong currents or wave action.	**Present.** USFWS reports that the mouth and lower reach of Toro Creek, which is designated critical habitat, was occupied at the time designated critical habitat was updated in 2013 (78 FR 8745 8819). This species is known to occur within the project area.
Oncorhynchus mykiss irideus steelhead – Southern California DPS	FE / -- SSC G5T1Q / S1	Occurs in riparian, emergent, and palustrine habitats. Spawning and rearing occurs in cool, clear fast-flowing streams with abundant gravel or cobble and riffles. Feeds and forages in open waters within estuarine subtidal and riverine habitats. Connectivity to the Pacific Ocean is required to complete its life cycle.	**Present.** This species is known to occur within Chorro Creek, and the outlet into the Morro Bay estuary.
Amphibians			
Rana draytonii California red-legged frog	FT / -- SSC G2G3 / S2S3	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**High Potential.** Suitable habitat present within LCP. In addition to the 7 CNDDB occurrences documented within LCP, the LCP also contains designated critical habitat for this species.
Reptiles			
Anniella pulchra nigra black legless lizard	--/-- G3G4T2T3Q / S2 SSC	Sand dunes and sandy soils in the Monterey Bay and Morro Bay regions. Inhabit sandy soil/dune areas with bush lupine and mock heather as dominant plants. Moist soil is essential.	**Low Potential.** Melanistic legless lizards do occur in the LCP; however, subspecies *nigra* is now believed to occur only in the Monterey Bay region, while melanistic individuals of legless lizards in Morro Bay are now believed to be most closely related to silvery legless lizard (Parham and Pappenfuss 2008; 2010).

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR/[2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Anniella pulchra silvery legless lizard	--/-- G3G4T3T4Q / S3 SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. Prefer soils with high moisture content.	**High Potential.** Suitable habitat present within LCP and reported from the dunes in the vicinity.
Emys marmorata western pond turtle	--/-- G3G4 / S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for e	**High Potential.** Suitable habitat present within creeks and wetlands of LCP. The LCP contains the year-round freshwater water and substantial aquatic vegetation.
Phrynosoma blainvillii coast horned lizard	--/-- G3G4 / S3S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, & abundant supply of ants & other insects.	**High Potential.** Elements of suitable habitat present within LCP include dunes and dune scrub.
Birds			
Accipiter cooperii Cooper's hawk	--/-- G5 / S4 WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	**Moderate Potential.** CNDDB documents one occurrence of this species within the LCP. Suitable nesting habitat for this species occurs throughout the LCP.
Charadrius alexandrinus nivosus western snowy plover	Threatened/-- G3T3 / S2S3 SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Present.** This species is known to occur within the coastal dune and sand spit habitat of the City's Coastal Zone.
Laterallus jamaicensis coturniculus California black rail	--/Threatened G3G4T1 / S1 FP	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year & dense vegetation for nesting habitat.	**High Potential.** CNDDB documents one occurrence of this species within the LCP. This occurrence was documented in 2001 in the marsh/estuary region of the study area.

Scientific Name Common Name	Status [1]Fed / [2]State ESA [3]CRPR / [2]CDFW [4]G-Rank / S-Rank	Habitat Preference / Requirements	Potential for Occurrence / Basis for Determination
Rallus longirostris obsoletus California clapper rail	Endangered/Endangered G5T1 / S1 FP	Salt-water & brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**Low Potential.** CNDDB document one occurrence of this species within the LCP, dated 1939. Suitable habitat occurs for this species in the pickleweed dominated marsh and estuary habitats of the LCP.
Mammals			
Antrozous pallidus pallid bat	--/-- G5 / S3 SSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Low Potential.** Elements of suitable habitat present within project site; however, project site lacks preferred cliff faces and tall buildings for roosting. No occurrence records exist on or adjacent to project site.
Dipodomys heermanni morroensis Morro Bay kangaroo rat	Endangered/Endangered G3G4TH / SH FP	Coastal sage scrub on the south side of Morro Bay. Needs sandy soil, but not active dunes, prefers early seral stages.	**Low Potential.** Elements of suitable habitat present within project site; however, the species has not been seen in the wild since 1986.

Regional Vicinity refers to within a 5 mile radius of site.

FT = Federally Threatened
FC = Federal Candidate Species
FE = Federally Endangered
SE = State Endangered
ST = State Threatened
SR = State Rare
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

CRPR (CNPS California Rare Plant Rank):
1A=Presumed Extinct in California
1B=Rare, Threatened, or Endangered in California and elsewhere
2=Rare, Threatened, or Endangered in California, but more common elsewhere
CRPR Threat Code Extension:
.1=Seriously endangered in California (> 80% of occurrences threatened / high degree and immediacy of threat)
.2=Fairly endangered in California (20-80% occurrences threatened)
.3=Not very endangered in California (<20% of occurrences threatened)

G-Rank/S-Rank = Global Rank and State Rank as per NatureServe and CDFW's CNDDB RareFind 5.

Table Crosswalk for Habitat Classifications used in the EIR, Community Baseline Assessment, the NWI, and the ESHA Report.

EIR Habitat Classification	Community Baseline Assessment Classification	Mapped as ESHA?	NWI Classification
Terrestrial Woodlands			
Coastal Oak Woodland	Coastal Oak Woodland Montane Hardwood Forest	No major stands in the coastal zone within the City. Could be present in coastal zone in other areas of the Plan Area, and depending on composition, could be ESHA.	n/a
Coniferous Woodlands	Montane Hardwood-Coniferous Forest	Some are Breeding and Overwintering sites	n/a
Eucalyptus groves	Eucalyptus Forest	Some are Breeding and Overwintering sites	n/a
Terrestrial Shrub-dominated Communities			
Chamise Chaparral	Chamise-Redshank Chaparral.	Yes - Black Hill Natural Area	n/a
Mixed Chaparral	Mixed Chaparral	Yes - Black Hill Natural Area	n/a
Coastal scrub	Coastal Scrub	Yes - Black Hill Natural Area; Coastal Bluff Scrub	n/a
Coastal dune scrub	Coastal dune scrub	Yes - Backdune and Stabilized Dune with Dune Scrub	n/a
Terrestrial Herbaceous Communities			
Foredune	included with Dune Scrub	Yes - Foredune	n/a
Annual Grasslands	Annual Grasslands	No. Typically does not meet criteria to be considered ESHA	n/a
Perennial Grasslands	Perennial Grasslands	No major stands known in the coastal zone within the City; could be present in coastal zone in other areas of the Plan Area, and depending on composition, could be ESHA	n/a
Agricultural Land Cover Types			
Pasture	Pasture	No. Typically does not meet criteria to be considered ESHA	n/a
Agricultural Fields	Agricultural Areas	No. Typically does not meet criteria to be considered ESHA	n/a
Sparsely/Non-Vegetated Terrestrial Habitats and Developed Areas			
Coastal Strand	Barren	No. Typically does not meet criteria to be considered ESHA	Adjoins edge of Marine areas
Morro Rock; Other Barren Areas	Barren	Morro Rock is a Breeding and Overwintering sites	n/a
Urban	Urban	No. Typically does not meet criteria to be considered ESHA	n/a
Drainages, Riparian Areas, Wetlands, and Other Waters			
Rivers and Streams	Streams and Riverine	Yes- Rivers and Streams/Creeks and Tributaries	Riverine; Palustrine Forested, Palustrine Scrub-Shrub, Palustrine Emergent

EIR Habitat Classification	Community Baseline Assessment Classification	Mapped as ESHA?	NWI Classification
Riparian Thickets and Woodlands	Valley Foothill Riparian Forest Montane Riparian Forest	Yes- Willow woodland and willow scrub	Palustrine Forested, Palustrine Scrub-Shrub
Estuarine Wetlands/Coastal Salt Marsh and Pickleweed Mat	Wetlands - Estuarine Saline emergent wetlands	Yes - Estuarine Wetlands, Coastal Salt Marsh, and Pickleweed Mat	Estuarine Wetlands
Freshwater Wetlands	Freshwater Emergent Wetlands	Yes- Freshwater Emergent Wetlands	Palustrine emergent and Palustrine scrub-shrub wetlands
Dune Wetlands	Freshwater Emergent Wetlands	Yes- Dune Wetlands	Palustrine emergent and Palustrine scrub-shrub wetlands
Freshwater Ponds	Freshwater Ponds	Yes in part - with Freshwater Emergent Wetlands	Palustrine and Lacustrine depending on size
Estuarine/ mudflats, tidal channels, and shallow bay, and marine open waters	Estuarine and Marine Deepwater	Yes, in part. - Shallow Bay, Mudflat and Eelgrass Habitat; Tidal Channels.	Estuarine, Marine

Sources: *Plan Morro Bay*, City of Morro Bay 2018
Community Baseline Assessment, City of Morro Bay, 2017
Environmentally Sensitive Habitat Assessment (ESHA) Baseline Report, City of Morro Bay 2017
National Wetlands Inventory, USFWS, 2018

Appendix E

Circulation Element Update Final Technical Report

Morro Bay Circulation Element Update

Draft Technical Report

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Introduction

This report describes existing and future transportation conditions in the City of Morro Bay. This includes conditions related to driving, walking, bicycling, and transit in the City as well as parking and coastal access.

This report serves as a companion document to the Circulation Element of the Morro Bay General Plan Update. It describes the technical analysis results under Existing, Buildout, and Buildout Plus Project conditions.

Existing conditions reflect the current roadway network and traffic volumes collected in 2016. Buildout conditions reflect buildout of the City's current General Plan land uses. Buildout Plus Project reflects the updated General Plan land uses proposed as a part of the current update.

