

**City of Morro Bay and  
Cayucos Sanitary District**

**OFFSHORE MONITORING  
AND REPORTING PROGRAM**

**SEMI-ANNUAL EFFLUENT SAMPLING**

**CHEMICAL AND BIOASSAY  
ANALYSIS RESULTS**

**JULY 2008**



**Marine Research Specialists**

**3140 Telegraph Rd., Suite A  
Ventura, California 93003**

**Report to**  
**City of Morro Bay and**  
**Cayucos Sanitary District**

**955 Shasta Avenue**  
**Morro Bay, California 93442**  
**(805) 772-6272**

**MONITORING**  
**AND**  
**REPORTING PROGRAM**

**SEMI-ANNUAL EFFLUENT REPORT**

**CHEMICAL AND BIOASSAY**  
**ANALYSIS RESULTS**

**JULY 2008**

**Prepared by**

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**August 2008**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Mr. Bruce Ambo  
City of Morro Bay

Date \_\_\_\_\_

# marine research specialists

3140 Telegraph Road, Suite A • Ventura, CA 93003 • (805) 644-1180

Mr. Bruce Keogh  
Wastewater Division Manager  
City of Morro Bay  
955 Shasta Avenue  
Morro Bay, CA 93442

8 August 2008

## **Reference: Chemical and Bioassay Analysis Results for Effluent Samples Collected in July 2008**

Dear Mr. Keogh:

Enclosed are the results of:

- A chronic bioassay conducted on an effluent composite sample collected on 14 July 2008;
- An acute bioassay conducted on four effluent grab samples collected daily from 14 July through 17 July 2008;
- Chemical and radionuclide analyses conducted on an effluent composite sample collected on 2 July 2008;
- Ammonia measured in an effluent grab sample collected on 2 July 2008; and
- Phenolic compounds measured in an effluent grab sample collected on 16 July 2008.

All chemical analyses were conducted in accordance with the requirements of Monitoring and Reporting Program Number 98-15<sup>1</sup> to assess compliance with effluent limitations specified in the Waste Discharge Requirements of the NPDES Discharge Permit.<sup>2</sup> Bioassay protocols conformed to the revised requirements specified by RWQCB<sup>3</sup> staff that eliminated techniques previously used to mitigate interference from ammonia toxicity.<sup>4</sup>

All of the measured chemical concentrations and toxicity endpoints complied with the limitations specified in the current discharge permit. This includes acute-toxicity limitations that are no longer promulgated by the current version of the California Ocean Plan<sup>5</sup> because they were determined to be unnecessarily stringent. This cover letter summarizes the bioassay results and discusses the chemical compounds that were detected in the effluent samples. The full laboratory results as well as the pertinent QA/QC data and chains of custody are included as attachments.

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<sup>1</sup> Monitoring and Reporting Program No. 98-15 for City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County promulgated by the State of California Regional Water Quality Control Board Central Coast Region and the United States Environmental Protection Agency Region IX, San Francisco California. 11 December 1998

<sup>2</sup> State of California Regional Water Quality Control Board Central Coast Region Waste Discharge Requirements Order No. 98-15 and United States Environmental Protection Agency Region IX, San Francisco California National Pollutant Discharge Elimination System Permit No. CA0047881 for City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County

<sup>3</sup> California Regional Water Quality Control Board, Central Coast Division

<sup>4</sup> Letter from Roger W. Briggs, Executive Officer of the RWQCB to Mr. Bruce Keogh, City of Morro Bay WWTP, dated 14 March 2003: 2002 Annual Offshore monitoring Report, City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County

<sup>5</sup> State Water Resources Control Board (SWRCB). 2001. Water quality control plan, ocean waters of California, California Ocean Plan. California Environmental Protection Agency. Effective December 3, 2001