Analysis Methods

Intersection Analysis

The level of service thresholds for intersections and the pedestrian, bicycle, and transit modes based on the 6th Edition Highway Capacity Manual (HCM) are presented in Table 1.

Table 1: Intersection Level of Service Thresholds

Signalized Intersections[1]		Stop Sign Controlled Intersections[2]		Two-Way Stop Sign Controlled[3]		Pedestrian, Bicycle, and Transit Modes[4]	
Control Delay (seconds/vehicle)	Level of Service	Control Delay (seconds/vehicle)	Level of Service	Control Delay (seconds/vehicle)	Level of Service	LOS Score	Level of Service
≤ 10	A	≤ 10	A	≤ 5	A	≤ 2.00	A
> 10 - 20	B	> 10 - 15	B	> 5 - 10	B	> 2.00-2.75	B
> 20 - 35	C	> 15 - 25	C	> 10 - 20	C	> 2.75-3.50	C
> 35 - 55	D	> 25 - 35	D	> 20 - 30	D	> 3.50-4.25	D
> 55 - 80	E	> 35 - 50	E	> 30 - 45	E	> 4.25-5.00	E
> 80	F	> 50	F	> 45	F	> 5.00	F

1. Source: Exhibit 18-4 of the 2010 *Highway Capacity Manual.*
2. Source: Exhibits 19-1 and 20-2 of the 2010 Highway Capacity Manual.
3. Source: Exhibits 19-2 of the 2010 Highway Capacity Manual.
4. Source: Exhibit 16-5 and 16-6 of the 2010 Highway Capacity Manual, assuming 60 ft^2/p for pedestrian mode.

The study intersections were analyzed with the Synchro 10 software package applying the HCM 6th Edition methods.

Segment Analysis

The study roadway segments were evaluated for auto, transit, pedestrians, and bicycles using the LOS+ software, which applies the HCM 2010 methods. The LOS score thresholds are shown in Table 2.

Table 2: Roadway Segment Level of Service Thresholds

Auto, Pedestrian, Bicycle, and Transit Modes, Segments	
LOS Score	Level of Service
≤ 2.00	A
> 2.00-2.75	B
> 2.75-3.50	C
> 3.50-4.25	D
> 4.25-5.00	E
> 5.00	F

1. Source: Exhibits 16-5 and 16-6 of the 2010 Highway Capacity Manual, assuming 60 ft^2/p for pedestrian mode

Existing Conditions

This section is divided into the following subsections: 1) automobile intersection operations, 2) segment operations, 3) neighborhood traffic, 4) goods movement, 5) vehicle miles traveled, 6) collisions, 7) parking, 8) walking, 9) bicycling, and 10) transit

1. Automobile Intersection Operations

Traffic counts were collected at the study intersections in 2016 and are shown on Figure 1. Automobile intersection operations are typically described in terms of average delay experienced per vehicle during the peak hour of travel. The delay per vehicle correlates to an LOS grade ranging from LOS A for free-flowing conditions to LOS F for highly congested conditions. The City does not have a formal LOS threshold defining acceptable operations, but historically has applied the Caltrans target of LOS C or better. Operations at key intersections in the City in March 2016 are shown in Table 3 during the Saturday midday and weekday PM peak hours.

Table 3: Level of Service at Key Intersections (2016)

Intersection	Peak Hour	V/C[1]	Delay[2]	LOS
1. San Jacinto Street/ Highway 1	Week PM	0.77	18.2	B
	Sat MID	0.72	17.1	B
2. San Jacinto Street/ Main Street[3]	Week PM	-	6.7 (13.9)	- (B)
	Sat MID	-	5.0 (10.0)	- (A)
3. State Route 41/ Highway 1 SB Ramps[3]	Week PM	0.40	**7.5 (28.7)**	**- (D)**
	Sat MID	0.30	6.7 (18.2)	- (C)
4. State Route 41/ Main Street	Week PM	0.99	**37.6**	**E**
	Sat MID	0.82	**28.3**	**D**
5. Beach Street/ Main Street	Week PM	0.52	13.9	B
	Sat MID	0.75	23.9	C
6. Morro Bay Boulevard/ Quintana Road	Week PM	0.70	12.7	B
	Sat MID	0.59	10.7	B

1. Volume to capacity ratio reported for worst movement.
2. HCM 2010 average control delay in seconds per vehicle.
3. For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.
Note: Unacceptable operations shown in bold text.

The intersection of SR 41/Main Street (#4) operates at LOS E during the weekday PM peak hour and LOS D during the Saturday midday peak hour. These are below the Caltrans target of LOS C or better. This all-way stop-controlled intersection and nearby ramps have been under study for improvements through the Caltrans project development process and a roundabout is now planned. The southbound approach to the SR 41/Highway 1 southbound ramps intersection (#3) operates at LOS D during the weekday PM peak hour. All other intersections perform at or above LOS C.

Figure 1: Existing Volumes



Existing Peak Hour Volumes

1.

Highway 1	San Jacinto St
7(11)	97(80)
657(695)	18(13)
55(48)	128(91)
7(15)	44(45)
15(22)	623(755)
43(61)	242(144)

2.

Main St	San Jacinto St
75(59)	9(9)
60(50)	59(51)
3(6)	9(13)
112(58)	107(90)
100(56)	87(91)
94(93)	21(12)

3.

Highway 1 SB Ramp	State Route 41
26(44)	144(108)
7(11)	329(262)
64(69)	
83(85)	
86(81)	

4.

Main St	State Route 41
160(95)	49(62)
138(114)	262(287)
42(57)	144(230)
92(53)	77(72)
251(227)	188(158)
37(55)	244(202)

5.

Main St	Beach St
180(286)	21(22)
272(318)	7(15)
24(18)	1(2)
201(249)	29(63)
10(28)	249(263)
43(105)	5(12)

6.

Quintana Rd	Morro Bay Blvd
91(136)	246(238)
3(3)	466(386)
258(240)	10(11)
76(64)	2(6)
474(404)	3(4)
4(5)	20(10)

Legend:

xx(yy) - PM(Sat Mid) Peak Hour Traffic Volumes

(x) - Study Intersection

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

2. Roadway Segment Operations

Roadway segment operations in 2016 are described for pedestrians, bicycles, and vehicles in Table 4. The Embarcadero north of Pacific Street, Morro Bay Boulevard west of Quintana Road, and Main Street south of Radcliff Drive are short segments, with a high number of stops per mile, decreasing their auto performance. Main Street south of Radcliff Drive and westbound SR 41 east of Main Street have high free-flow speeds and no sidewalks, resulting in pedestrian LOS D. All other segments perform at or above LOS C. The City and Caltrans do not have LOS thresholds for pedestrian and bicycle facilities.

Table 4: Roadway Segment Operations (2016)

Segment	Peak Hour	Direction	Pedestrian		Bicycle		Vehicle		
			LOS Score[1]	LOS[1]	Score[1]	LOS[1]	V/C Ratio	Score[1]	LOS[1]
Embarcadero - North of Beach Street	Week PM	NB	2.10	B	4.00	B	0.10	3.28	C
		SB	1.51	A	2.76	C	0.10	3.02	C
	Sat MID	NB	2.48	B	3.02	C	0.18	3.28	C
		SB	1.77	A	2.97	C	0.15	3.02	C
Embarcadero - North of Pacific Street	Week PM	NB	1.32	A	2.86	C	0.08	3.72	D
		SB	1.16	A	2.74	B	0.07	3.72	D
	Sat MID	NB	1.51	A	3.38	C	0.09	3.72	D
		SB	1.43	A	3.46	C	0.10	3.72	D
Embarcadero - South of Pacific Street	Week PM	NB	1.13	A	2.54	B	0.05	3.28	C
		SB	1.12	A	2.68	B	0.06	3.28	C
	Sat MID	NB	1.32	A	3.12	C	0.07	3.28	C
		SB	1.27	A	3.12	C	0.07	3.28	C
Morro Bay Boulevard - West of Quintana Road	Week PM	EB	2.37	B	2.43	B	0.24	3.62	D
		WB	2.53	B	2.50	B	0.28	3.62	D
	Sat MID	EB	2.27	B	2.38	B	0.22	3.62	D
		WB	2.47	B	2.47	B	0.26	3.62	D
Main Street - South of Radcliff Drive	Week PM	NB	2.56	B	2.34	B	0.17	3.28	C
		SB	3.79	D	2.48	B	0.23	3.02	C
	Sat MID	NB	3.04	C	2.58	B	0.25	3.28	C
		SB	3.94	D	2.55	B	0.24	3.02	C
State Route 41 - East of Main Street	Week PM	EB	3.39	C	0.75	A	0.23	3.16	C
		WB	3.32	C	0.71	A	0.22	3.16	C
	Sat MID	EB	3.31	C	0.71	A	0.21	3.16	C
		WB	3.56	D	0.82	A	0.26	3.16	C

1. HCM 2010 pedestrian/bicycle score and LOS
2. Embarcadero - North of Pacifc Street, Morro Bay Boulevard - West of Quintana Road, and Main Street - South of Radcliff Drive are short segments, increasing their stops per mile. This is the likely cause of their poor Vehicle LOS.
3. Main Street - South of Radcliff Drive SB and State Route 41 - East of Main Street WB have high Freeflow Speeds and no sidewalks. These are the likely causes of their poor Pedestrian LOS.

3. Neighborhood Traffic

There are a variety of different neighborhood types throughout Morro Bay. Most neighborhoods are served by a well-defined grid of local streets. This grid system spreads traffic by providing a variety of routes to destinations.

Some collector streets pass through residential areas. While traffic volumes along these corridors are well below the roadway's carrying capacity, the adjacent residences can be impacted by excessive vehicle volumes and speeds. Table 5 summarizes the volumes and speeds along key neighborhood roadway corridors in 2016.

Table 5: Neighborhood Roadway Traffic Conditions (2016)					
Segment	Peak Hour	Daily Traffic	Average Daily Traffic	85th Percentile Speed (mph)	Average 85th Percentile Speed (mph)
Kern Avenue - Anchor Street to Olive Street	Thursday Friday Saturday	1365 1285 1181	1277	23.9 33.0 32.7	29.9
Piney Way - South Street to Vista Street	Thursday Friday Saturday	1524 1470 1326	1440	32.7 32.7 32.5	32.6
Beachcomber Street - Mindoro Street to Luzon Street	Thursday Friday Saturday	355 353 416	375	28.0 26.4 25.0	26.5
Greenwood Avenue - Elena Street to San Joaquin Street	Thursday Friday Saturday	307 287 180	258	26.3 25.9 24.4	25.5

The roadways listed in Table 5 are classified as major collectors in the California Road Systems maps. However, they meet the criteria for a residential district as defined in Section 515 of the California Vehicle Code, and therefore have a prima facie speed limit of 25 mph. The segments of Kern Avenue and Piney Way show 85th percentile speeds of 29.9 and 32.6 mph, respectively.

4. Goods Movement

Local businesses rely on roadways and other City infrastructure, such as piers, to transport goods. The following roadways, shown on Figure CIR-4, are identified as truck routes in the City's Circulation Element:

- Main Street from Yerba Buena Street to Morro Bay Boulevard
- SR 41/Atascadero Road east of Highway 1
- Quintana Road from Main Street to Morro Bay Boulevard and east of South Bay Boulevard
- Morro Bay Boulevard from Main Street to Highway 1
- Beach Street from the Embarcadero to Main Street
- Harbor Street from the Embarcadero to Main Street
- Highway 1 through the City

Downtown and Embarcadero area businesses receive deliveries from trucks parked at curbside spaces, in off-street lots, or in designated loading zones. Community members have also expressed concern about delivery trucks occasionally parked in the middle of streets, which can create or exacerbate congestion.

Commercial fishing and aquaculture offloading occurs at a number of piers along the Embarcadero. The City operates a launch ramp facility, fish cleaning station, and wash-down area for trailered vessels. No facilities are provided for large vessel haul-outs.

5. Vehicle Miles Traveled

VMT measures travel on roadways by all types of motorized vehicles carrying passengers or cargo. Each mile traveled is counted as one vehicle mile regardless of the number of people in the vehicle. VMT is typically expressed as VMT per day. Table 6 shows daily VMT in Morro Bay as of 2016. In this table, the column titled "Daily VMT in SOI" reflects the vehicle miles traveled entirely within city limits and the City's sphere of influence. The column titled "Daily VMT in the County" reflects the vehicle miles traveled within the City's sphere of influence and those trips that either originated in San

Luis Obispo County and concluded in Morro Bay, or vice versa. The final column, "Daily VMT in State," reflects vehicle miles traveled within the City's sphere of influence, and those trips that either originated in Morro Bay and concluded anywhere in California (including San Luis Obispo County), or vice versa.

Table 6: Vehicle Miles Traveled in Morro Bay (2016)

Trip Type	Daily VMT in SOI	Daily VMT in County	Daily VMT in State
Origin and destination within City SOI	52,256	52,256	52,256
Origin only within City SOI	16,061	48,024	63,788
Destination only within City SOI	16,422	50,924	66,688
Total	84,739	151,205	182,732

1. SOI = Sphere of Influence
2. Source: SLOCOG and CA Statewide Travel Demand Models

Daily VMT is shown for trips with both an origin and destination within the City and trips with either an origin or destination in the City, but not both. A Morro Bay resident driving to dinner on the Embarcadero would have an origin and destination within the City. A Morro Bay resident driving to work in Paso Robles would have an origin only within the City, while an Atascadero resident driving to work in Morro Bay would have a destination only within the City. A Fresno resident visiting Morro Bay would have a destination only within the City, and the trip length and VMT would be adjusted to reflect the portion of the trip occurring outside of San Luis Obispo County.

VMT estimates were extracted from the SLOCOG Travel Demand Model calibrated for use in Morro Bay. The SLOCOG Model tracks trips within the County but does not reflect regional trips that continue to destinations outside of the County. The California Statewide Model was used to determine the average trip lengths for trips leaving San Luis Obispo County, which were then used to forecast the daily VMT.

Trips with an origin and destination in the City were counted as being 100 percent generated by the City. Trips that have an ending or beginning in the City were counted as being 50 percent generated by the City. Trips that pass through the City but do not begin or end within the City were excluded from the VMT analysis.

6. Collisions

The Statewide Integrated Traffic Records System (SWITRS) is a tool used by the California Highway Patrol to collect and process collision information. Injury and fatal collision hot-spots (including vehicles, pedestrians, and bicyclists) throughout the City were reviewed based on five years of collision data. Most of the collisions occur at intersections along Highway 1 and along the Main Street and Morro Bay Boulevard corridors.

The California Office of Traffic Safety compares collision rates for cities throughout the state. There are 105 cities in Morro Bay's category with a population between 10,001 and 25,000. In 2013, Morro Bay's fatal and injury collision rank was 43 of 105, indicating that 42 similar-sized cities had higher collision rates and 62 had lower rates.

The 10 intersections with the largest number of reported collisions are summarized in Table 7. Where these intersections overlap with the intersections identified in the current General Plan, those values (for the period 1982–1984) are provided as well.

Table 7: High Collision Locations in Morro Bay (2012-2014)

Intersection	2012	2013	2014	Total	1982-1984
Highway 1/Main Street	2	5	5	12	-
Quintana Road/South Bay Boulevard	5	3	4	12	2
Quintana Road/Main Street	3	2	4	9	5
Highway 1/Yerba Buena Street	3	4	2	9	4
Highway 1/San Jacinto Street	1	5	2	8	9
Highway 1/Morro Bay Boulevard	3	3	2	8	-
Quintana Road/Morro Bay Boulevard	2	2	3	7	7
Main Street/Morro Bay Boulevard	2	3	2	7	-
Main Street/SR 41	2	4	1	7	-
Embarcadero/Embarcadero	2	3	2	7	-

1. Source: California Highway Patrol 2014; City of Morro Bay 1988
2. SWITRS does not provide a precise location for all collisions, so it is unclear where the collisions at the Highway 1 intersections with Main Stret and Morro Bay Boulevard occurred.

Five locations analyzed in the 1988 General Plan are also in the top 10 collision locations between 2012 and 2014. The number of reported collisions increased at three of these intersections, and stayed the same or decreased at two locations, despite traffic volume increases.

7. Parking

The City prepared a Parking Management Plan in 2007, which focused on parking conditions Downtown and along the Embarcadero. Nearly 2,500 parking spaces are located in this study area. Of these, more than 70 percent are managed by the City. Occupancy surveys were also conducted from noon to 6:00 PM on a Tuesday preceding Memorial Day and Saturday of Memorial Day weekend of that year.

The occupancy surveys showed that parking on the Embarcadero was fully utilized and several Downtown blocks were nearly fully utilized during the peak hour of the holiday weekend. The high parking occupancy rates were short in duration and supply was available within four blocks of all surveyed areas at all times, even during a holiday weekend.

The study developed an action plan to address the temporary supply issues present during busy weekends and more effectively manage the City's parking supply. The action plan includes the following recommendations:

1. Enhance the signage program to better direct drivers to the appropriate parking areas.
2. Improve public information related to parking for different users.
3. Encourage shared parking between different land uses.
4. Encourage employee parking policies to support parking availability for visitors.
5. Expand and enhance trolley service.
6. Regulate delivery truck parking.
7. Replace parallel parking with angled parking in selected areas.
8. Enhance pedestrian facilities with a focus on connections to parking and attractions.
9. Modify time limits to more effectively utilize the parking supply.

10. Encourage public-private partnerships to effectively provide parking.
11. Monitor and adjust the Parking In-Lieu Fee program.
12. Allow the provision of pervious parking surfaces to minimize stormwater runoff.

The City is implementing the action plan as opportunities arise. As recently as June 28, 2016, the Morro Bay City Council was considering approaches to prevent parking requirements from negatively impacting economic development.

Coastal Zone Access and parking

Public parking provides access to the Coastal Zone at numerous locations in Morro Bay. More than 2,200 free public parking spaces are provided by the City in the Coastal Zone. The primary public access points are described below and shown on Figure CIR-5.

- North Point Natural Area, located at the north end of Toro Lane, provides 10 marked vehicle parking spaces on the bluff connecting to stairways and trails to the beach. These parking spaces are occasionally fully utilized, but additional curbside parking is nearby in the Morro Strand campground area.
- Beachcomber Street provides approximately one-half mile of curbside parking (roughly 100 spaces) on the bluffs above the Morro Strand campground. These spaces are frequented by surfers and other beachgoers.
- The Morro Strand campground provides five marked parking spaces for day use in addition to the camp sites.
- Beachcomber Street offers curbside parking and two informal off-street parking areas south of Alva Paul Creek.
- An off-street parking lot at the end of Azure Street provides approximately 30 parking spaces as well as a restroom for beachgoers. This parking lot connects to the Cloisters trail network.
- The Cloisters Community Park offers 28 off-street parking spaces serving the park and multiuse trails providing beach access.
- Informal dirt parking lots and curbside parking are situated along the Embarcadero north of Morro Creek. A bicycle and pedestrian bridge crosses Morro Creek to connect with the Harborwalk path.
- A dirt parking lot is located at the end of the Embarcadero just south of Morro Creek. This lot also offers parking for bikes and surreys.
- Numerous parking areas are along Coleman Drive between the Embarcadero and Morro Rock. These provide access to the Harborwalk, basketball courts, small craft launch sites at Coleman Beach, Morro Rock, and other amenities in the area. Most of the parking areas consist of dirt lots. The lot closest to the harbor mouth is closed to vehicles during high surf for public safety.
- Parking supply and demand along the Embarcadero south to the launch ramp are discussed in detail in the 2007 Parking Management Plan.
- An informal dirt parking area accommodating approximately 12 vehicles is situated on Main Street north of the Museum of Natural History. This lot is regularly used as a launching point for small boats.
- A paved parking lot is located at the Morro Bay State Park Marina serving the general public and vessel owners. This lot also provides access to estuary walking trails.