**Table 1. Comparison of Measured Toxicity Levels with Permit Limitations**

Bioassay Test	End Point (%)	Toxicity Concentration (TU)	Permit Limitations (TU)		
			30-day Average	7-day Average	Instantaneous Maximum
Chronic: Giant Kelp ( <i>Macrocystis pyrifera</i> )					
Chronic Germination	18 <sup>8</sup>	5.56			134
Chronic Growth	18 <sup>8</sup>	5.56			134
Acute:					
Fathead Minnow ( <i>Pimephales promelas</i> )	>70.7 <sup>9</sup>	1.41	1.5	2.0	2.5

### Chronic Bioassay

As summarized in Table 1, the chronic bioassays demonstrated that effluent toxicity to marine organisms was an order of magnitude lower than the limitations specified in the NPDES permit. Results were comparable to the low toxicities determined in tests conducted for more than a decade. Chronic bioassays provide a far more sensitive and accurate measure of toxic effects to marine organisms than do acute toxicity tests, which are plagued with interference from ammonia, as is described below. As with past bioassays, the chronic toxicity tests conducted in July 2008 measured spore germination and growth response in giant kelp (*Macrocystis pyrifera*) after exposure to a range of effluent dilutions. Toxic screening studies conducted in 1993<sup>6</sup> established that giant kelp (*M. pyrifera*) is substantially more sensitive to MBCSD<sup>7</sup> effluent than other standard test species, such as the larvae of the inland silverside (*Menidia beryllina*) and bay mussel (*Mytilus edulis*).

The chronic bioassay results presented in Table 1 demonstrate the effluent's continuing low toxicity to this most-sensitive marine species. Both chronic-toxicity concentrations (5.56 TUc) were more than 20-times lower than the applicable permit limitation (134 TUc). The reported chronic toxic units (TUc) were based on a 'No Observable Effects Concentration' (NOEC), which is the highest effluent concentration that does not cause an adverse effect statistically different from a control sample. Chronic bioassays did not reveal adverse effects in marine organisms with effluent concentrations at or below 18%, while the permit allows adverse effects in concentrations as low as 0.75%.

As part of quality control, chronic bioassays were also conducted using a reference toxic chemical (copper chloride) to determine the sensitivity of this particular set of giant kelp spores (*M. pyrifera*) to toxins. Results demonstrated that the kelp specimens were susceptible to toxic exposure because they experienced a significant reduction in germination and growth with copper chloride concentrations as low as 32 µg/L. The concomitant NOECs for the reference toxicant of 18 µg/L for germination and growth were comparable to toxic concentrations found in reference tests conducted over the last several years.<sup>10</sup> Consequently, this particular batch of kelp spores was demonstrably susceptible to toxic materials but was only minimally affected by exposure to treatment-plant effluent.

<sup>6</sup> Table 2-4, Page 2-7 of the MBCSD 1993 Annual Monitoring. Report to the City of Morro Bay and Cayucos Sanitary District. Prepared by Marine Research Specialists, February 1994.

<sup>7</sup> City of Morro Bay and the Cayucos Sanitary District, joint owners of the wastewater treatment and disposal facility

<sup>8</sup> NOEC or the No Observed Effects Concentration, which is the highest concentration of effluent that did not produce an adverse effect statistically different from the control experiment

<sup>9</sup> LC<sub>50</sub> or the effluent concentration that produces mortality in 50% of the test organisms exposed to the toxicants for 96 hours

<sup>10</sup> cf. The Giant Kelp Germ Tube Growth Laboratory Control Chart attached to this report