Free parking is provided at all coastal access parking locations.

8. Walking

The City's well-established grid network, mild weather, and relatively flat topography support walking and biking. The Morro Bay Bicycle and Pedestrian Master Plan (2011) describes existing conditions and identifies goals, objectives, and planned improvements to serve these modes of travel. The American Community Survey estimates that in 2014, 4.5 percent of working-age residents in Morro Bay walked to work, 1.4 percent biked to work, and 72.8 percent drove alone to work.

Pedestrian facilities consist of sidewalks, Class I paths, and crosswalks. Sidewalks are provided along the Embarcadero and along most streets in the Downtown area. Most single-family residential areas in the City lack sidewalks. Section 12.04.010 of the Municipal Code requires that new developments conform to the City's Standard Drawings and Specifications (City of Morro Bay, 1987), which require sidewalks for commercial, industrial, and high-density residential uses as well as on arterial, local, and collector roads not bordered by one or more of these land uses. Hillside streets in R1/R2 zoning are required to provide a flat, walkable surface on one side of the road.

Crosswalks

There are four types of crosswalks in the City. Signalized crossings provide marked crosswalks and pedestrian signal heads. The three signalized intersections in the City provide signalized crossings on at least two legs of the intersection.

Controlled marked crossings provide striped crosswalks with a stop or yield sign on at least one leg of the intersection. There are 44 controlled marked crossings in the City, mostly in the Downtown area. There are two controlled marked crossings across Highway 1, one at San Jacinto Street and a second at Yerba Buena Street. A crosswalk, green bike lane striping, and Rectangular Rapid Flash Beacon were recently installed near the Atascadero Road/Highway 1 southbound ramp intersection. This area experiences high pedestrian volumes due to the proximity of the high school and nearby hotels.

Uncontrolled marked crossings provide striped crosswalks at mid-block and uncontrolled locations.

Unmarked crossings constitute the remainder of crosswalks wherever two public roads intersect, per the California Vehicle Code.

The Harborwalk provides a multi-use bicycle and walking path connecting the Embarcadero to Morro Rock. This path is heavily used by locals and visitors.

Trails

The California Coastal Trail is a hiking and bicycling trail that spans from Oregon to Mexico. The California legislature formally established the trail in 2001 and provided a general alignment. There is some existing signage for the Trail along the Bayfront of the Embarcadero. Additional recreational hiking trails are provided in Morro Bay State Park. These include the Black Hill hiking areas and walking paths along the estuary near the State Park marina.

Schools

Greenwood Avenue was identified prior to 2004 as the primary walking route to the City's only elementary school, Del Mar Elementary. No sidewalks are provided on Greenwood Avenue, causing pedestrians to walk in the roadway. In 2011 the City and stakeholders applied unsuccessfully for grant

funding for segment improvements through the Cycle 3 Federal Safe Routes to School Grants program. Funding for improvements to this segment has not yet been identified.

Morro Bay High School is connected to the Beach Tract by a Class I path. Many students walk through the Main Street/SR 41/Atascadero Road intersection, which is congested during peak hours. Recent pedestrian and bicycle improvements to the Highway 1 Southbound Ramps/Atascadero Road intersection have improved conditions for student cyclists and pedestrians.

9. Bicycling

Bicycle facilities are described in four classes of facilities:

- Class I bikeways provide a completely separate right-of-way for the exclusive use of bicycles and pedestrians with a minimum of vehicular cross-flow. The Harborwalk path is an example of a Class I facility. Approximately 3.6 miles of Class I facilities exist in the City.
- Class II bike lanes consist of a striped lane for one-way bicycle travel on a street or highway. Approximately 7.1 miles of Class II bike lanes exist in the City.
- Class III bike routes are shared by motorists and bicyclists. These routes are supplemented with signs and pavement legends including sharrows. The section of Beachcomber Street south of Yerba Buena Street is an example of a Class III bike route with sharrows.
- Class IV bike lanes, often called cycle tracks or protected bike lanes, are exclusive bike facilities physically separated from vehicles. Types of separation include grade separation, flexible posts, physical barriers, or on-street parking. No Class IV bike lanes currently exist in Morro Bay.

Figure CIR-1 shows existing and proposed bike facilities in Morro Bay. In addition to the California Coastal Trail discussed above, the California Pacific Bike Route connects Vancouver, British Columbia, to Imperial Beach, California, and follows Highway 1 through Morro Bay.

10. Regional Transit

The San Luis Obispo Regional Transit Authority (RTA) is a joint powers authority providing fixed-route regional service throughout the County and serving the Morro Bay Transit Center on Harbor Street. RTA provides ADA paratransit service through the Runabout, a demand response system operating within three-quarters of a mile of all fixed-route services in the County. Figure CIR-1 shows the RTA routes.

RTA Route 12 runs from Morro Bay to San Luis Obispo with stops in Los Osos, Cuesta College, and Cal Poly. It runs on one-hour headways on weekdays and two-hour headways on weekends.

RTA Route 15 runs from Morro Bay to San Simeon with stops in Cayucos and Cambria. It operates on two- to three-hour headways on weekdays and Saturdays and four-hour headways on Sundays.

RTA ridership has consistently increased each year since 2007. Additionally, 2013 ridership is 270 percent greater than 2003 ridership.

11. Local Transit

The City operates Morro Bay Transit, which provides fixed-route service with hourly headways from 6:25 a.m. to 6:45 p.m. on weekdays and 8:25 a.m. to 4:25 p.m. on Saturdays. Curb-to-curb service is provided within three-quarters of a mile of the fixed route on a reservation basis. This route serves the

City's major campgrounds, high school, senior center, grocery store, and neighborhoods throughout the City. Figure CIR-1 shows the Morro Bay Transit routes.

The Morro Bay Trolley operates three loops from Memorial Day weekend through the first weekend in October. The routes serve north Morro Bay, Downtown, and the waterfront with headways under one hour. Stops are provided at the State Park campground, Downtown, the Embarcadero, Morro Rock, and Morro Strand campground.

Morro Bay Transit's 2013 triennial performance audit provided four recommendations:

1. Establish performance standards for all services to better track performance trends.
2. Construct a full ridership profile based on the North County Transit Surveys and additional customer feedback. This information should be used to tailor marketing and public outreach activities.
3. Consider implementing targeted public information campaigns about services to increase ridership among key populations.
4. Make it easier for riders to submit feedback about transit services.

In response to the first recommendation, the City established performance standards regarding passengers per vehicle service hour and incentivized these goals in its service contract. To the second recommendation, the City solicited feedback through both print and electronic methods in addition to conducting on-board opinion surveys and boarding/alighting counts. The City acted on the third recommendation by publicizing unmet transit needs hearings, advertising in local newspapers, visiting senior centers, using targeted marketing to tourists, and identifying a small commuter market. The City implemented the fourth recommendation by offering several methods to receive customer feedback, including an online customer feedback link and a comment form printed in the Morro Bay Transit brochure.

Morro Bay Transit Fixed Route and Call-A-Ride service saw ridership increase by about 30 percent from fiscal years 2012 to 2015. However, over the same period, Morro Bay Trolley ridership decreased by about 15 percent.

The Morro Bay Senior Citizens, Inc. operates a senior transportation shuttle on Monday through Thursday from 9:00 a.m. to 4:00 p.m. It serves destinations throughout the County.

Buildout Transportation Conditions

This section describes transportation conditions under Buildout and Buildout Plus Project conditions. Buildout conditions refer to anticipated buildout under the current General Plan. Buildout Plus Project conditions reflect conditions with the updated General Plan land uses in place.

TRAVEL FORECASTS

The SLOCOG Travel Demand Model was applied to develop future year traffic forecasts. The SLOCOG Model estimates traffic using employees for most commercial uses. Because most land use planning uses building square footage instead of employees it was necessary to convert the planned commercial square footage to an equivalent number of employees using conversion factors. The conversion factors were developed using an inventory of existing uses and existing employees using land use data provided by SLOCOG.

The Buildout Plus Project scenario includes land use changes in a number of areas of the City, with the most prominent changes planned at the power plant site, the current wastewater treatment facility, and areas adjacent to SR 41 east of Highway 1. The zoning changes on these three sites could substantially increase the traffic generated in these areas. The precise level of traffic generation will depend on the intensity and mix of land uses. Because this information is not known at this time, these parcels were assumed to develop to 80 percent of their maximum allowed intensity using the generic zoning categories. Even with these reductions, the large growth in visitor serving commercial uses would result in major shifts in regional travel patterns. The Master Plan areas will require a more detailed analysis to determine off-site transportation impacts, connections, and mitigations.

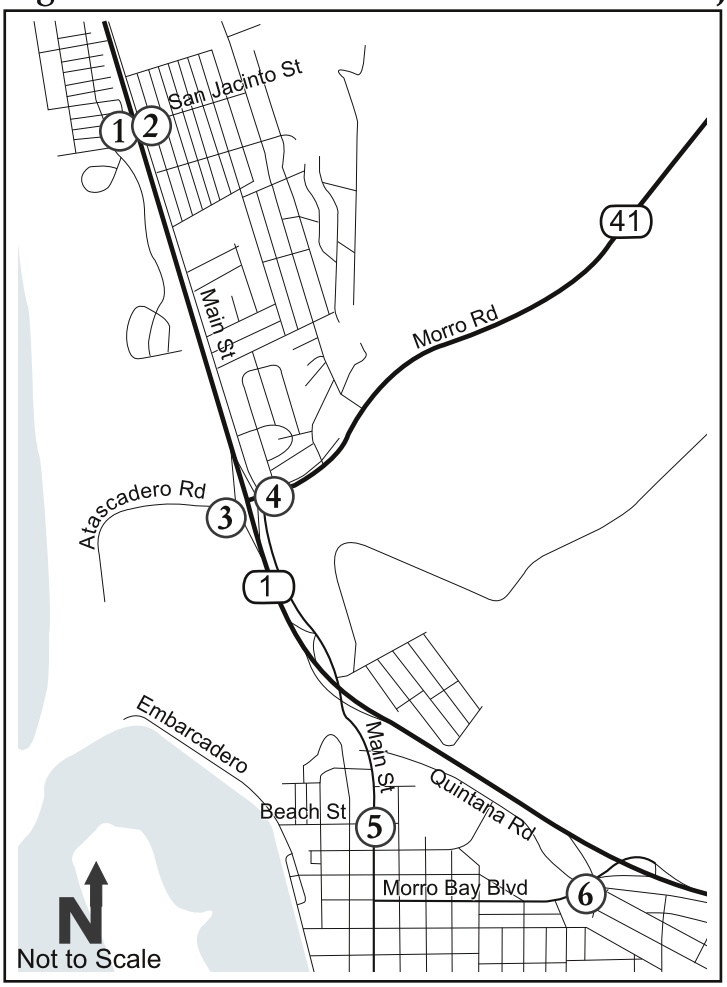
The SLOCOG link-level model outputs were extracted for the study locations and used to develop turning movement forecasts using the difference method, where the buildout model's growth over the base year is added to the base year's traffic counts. The raw forecasts were then reviewed for reasonableness and adjusted where needed to ensure conservation of flow between closely spaced intersections.

ROADWAY NETWORK IMPROVEMENTS

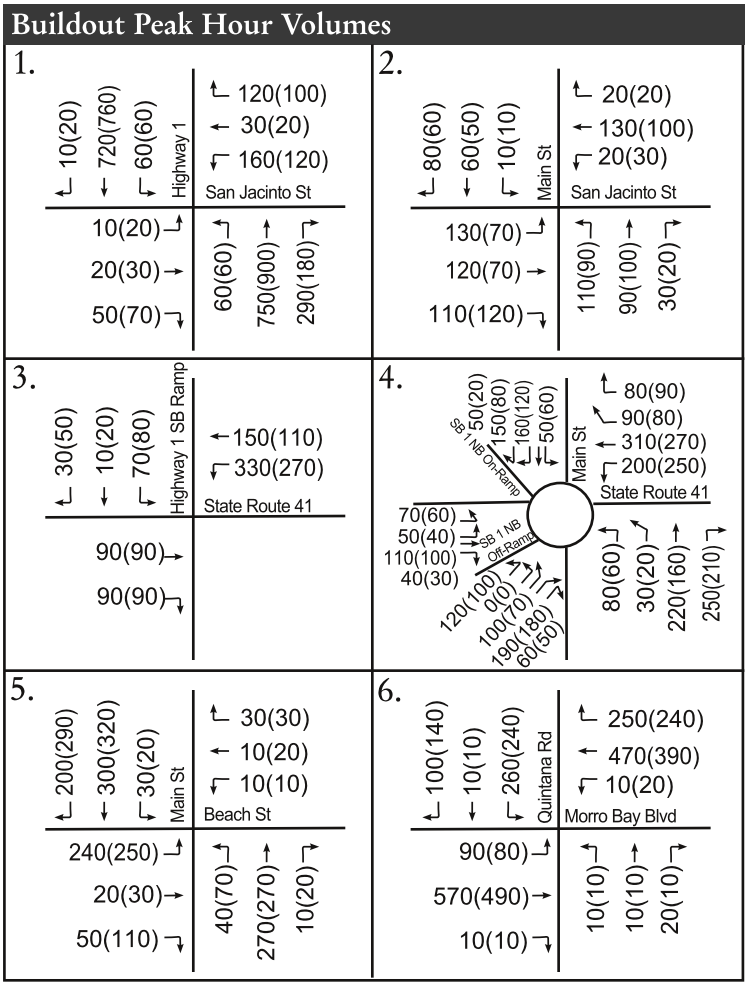
The SR 41/Main Street intersection was assumed to provide a roundabout incorporating the northbound Highway 1 on- and off-ramps consistent with the configuration described in the *State Route 1/State Route 41/Main Street Intersection Control Evaluation Step 2 Report* (Omni-Means, May 2016). This intersection was evaluated using the Sidra software package due to the six-leg configuration. The remaining intersection lane configurations and traffic control types were assumed to remain the same under Buildout conditions as Existing conditions.

Figure 2 shows the Buildout and Buildout Plus Project traffic volumes.

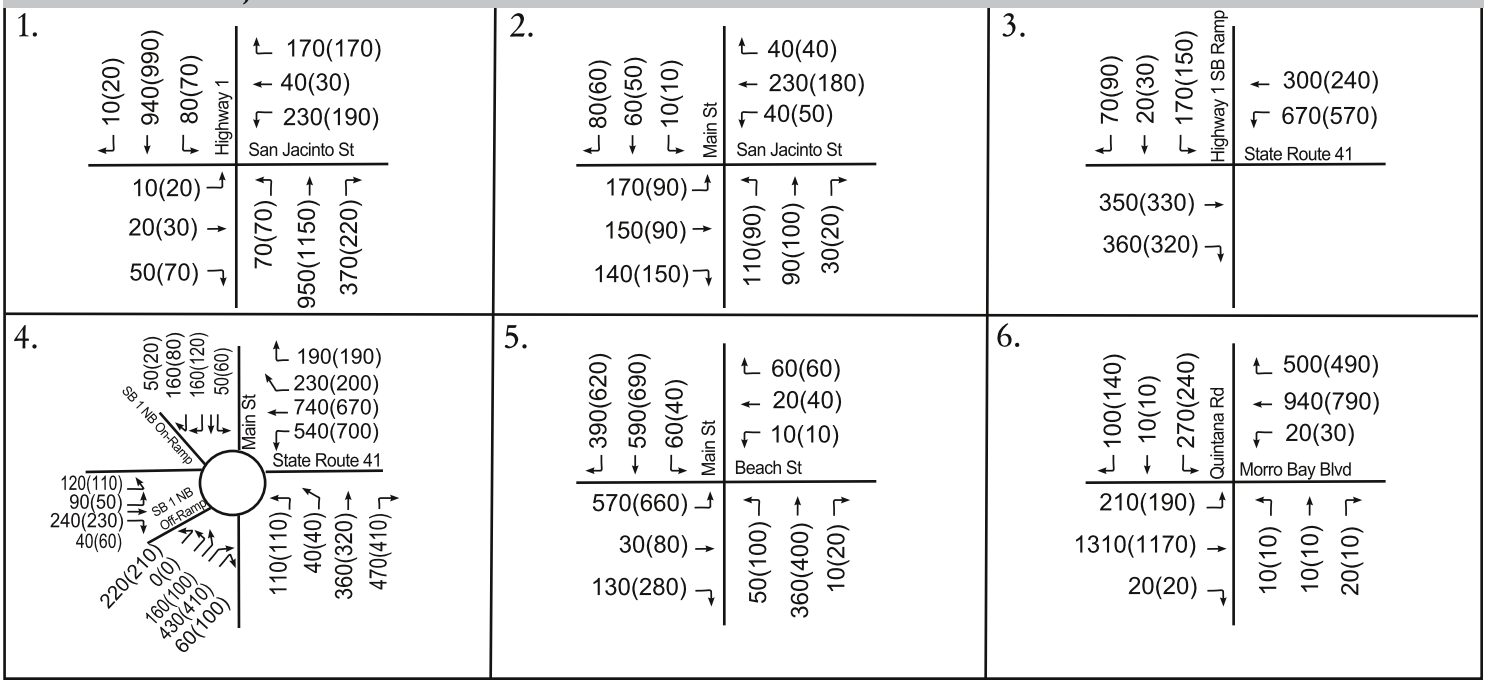
Figure 2: Buildout and Buildout Plus Project Volumes



Buildout Peak Hour Volumes



Buildout Plus Project Peak Hour Volumes



Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Legend:

xx(yy) - PM(Sat Mid) Peak Hour Traffic Volumes

(x) - Study Intersection

BUILDOUT CONDITIONS

This section describes 1) intersection operations, 2) segment operations, and 3) VMT under Buildout and Buildout Plus Project conditions.

1. Intersection Operations

Figure 2 shows the Buildout and Buildout Plus Project peak hour traffic volumes. Table 8 shows the LOS for the study intersections under Buildout and Buildout Plus Project conditions, with detailed calculation sheets included in Appendix C.