### Acute Bioassay

In contrast to the chronic toxicity test, the results of the acute bioassay were confounded by toxic interference caused by the presence of ammonia in the test sample. Current bioassay protocols<sup>11</sup> limit the use of techniques that, in the past, have been widely applied to reduce the confounding influence of ammonia during acute bioassay tests. The acute bioassay test examined the mortality of the Fathead Minnow (*Pimephales promelas*) exposed to various concentrations of effluent. Historically, Fathead Minnow tests have reliably evaluated the toxicity of a broad range of freshwater, marine, and effluent samples. However, they are problematic when test samples contain ammonia, a constituent that is naturally elevated in sewage-derived wastewater. Under ambient ocean conditions, ammonia is not particularly toxic to marine organisms. This is reflected by the strikingly high limit for ammonia concentrations that is specified in the NPDES discharge permit (804 mg/L)<sup>12</sup> as compared to typical effluent ammonia concentrations ( $\leq 39$  mg/L).<sup>13</sup> This is because ammonia remains in a relatively benign, ionic ammonium<sup>14</sup> form in seawater and wastewater. However, in an acute bioassay, effluent remains static in the test chambers for an extended period of time, during which complex interactions among the organic constituents cause pH to increase. As pH increases, ammonium is converted into a deionized ammonia form<sup>15</sup> that is highly toxic to the test organisms. In contrast to the static conditions in the test chambers, the pH of the marine receiving waters is stabilized by the highly buffered oceanic carbonate system. Thus, the acute bioassay tests are not representative of the alkalinity conditions in the ocean environment and, as a result, the tests report artificially elevated toxic concentrations.

Various methods have been developed over the years to reduce the well-recognized artifactual toxicity that results from changes in wastewater ammonia during bioassay tests.<sup>16</sup> Ammonia interference in the acute bioassays conducted on MBCSD effluent samples has previously been successfully reduced through the use of zeolite pretreatment. As a result, in the 21 acute tests conducted since 1997, and prior to April 2003, the highest measured acute toxicity was 0.59 TUa. This practice was discontinued in April 2003 when the RWQCB staff specified the use of new EPA protocols in their comments on the 2002 Annual Monitoring Report for the MBSCD Wastewater Discharge.<sup>17</sup> Among other changes, the new protocols use much younger, smaller test specimens, and encourage the use of sample-renewal techniques to reduce moderate levels of ammonia interference, rather than chemical techniques. Based on this, the RWQCB staff further required that the acute toxicity tests no longer implement any form of chemical sample manipulation to reduce toxic ammonia interference.

Unfortunately, renewal methods, in which test chambers are periodically refreshed with new sample solutions, are significantly more complex and costly to implement than previous bioassay procedures. More importantly, they fall far short of eliminating significant artifactual toxicity arising from ammonia deionization. As a result, the acute toxicity reported here is conspicuously elevated compared to past tests, although it remained below the permitted limit. The apparent increase is not attributable to an actual change in the characteristic toxicity of the effluent itself. Instead, it is an artifact of changes in the protocols used to

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<sup>11</sup> Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, Fifth Edition. October 2002. U.S. Environmental Protection Agency, Office of Water (4303T), 1200 Pennsylvania Avenue, NW Washington, DC 20460. EPA-821-R-02-012

<sup>12</sup> Instantaneous maximum ammonia concentration specified in the NPDES waste-discharge requirements for the MBCSD effluent

<sup>13</sup> Marine Research Specialists (MRS). 2008. City of Morro Bay and Cayucos Sanitary District, Offshore Monitoring and Reporting Program, 2007 Annual Report. Submitted February 2008 to the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA

<sup>14</sup>  $\text{NH}_4^+$

<sup>15</sup>  $\text{NH}_3$

<sup>16</sup> Mercer, B.W., Ames, L.L., Touhill, C.J., Slyke, W.J., Dean, R.B., 1970. Ammonia removal from secondary effluents by selective ion exchange. *Journal of the Water Pollution Control Federation* 42 (2, Part 2), R95–R107.

<sup>17</sup> RWQCB, 2003 (Footnote 4) *op. cit.*

assess acute toxicity. This is obvious because there has been no commensurate increase in the accompanying chronic-toxicity measurements.