Table 8: Buildout and Buildout Plus Project Intersection Auto Levels of Service

		Buildout			Buildout + Project			
Intersection	Peak Hour	V/C[1]	Delay[2] (sec/veh)	LOS[3]	V/C[1]	V/C Delta	Delay[2] (sec/veh)	LOS[3]
1. San Jacinto Street/ Highway 1	Week PM	0.65	23.9	C	0.77	0.12	29.3	C
	Sat MID	0.65	22.8	C	0.78	0.13	27.5	C
2. San Jacinto Street/ Main Street[3]	Week PM	-	10.8 (21.9)	C	-	-	**51.8 (152.5)**	**F**
	Sat MID	-	8.5 (15.6)	B	-	-	**70.0 (186.5)**	**F**
3. State Route 41/ Highway 1 SB Ramps[3]	Week PM	**0.47**	**8.2 (31.8)**	**- (D)**	**>1.0**	**-**	**- (>200)**	**F**
	Sat MID	0.40	7.6 (21.1)	- (C)	**>1.0**	**-**	**>200 (>200)**	**F**
4. State Route 41/ Main Street	Week PM	0.93	18.9	B	**2.91**	**1.98**	**>200**	**F**
	Sat MID	0.64	10.7	B	**4.45**	**3.81**	**>200**	**F**
5. Beach Street/ Main Street	Week PM	0.63	17.8	C	**1.72**	**1.09**	**173.8**	**F**
	Sat MID	**0.81**	**27.0**	**D**	**2.22**	**1.41**	**>200**	**F**
6. Morro Bay Boulevard/ Quintana Road	Week PM	0.86	17.8	C	**2.02**	**1.16**	**>200**	**F**
	Sat MID	0.74	13.4	B	**1.77**	**1.03**	**184.0**	**F**

1. Volume to capacity ratio reported for worst movement.
2. HCM 2010 average control delay in seconds per vehicle for SSSC, AWSC and Intersection #6 roundabout. HCM 2000 average control delay for signalized intersecctions. Sidra Analysis control delay for Intersection #4
3. For side-street-stop controlled intersections the worst approach's delay is reported in parenthesis next to the overall intersection delay. Unacceptable operations shown in bold text.

The following intersections operate below the LOS D threshold for vehicles:

- San Jacinto Street/Main Street (#2) operates at LOS F during the weekday PM and Saturday midday peak hours under Buildout Plus Project conditions.
- State Route 41/Highway 1 SB Ramps (#3) operates at LOS F on the southbound approach during the weekday PM and Saturday midday peak hours under Buildout Plus Project conditions.
- State Route 41/Main Street (#4) operates at LOS F during the weekday PM and Saturday midday peak hours under Buildout Plus Project conditions. Note that this reflects operations with the planned roundabout in place.
- Beach Street/Main Street (#5) operates at LOS F during the weekday PM and Saturday midday peak hours under Buildout Plus Project conditions.

- Morro Bay Boulevard/Quintana Road (#6) operates at LOS F during the weekday PM and Saturday midday peak hours under Buildout Plus Project conditions.

Intersection Recommendations

The addition of project traffic results in unacceptable traffic operations at five of the six study intersections during both of the analysis time periods. This is due in part to the assumption that undeveloped parcels in the City will develop to near the maximum allowed extent, when in practice many properties never develop and others develop less intensely than allowed by zoning regulations. These assumptions result in roughly doubling the total amount of non-residential square footage within the City, with much of the growth occurring near the waterfront. This level of growth would require substantial increases in the capacity of serving roadways and would likely impact intersections beyond those studied herein.

Master Plans will be required for the larger redevelopment areas that include the current wastewater treatment plant and power plant. These Master Plans will require detailed traffic studies to identify off-site impacts to transportation facilities (including Highway 1 and interchanges), the need for additional roadway connections, and other improvements. The scope of these studies will depend on the intensity of uses proposed for the sites.

The preliminary mitigations below list the needed improvements to improve service levels under Buildout Plus Project conditions. Signal warrant analysis sheets, if applicable, are included in Appendix E. None of these improvements are currently funded or included in any planning documents. They should be re-evaluated when specific land uses are proposed for the large development sites in the City.

- San Jacinto Street/Main Street (#2): It would be necessary to reconstruct this intersection and provide a roundabout or traffic signal to achieve acceptable operations.
- State Route 41/Highway 1 SB Ramps (#3): Acceptable operations could be provided by constructing a traffic signal, which is warranted. The signalized intersection would require expanding the westbound approach to include one left turn lane and a shared through-left lane; adding an eastbound right turn lane; and adding a second receiving lane on the south leg. Alternatively, a single-lane roundabout with bypass lanes could provide acceptable operations under Buildout Plus Project conditions.
- State Route 41/Main Street (#4): It would be necessary to expand the planned roundabout with additional entry and circulating lanes to provide acceptable operations under Buildout Plus Project conditions.
- Beach Street/Main Street (#5): A new vehicular connection from the power plant to Main Street near Highway 1 and across Morro Creek to Atascadero Road would reduce traffic levels at this intersection. Acceptable operations could also be provided by constructing a traffic signal, which is warranted. The signalized intersection would require expanding the southbound approach to include one left turn lane, one through lane, and one right turn lane; modifying the eastbound approach to include one left turn lane and a shared left-through-right lane; and adding a second receiving lane on the north leg. Alternatively, a single-lane roundabout with bypass lanes could provide acceptable operations under Buildout Plus Project conditions.

- Morro Bay Boulevard/Quintana Road (#6): It would be necessary to expand the roundabout with additional entry and circulating lanes to provide acceptable operations under Buildout Plus Project conditions.

The Master Plans should evaluate the need and benefit of providing a vehicular connection across Morro Creek, connecting the power plant site directly to Main Street, and impacts of redevelopment on the SR 41 and Main Street interchanges as well as Highway 1 and SR 41.

2. Segment Operations

Table 9 shows the segment operations during the weekday PM and Saturday MID peak hours under Buildout and Buildout Plus Project conditions.

The following deficiencies are reported:

Pedestrian:

- #1a Embarcadero North of Beach Street operates at LOS F in the northbound direction both with and without the project due to the lack of sidewalks, and at LOS E in the southbound direction with the project on Saturday midday due to high adjacent vehicle volumes.
- #2 Morro Bay Boulevard west of Quintana Road operates at LOS E in the eastbound direction under Buildout Plus Project conditions due to high vehicular volumes.
- #3 Main Street south of Radcliff Drive operates at LOS E or F under Buildout Plus Project conditions due to high vehicle volumes adjacent to the sidewalk and the missing sidewalk for southbound pedestrians under the Highway 1 overcrossing.
- #4 SR 41 east of Main Street operates at LOS F under Buildout and Buildout Plus Project conditions due to high vehicle volumes and speeds and a lack of sidewalks.

Bicycle: There are no deficiencies reported on the bicycle segments with and without the project.

Auto: There are no deficiencies reported on the auto segments with and without the project.

Note that intersections are typically the constraint points for vehicular capacity, not segments. Refer to the preceding Intersection Operations section for vehicular recommendations.

Table 9: Buildout and Buildout Plus Project Segment Pedestrian & Bicycle Levels of Service																	
			Pedestrian				Bicycle				Vehicle						
			Buildout		Buildout + Project		Buildout		Buildout + Project		Buildout			Buildout + Project			
Segment	Peak Hour	Direction	LOS Score[1]	LOS[1]	LOS Score[1]	LOS[1]	LOS Score[1]	LOS[1]	LOS Score[1]	LOS[1]	V/C Ratio	LOS Score[1]	LOS[1]	V/C Ratio	LOS Score[1]	LOS[1]
1a. Embarcadero - North of Beach Street	Week PM	NB	**2.06**	**F**	**3.27**	**F**	2.69	B	3.35	C	0.09	3.28	C	0.34	3.28	C
		SB	1.44	A	3.40	C	2.69	B	3.53	D	0.09	3.02	C	0.47	3.02	C
	Sat MID	NB	**2.41**	**F**	**4.55**	**F**	2.98	C	3.64	D	0.17	3.28	C	0.61	3.28	C
		SB	1.67	A	**4.60**	**E**	2.89	C	3.74	D	0.13	3.02	C	0.70	3.02	C
1b. Embarcadero - North of Pacific Street	Week PM	NB	1.27	A	1.64	A	2.68	B	3.53	D	0.05	3.72	D	0.11	3.72	D
		SB	1.14	A	1.74	A	2.68	B	3.73	D	0.05	3.72	D	0.17	3.72	D
	Sat MID	NB	1.39	A	1.83	A	3.04	C	3.69	D	0.07	3.72	D	0.15	3.72	D
		SB	1.41	A	2.34	B	3.43	C	4.03	D	0.09	3.72	D	0.30	3.72	D
1c. Embarcadero - South of Pacific Street	Week PM	NB	1.17	A	1.40	A	2.68	B	3.38	C	0.05	3.28	C	0.08	3.28	C
		SB	1.12	A	1.56	A	2.68	B	3.60	D	0.05	3.28	C	0.13	3.28	C
	Sat MID	NB	1.23	A	1.47	A	2.87	C	3.47	C	0.06	3.28	C	0.10	3.28	C
		SB	1.27	A	1.84	A	3.12	C	3.80	D	0.07	3.28	C	0.19	3.28	C
2. Morro Bay Boulevard - West of Quintana Road	Week PM	EB	2.60	B	**4.59**	**E**	2.53	B	2.99	C	0.29	3.62	D	0.73	3.62	D
		WB	2.72	B	3.55	D	2.57	B	2.80	C	0.32	3.62	D	0.50	3.62	D
	Sat MID	EB	2.48	B	**4.29**	**E**	2.48	B	2.94	C	0.26	3.62	D	0.65	3.62	D
		WB	2.65	B	3.44	C	2.54	B	2.77	C	0.30	3.62	D	0.47	3.62	D
3. Main Street - South of Radcliff Drive	Week PM	NB	2.47	B	**4.43**	**E**	2.28	B	2.96	C	0.14	3.28	C	0.56	3.28	C
		SB	**3.80**	**F**	**5.00**	**F**	2.49	B	2.88	C	0.22	3.02	C	0.47	3.02	C
	Sat MID	NB	2.90	C	**6.09**	**F**	2.52	B	3.21	C	0.22	3.28	C	0.86	3.28	C
		SB	**3.95**	**F**	**5.31**	**F**	2.56	B	2.94	C	0.24	3.02	C	0.51	3.02	C
4. State Route 41 - East of Main Street	Week PM	EB	**3.45**	**F**	**5.43**	**F**	0.77	A	1.29	A	0.24	3.16	C	0.66	3.16	C
		WB	**3.91**	**F**	**6.12**	**F**	0.95	A	1.39	A	0.34	3.16	C	0.80	3.16	C
	Sat MID	EB	**3.37**	**F**	**5.20**	**F**	0.74	A	1.25	A	0.22	3.16	C	0.60	3.16	C
		WB	**4.30**	**F**	**7.04**	**F**	1.06	A	1.50	A	0.41	3.16	C	0.97	3.16	C