Because static renewal is only marginally effective in accommodating pH-induced ammonia interference, extraordinary measures were instituted in an attempt to reduce impacts from ammonia toxicity to the maximum extent possible. For example, the current bioassay protocols were implemented using daily effluent grab samples that were hand delivered to the testing facility in Ventura California, shortly after collection at the MBCSD treatment plant. Extra care was also taken to remove all headspace in sample containers and to maintain a uniform sample temperature during transit to the bioassay laboratory. Finally, care was also taken during renewal in the laboratory to avoid physical impact to the extremely small larval-fish specimens.

Despite these extraordinary measures, the presence of ammonia toxicity was unmistakable during the tests. The artificially elevated acute toxicity that is reported in Table 1 is a direct result of this testing-related toxicity. The test results incorrectly imply that the effluent acute toxicity was only 0.09 TUa below the permitted limit, or 94% of the permitted toxicity. In reality, the effluent discharge does not result in pH-induced ammonia toxicity, oxygen depletion, or physical stress on marine organisms upon discharge into receiving waters. Consequently, the reported results do not accurately reflect the toxicity that is experienced by marine organisms exposed to MBCSD effluent. Instead, ancillary measurements collected during the tests demonstrate that all of these confounding influences were present, and that they caused elevated measured toxicities that were close to the NPDES discharge permit limit.

The impact of unmitigated ammonia interference on the acute bioassay is evident in the water quality measurements reported in the attached raw test data. The increase in the toxic deionized form of ammonia can be computed from the changes in pH measured in the test chambers. On the first day of the test, July 14, pH increased from 7.5 to 8.4 in the test chamber containing 100% effluent. This caused toxic deionized ammonia concentrations to increase by seven-fold, from 0.5 mg/l to 4.1 mg/l, and resulted in the mortality of all 20 of the test specimens in the two test chambers containing 100% effluent on the first day of the test. In test chambers with lower effluent concentrations, daily static renewal was only partially successful at ameliorating pH fluctuations. However, because the effluent was diluted, the concentrations of deionized ammonia were proportionally smaller, and despite the observed increases in pH, all organisms survived in the other test chambers. Nevertheless, the impacts apparent in the test chambers containing 100% effluent demonstrate that artificial ammonia toxicity was not sufficiently accommodated by static renewal methods.

As part of the quality control procedures, acute bioassay tests were also conducted using a reference toxic chemical<sup>18</sup> in order to determine the relative sensitivity of the test organisms. Results demonstrated that the batch of Fathead Minnows (*P. promelas*) used in the July 2008 bioassay were susceptible to toxic exposure. This is evident because they experienced 100% mortality in concentrations as low as 8 mg/L of the reference toxicant.<sup>19</sup> The concomitant LC<sub>50</sub> for the reference toxicant was 5.2 mg/L, which was comparable to the average toxic concentrations found in reference tests conducted in previous years.

### **Quantifiable Chemical Constituents**

The nontoxic character of the MBCSD effluent was confirmed by the general absence of chemical contaminants within the grab and composite samples collected on 2 July, and 16 July 2008. The samples were tested for the presence of 164 chemical compounds. Table 2 shows that only eight compounds were detected in quantifiable amounts in the July-2008 effluent samples. These compounds were ammonia, copper, lead, zinc, cyanide, chloroform, a non-chlorinated phenolic compound (3 &4 methylphenol), and a commonly occurring phthalate compound (bis 2-ethylhexyl phthalate). Table 2 also shows that the concentrations measured for these eight compounds were all well below the discharge limitations promulgated by the NPDES permit. The permit limits were derived from the receiving-water objectives

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<sup>18</sup> Sodium dodecyl sulfate

<sup>19</sup> cf. The Larval Fathead Minnow Juvenile Acute Laboratory Control Chart attached to this report