1. HCM 2010 pedestrian/bicycle score and LOS

2. Main Street - S of Radcliff Drive SB and State Route 41 - E of Main Street WB have high Freeflow Speeds and no sidewalks; likely causes of their poor Pedestrian LOS.

Recommendations

Pedestrian:

- #1a Embarcadero North of Beach Street: provide sidewalks and a vehicular connection shifting traffic away from Beach Street for the redeveloped power plant site.
- #2 Morro Bay Boulevard: provide a landscaped buffer at least two feet wide between the sidewalk and travel lanes.
- #3 Main Street south of Radcliff Drive: continuous sidewalks would be necessary to provide acceptable pedestrian operations. This is infeasible with the current overpass width but should be accommodated if the overpass is reconstructed.
- #4 SR 41 east of Main Street: provide sidewalks with a landscaped buffer when adjacent properties are redeveloped.

3. VMT

Table 10 shows the VMT under Buildout and Buildout Plus Project conditions. The substantial land use growth evaluated under Buildout Plus Project conditions results in a major increase in VMT.

Table 10: VMT in Morro Bay (Buildout and Buildout Plus Project)			
Trip Type	**Daily VMT in SOI**	**Daily VMT in County**	**Daily VMT in State**
Origin and destination within City SOI	63,301 (123,487)	63,301 (123,487)	63,301 (123,487)
Origin only within City SOI	18,268 (82,925)	53,405 (720,021)	71,734 (1,118,440)
Destination only within City SOI	18,535 (91,287)	58,616 (782,939)	76,945 (1,181,359)
Total	100,104 (297,699)	175,322 (1,626,447)	211,981 (2,423,286)
KEY: xx (yy) = Buildout (Buildout Plus Project) VMT 1. SOI = Sphere of Influence 2. Source: SLOCOG and CA Statewide Travel Demand Models			

The increased VMT is attributable to the large increase in employment associated with significant commercial growth. Table 11 summarizes the ratio of jobs to households in Morro Bay and the County under Existing, Buildout, and Buildout Plus Project conditions using data extracted from the SLOCOG Travel Demand Model. The Buildout Plus Project scenario significantly increases the number of jobs in Morro Bay but does not provide a commensurate increase in households, which results in substantial new trips shifted to Morro Bay from other areas. This increase would be significant enough to modify regional travel patterns.

Table 11: Jobs:Household Comparisons			
	Existing	**Buildout No Project**	**Buildout Plus Project**
Morro Bay Jobs/HH	0.66	0.72	2.77
SLO County Jobs/HH	0.93	0.97	1.07
Source: SLOCOG Travel Demand Model, CCTC 2018			

References

City of Morro Bay. 1984. Circulation Element of the General Plan.

Institute of Transportation Engineers (ITE). 2012. Trip Generation, 9th Edition.

_____. 2014. Trip Generation Handbook.

Omni-Means. 2016. State Route 1/State Route 41/Main Street Intersection Control Evaluation (Step 2) Report.

San Luis Obispo Council of Governments. 2014. Regional Transportation Plan/Sustainable Communities Strategy.

Transportation Research Board. 2010 Highway Capacity Manual.

_____. 2016. Highway Capacity Manual, 6th Edition.

Appendix F

Energy Data

City of Morro Bay General Plan/LCP Update

Last Updated: April 13, 2020

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Rubber Tired Dozer	1	8	247	0.40	Demo	835.59
Tractors/Loaders/Backhoes	1	8	97	0.37	Demo	337.45
XXX	0	8	20	0.30	Demo	-
Concrete/Industrial Saws	1	8	81	0.73	Site Prep	83.39
Excavators	1	8	18	0.38	Site Prep	9.65
Rubber Tired Dozer	1	8	247	0.40	Site Prep	125.34
XXX	0	8	20	0.30	Site Prep	-
Graders	1	8	187	0.41	Grading	194.53
Excavators	1	8	158	0.38	Grading	152.34
Rubber Tired Dozer	1	8	247	0.40	Grading	250.68
Tractors/Loaders/Backhoes	1	8	97	0.37	Grading	101.23
XXX	0	8	20	0.30	Grading	-
Cranes	1	8	231	0.29	Building	6,232.20
Forklifts	1	8	89	0.20	Building	1,840.97
Generator Sets	1	8	84	0.74	Building	6,428.90
Tractors/Loaders/Backhoes	1	8	97	0.37	Building	3,711.92
Welders	1	8	46	0.45	Building	2,140.90
XXX	0	8	20	0.30	Building	-
Air Compressors	1	8	78	0.48	Arch Coating	176.01
XXX	0	8	20	0.30	Arch Coating	-
Pavers	1	8	130	0.42	Paving	2,978.46
Paving Equipment	1	8	132	0.36	Paving	2,592.24
Rollers	1	8	80	0.38	Paving	1,843.60
XXX	0	8	20	0.30	Paving	-
					Total Fuel Used	**30,035.39**
						(Gallons)

Construction Phase	Days of Operation
Demolition Phase	20
Site Preparation Phase	3
Grading Phase	6
Building Construction Phase	220
Paving Phase	10
Architectural Coating Phase	129
Total Days	388

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	18	14.7	220.50
Site Prep Phase	24.0	18	14.7	33.08
Grading Phase	24.0	15	14.7	55.13
Building Phase	24.0	756	14.7	101871.00
Paving Phase	24.0	15	14.7	91.88
Architectural Coating Phase	24.0	151	14.7	11930.89
			Total	**114,202.46**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition	7.4	18	14.7	35.76
Site Prep Phase	7.4	18	14.7	35.76
Grading Phase	7.4	15	14.7	29.80
Building Phase	7.4	756	14.7	1501.78
Paving Phase	7.4	15	14.7	29.80
Architectural Coating Phase	7.4	151	14.7	299.96
			Total	**1,932.85**
VENDOR TRIPS				
Demolition	7.4	18	14.7	715.14
Site Prep Phase	7.4	18	14.7	107.27
Grading Phase	7.4	15	14.7	178.78
Building Phase	7.4	756	14.7	330392.43
Paving Phase	7.4	15	14.7	297.97
Architectural Coating Phase	7.4	151	14.7	38694.77
			Total	**8.00**

Total Gasoline Consumption (gallons)	**114,202.46**
Total Diesel Consumption (gallons)	**31,976.25**

Sources:

[1] United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b* . July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2018. *National Transportation Statistics 2018* . Available at: https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsentire2018q4.pdf.

City of Morro Bay General Plan/LCP Update

Last Updated: April 13, 2020

Populate one of the following tables (Leave the other blank):

Annual VMT	
Annual VMT:	122,553,269
Daily VMT	335,762

Fleet Class	Fleet Mix		Fuel Economy (MPG) [1]
Light Duty Auto (LDA)	0.617814	LDA	44.39
Light Duty Truck 1 (LDT1)	0.024228	LDT1	41.58
Light Duty Truck 2 (LDT2)	0.201503	LDT2	34.65
Medium Duty Vehicle (MDV)	0.100888	MDV	25.95
Light Heavy Duty 1 (LHD1)	0.010115	LHD1	19.01
Light Heavy Duty 2 (LHD2)	0.003910	LHD2	17.32
Medium Heavy Duty (MHD)	0.012592	T6 Public	8.40
Heavy Heavy Duty (HHD)	0.020425	T7 Public	5.63
Other Bus (OBUS)	0.002295	OBUS	6.75
Urban Bus (UBUS)	0.001008	UBUS	4.69
School Bus (SBUS)	0.000680	SBUS	7.55
Motorhome (MH)	0.000535	MH	9.89
Motorcycle (MCY)	0.004008	MCY	36.85

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Light Duty Auto (LDA)		*Gasoline*	75,715,125.33		1,705,870.21
Light Duty Truck 1 (LDT1)		*Gasoline*	2,969,220.60		71407.50814
Light Duty Truck 2 (LDT2)		*Gasoline*	24,694,851.36		712599.7816
Medium Duty Vehicle (MDV)		*Gasoline*	12,364,154.20		476516.9534
Light Heavy Duty 1 (LHD1)		*Diesel*	1,239,626.32		65223.89726
Light Heavy Duty 2 (LHD2)		*Diesel*	479,183.28		27661.86798
Medium Heavy Duty (MHD)		*Diesel*	1,543,190.76		183707.0797
Heavy Heavy Duty (HHD)		*Diesel*	2,503,150.52		444373.3775
Other Bus (OBUS)		*Diesel*	281,259.75		41691.31962
Urban Bus (UBUS)		*Diesel*	123,533.70		26356.82817
School Bus (SBUS)		*Diesel*	83,336.22		11041.15335
Motorhome (MH)		*Diesel*	65,566.00		6628.874284
Motorcycle (MCY)		*Gasoline*	491,193.50		13330.18471

Total Gasoline Consumption (gallons)	**2,979,724.64**	3,786,409.03			
Total Diesel Consumption (gallons)	**806,684.40**				
VMT/gallon (gasoline)	**39.01**	**gallon/VMT (gasoline)**	**0.03**	**BTU/VMT (gasoline)**	**3,267.49**
VMT/gallon (diesel)	**7.83**	**gallon/VMT (diesel)**	**0.13**	**BTU/VMT (diesel)**	**14,015.66**

Sources:

[1] California Air Resources Board (CARB). 2015. "EMFAC2014 Web Database." December 14, 2015. https://www.arb.ca.gov/emfac/2014/ (accessed March 15, 2019).