**Table 2. Comparison of Effluent Chemical and Radionuclide Concentrations with NPDES Permit Limitations**

Constituent	Units	Concentration	
		Measured	Limitation <sup>23</sup>
Copper	µg/L	14.	140.
Lead	µg/L	1.1	270.
Zinc	µg/L	58.	1,620.
Cyanide	µg/L	5.8	130.
Chloroform	µg/L	1.0	17,400. <sup>24</sup>
Bis (2-ethylhexyl) phthalate	µg/L	18.	470. <sup>24</sup>
Non-Chlorinated Phenolic Compounds <sup>25</sup>	µg/L	4.9	4,020. <sup>26</sup>
Radioactivity (gross α)	pCi/L	0.448±0.562	15. <sup>27</sup>
Radioactivity (gross β)	pCi/L	12.±0.52	50. <sup>27</sup>
Ammonia (as N)	mg/L	29.	80.4

stated in Table B of the California Ocean Plan,<sup>20</sup> and a critical initial dilution ratio of 133:1 computed from a conservative oceanic dispersion model applied to the MBCSD outfall.<sup>21</sup> Because the PQL's<sup>22</sup> for nearly all undetected compounds were well below their respective permit limits, the chemical analyses were sensitive enough to detect potentially toxic levels of compounds in the effluent. All analyses were conducted in accordance with EPA protocols.

Most of the compounds found in Table 2 have been routinely detected at low but quantifiable concentrations within effluent<sup>28</sup> and biosolid<sup>29</sup> samples collected over the past decade. Ammonia as nitrogen<sup>30</sup> is measured in effluent grab samples that are collected on a monthly basis. It has always been present in detectable concentrations that average approximately 25 mg/L, well below the most-stringent permit limit of 80.4 mg/L, which applies to a 6-month median.

### Metals

The presence of copper, lead, and zinc at low concentrations within the July effluent sample is not indicative of any significant new contaminant sources within the influent stream. Unlike synthetic organic compounds, these metals occur naturally within the mineralogy of sediments along the central California coast. They enter the wastewater collection system through erosion of natural mineral deposits. All three compounds

<sup>20</sup> State Water Resources Control Board (SWRCB). 1997. California Ocean Plan, Water Quality Control Plan Ocean Waters of California. State Water Resources Control Board, California Environmental Protection Agency. Effective July 23, 1997.

<sup>21</sup> See the discussion beginning on Page III-1 in: Supplement to the 2003 Renewal Application for Ocean Discharge under NPDES Permit No. CA0047881. Prepared for the City of Morro Bay, Morro Bay, CA, July 2003.

<sup>22</sup> The Practical Quantification Limit is the smallest quantifiable concentration based on the sample size and analytical technique.

<sup>23</sup> 6-month median limitation unless otherwise indicated

<sup>24</sup> 30-Day Average

<sup>25</sup> The limit on non-chlorinated phenolic compounds applies to sum of concentrations determined in an effluent grab sample.

<sup>26</sup> Only one non-chlorinated phenolic compound, 3&4 methylphenol, was detected in the effluent grab sample at a concentration of 4.9 µg/L. 3&4 methylphenol was also present in the effluent composite sample, but at a concentration of 1.8 µg/L, which was below the 2-µg/L PQL.

<sup>27</sup> Drinking Water Limit

<sup>28</sup> Table 14 (Page III-20) in: Supplement to the 2003 Renewal Application for Ocean Discharge under NPDES Permit No. CA0047881. Prepared for the City of Morro Bay, Morro Bay, CA, July 2003.

<sup>29</sup> Table 22 (Page III-78) *op. cit.*

<sup>30</sup> NH<sub>3</sub>-N

also enter wastewater collection systems through internal corrosion of household plumbing systems. Lead can also be introduced into collection systems from the illegal dumping of lead-based paints, gasoline, or fuel-contaminated dusts. Regardless, given the history of consistently low, but detectable, lead concentrations within MBCSD effluent, these latter methods of lead introduction are probably not a common occurrence, and are not likely to have contributed tangibly to the concentrations measured in the July 2008 effluent sample.