Appendix G

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program

This document is the Mitigation Monitoring and Reporting Program (MMRP) for the Morro Bay General Plan and Local Coastal Plan Update, SCH#2017111026, proposed in the City of Morro Bay, California. Public Resources Code Section 21081.6(a)(1) requires that a Lead Agency adopt an MMRP before approving a project to mitigate or avoid significant impacts that have been identified in an Environmental Impact Report (EIR). The purpose of the MMRP is to ensure that the required mitigation measures identified in the EIR are implemented as part of the overall project development process. In addition to ensuring implementation of mitigation measures, the MMRP provides guidance to agency staff and decision-makers during project implementation and identifies the need for enforcement action before irreversible environmental damage occurs. The MMRP must be adopted when the City Council makes a final decision on the project.

The following table summarizes the mitigation measures identified in the Final EIR for the proposed project. Specifically, the table identifies each mitigation measure; the action required for the measure to be implemented; the time at which the monitoring is to occur; the monitoring conditions; and the agency or party responsible for ensuring that the monitoring is performed. Once completed, all monitoring actions will be reported in writing to or by the City, which will maintain mitigation monitoring records for the proposed project.

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
AQ-2. Standard Mitigation for Construction Equipment. Proponents of individual land use projects, or other projects requiring grading or building permits, shall require construction contractors to incorporate the following standard mitigation measures, as applicable, to reduce ROG, NO_X, and DPM emissions from construction equipment. Mitigation measures shall be listed on project construction plans and the project proponent shall perform periodic site inspections during construction to ensure that mitigation measures are being implemented. ▪ Maintain all construction equipment in proper condition according to manufacturer's specifications ▪ Fuel all off-road and portable diesel-powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road) ▪ Use diesel construction equipment meeting ARB's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines, and comply with the State Off-Road Regulation ▪ Use on-road heavy-duty trucks that meet ARB's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation ▪ Construction or trucking companies with fleets that that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g., captive or NO_X exempt area fleets) may be eligible by proving alternative compliance ▪ All on and off-road diesel equipment shall not idle for more than 5 minutes. Signs shall be posted in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit ▪ Diesel idling within 1,000 feet of sensitive receptors is not permitted ▪ Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors ▪ Electrify equipment when feasible	Verify all SLOAPCD Standard Mitigation for Construction Equipment or the equivalent are implemented for all projects as applicable.	During project construction	Continuously during project construction	City of Morro Bay Community Development Department			

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▪ Substitute gasoline-powered in place of diesel-powered equipment, where feasible Use alternatively fueled construction equipment on-site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel.							
BIO-1(a) Avoidance and Minimization during Development. Policy C-1.3 shall be updated to read: **Policy C-1.3.** Biological Site Assessments. A biological assessment shall be required for any development proposed on sites that include or are within 100 feet of mapped ESHA in Figure C-2, and all other sites with natural vegetation regardless of whether ESHA has been mapped in Figure C-2, and for all other projects for which evidence indicates that ESHA may be present either on or adjacent to the site. The best available information about the location of ESHA in the City shall be used. Such assessment shall be prepared at the owner's expense by a qualified biologist approved by the City and shall, at minimum: a. Identify and confirm the extent of the ESHA, b. Document any site constraints and the presence of sensitive plant or animal species, c. Recommend buffers and development setbacks and standards to protect the ESHA, d. ~~Recommend mitigation measures to address any allowable impacts~~ If listed species, other special status species, or nesting birds are present or have potential to occur, specify avoidance and minimization measures, including compensatory mitigation, to be implemented to avoid or minimize take of individuals and loss of occupied habitat, and specify the necessary consultation pathway(s) with USFWS, NMFS, and/or CDFW to obtain incidental take coverage, where necessary, and e. Include any other information and analyses necessary to understand potential ESHA impacts as well as measures necessary to protect the resource as required by the Local Coastal Program.	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			

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If the site contains the potential for monarch overwintering or rookeries due to the presence of appropriately sized trees and groves, a seasonally timed survey appropriate for detecting the target species must also be included in the study.							
BIO-1(b) External Impacts. Policy OS-7 shall be updated to read: **Policy OS-7.1.** Account for External Impacts. If any portion of the area outside the city limits is included in the City's sphere of influence in the future, prepare and adopt a plan for the affected parcels that includes infrastructure and services provided by the City of Morro Bay. The plan shall also identify policies for the protection of natural resources in the affected areas.	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			
BIO-3. Wildlife Movement Corridors Protection. The following policy shall be added to the Conservation Element. **Policy C-1.17.** Project Design for Wildlife Connectivity. Design new stream crossing structures and extensions or modifications of existing structures to accommodate wildlife movement. At a minimum, structures within steelhead streams must be designed in consultation with a fisheries biologist and shall not impede movement. New projects with long segments of fencing and lighting shall be designed to minimize impacts to wildlife. Fencing or other project components shall not block wildlife movement through riparian or other natural habitat. Where fencing or other project components that may disrupt wildlife movement is required for public safety concerns, they shall be designed to permit wildlife movement. This policy shall be supported by adding the following implementation action to Goal-1 of the Conservation Element: Wildlife movement features shall be included when designing new or modified stream crossing structures to allow wildlife movement including for aquatic and terrestrial species. Fencing or other components shall be designed to allow movement.	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			

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CR-1(a). Avoidance or Minimization of Historic, Cultural, and Archaeological Resources Impacts. Policy C-2.3 of the General Plan and LCP Update shall be revised to read: **Policy C-2.3.** Protection of Cultural Resources. Ensure the protection of historic, cultural, and archeological resources during development, construction, and other similar activities. Development shall avoid, to the maximum extent feasible, adversely impacting historic, cultural, and/or archaeological resources, and shall include adequate BMPs to address any such resources that may be identified during construction, including avoidance, minimization, and mitigation measures sufficient to allow documentation, preservation, and other forms of mitigation. If the resource(s) in question are of Native American origin, develop avoidance or minimization measures in consultation with appropriate Native American tribe(s).	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			
CR-1(b). Cultural Resources Study Implementation Action. The following implementation action for Goal C-2 shall be added to the General Plan and LCP Update: Require all discretionary proposals within the cultural resources overlay to consider the potential to disturb cultural resources. If preliminary reconnaissance suggests that cultural resources may exist, a Phase I cultural resources study shall be performed by a qualified professional meeting the Secretary of the Interior's (SOI) Professional Qualification Standard (PQS) for archaeology and/or architectural history, as appropriate (NPS 1983). A Phase I cultural resources study shall include a pedestrian survey of the project site and sufficient background research and field sampling to determine whether subsurface prehistoric or historic remains may be present. Archival research should include a records search at the Central Coast Information Center (CCIC) and a Sacred Lands File (SLF) search with the Native American Heritage Commission (NAHC). Where identified or potential resources are of Native American origin, the appropriate Native American tribe(s) will participate with the qualified professional. The	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			

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technical report documenting the study shall include recommendations to avoid or, if avoidance is not feasible, reduce impacts to cultural resources.							
N-2. Construction Vibration Control Measures and Notification. The following new policies shall be added to the Noise Element under Goal NOI-3: **Policy NOI-3.5.** Vibration Control. Control construction vibration by avoiding the use of vibratory rollers near vibration-sensitive receptors and scheduling construction activities with the highest potential to produce vibration to hours with the least potential to affect sensitive land uses. **Policy NOI-3.6.** Construction Vibration Notification. Developers shall notify neighbors of scheduled construction activities that would generate vibration.	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			
T-1. Pedestrian Facility Improvements. The following pedestrian facility improvements shall be added to the list of "Planned Circulation Improvements" in the General Plan and LCP Update Circulation Element. ▪ Embarcadero North of Beach Street: Provide sidewalks and a vehicular connection shifting traffic away from Beach Street for the redeveloped Morro Bay Power Plant site. ▪ Morro Bay Boulevard: Provide a landscaped buffer at least two feet wide between the sidewalk and travel lanes. ▪ Main Street south of Radcliffe Drive: Provide continuous sidewalks to provide acceptable pedestrian operations. ▪ SR 41 east of Main Street: Provide sidewalks with a landscaped buffer when adjacent properties are redeveloped. In addition, Policy CIR-1.8 shall be revised as follows: **Policy CIR-1.8.** Capital Improvement Program. Use the City's Capital Improvement Program (CIP) process to prioritize, fund, and build roadway, ~~and~~ bikeway, and pedestrian improvements, and to address phasing and construction of traffic infrastructure throughout the city.	Verify vibration control policies are incorporated into Final General Plan and LCP Update	With adoption of Final General Plan and LCP Update	Once	City of Morro Bay Community Development Department			