In addition, the measured concentrations of copper (14 µg/L), lead (1.1 µg/L), and zinc (58 µg/L) were low, and only slightly above their respective PQLs (10 µg/L, 1 µg/L, and 50 µg/L). Relative to the respective limits specified in the NPDES discharge permit for 6-month median concentrations, the observed copper concentration was an order of magnitude lower, while the measured concentration of lead was 200 times lower, and zinc concentrations were three orders of magnitude lower.

### ***BEHP***

The phthalate compound, bis (2-ethylhexyl) phthalate (BEHP), is a ubiquitous compound that has also been consistently detected at low levels in effluent and biosolid samples collected over the past decade. Phthalate esters, such as BEHP, are components of synthetic dyes, resins, plasticizers, insecticides, and, pharmaceuticals. Nearly 2.7 million metric tons (6 billion pounds) of phthalate esters are produced each year, of which more than half is BEHP. BEHP is a physical plasticizer that is added to plastic resins to soften them, providing increased flexibility. It is not, however, covalently bound to the resin, which allows it to slowly leach out of the plastic and into the environment over time, through evaporation or dissolution. Because of their mobility, high vapor pressure, and the massive scale at which they are produced, phthalate esters, and BEHP in particular, have become pervasive in the environment. However, although this phthalate compound can negatively affect human health, concentrations would have to be more than 26-times higher than those measured in July 2008 to be of a human-health concern.

### ***Chloroform***

Chloroform is part of a group of compounds known as halomethanes. These compounds are common by-products of wastewater and drinking water chlorination which form during the chlorine disinfection process when organic substances are present. Chloroform has been detected in approximately half of the effluent samples collected over the last decade and a half. However, at the low concentrations normally detected, it is not clear whether the presence of chloroform derives from wastewater disinfection within the treatment plant, or is the result of drinking-water chlorination. Although halomethanes, including chloroform, can negatively affect human health, the concentration of chloroform detected in July 2008 was more than four orders of magnitude below the permitted limit.

### ***Phenolic Compounds***

3&4 methylphenol (p-cresol) is a non-chlorinated phenolic compound that is a natural product present in many foods, crude oil, and coal tar. It is also detected in animal and human urine. In addition to its industrial uses, p-cresol is also used as an antiseptic and disinfectant because of its bactericidal and fungicidal properties. As a metabolite of toluene, p-cresol is a known toxin; however, the combined concentrations of all non-chlorinated phenolic compounds in the grab sample would have to be more than two orders of magnitude higher than those measured to be of concern to marine organisms.

### ***Radioactivity***

As in the past, radioactivity was also measured in effluent samples at low levels that are well below drinking water standards. Alpha particle activity arises from natural mineral deposits that enter the collection system through erosion. Beta particle activity arises from radioactive decay in both natural and man-made materials.

### **Cyanide**

At a concentration of 5.8 µg/L, cyanide was the only additional compound whose concentration was detected at quantifiable levels within the July-2008 effluent sample. However, as with the other detected compounds, cyanide's measured concentration was low compared to its permit limitation and therefore, not of ecological concern. Cyanide has been detected at quantifiable levels within 17% of the effluent samples collected in the past decade and a half, and is commonly found in low concentrations in biosolids.<sup>31</sup>

Although typically not present in significant amounts in wastewater influent, there are many natural sources of cyanide. It is frequently used in pigments and can be introduced into the collection system during photo processing, newspaper printing, jewelry making, chemicals used to develop photographs, electroplating, and metal cleaning. Cyanide is also a component in many insecticides.

In addition to natural sources, a growing body of evidence indicates that many measurements of elevated cyanide in effluent may be artifacts of the analytical protocol used for the analysis.<sup>32</sup> This question is currently being explored in a national research study sponsored by the Water Environment Research Foundation (WERF). Previous WERF studies have also indicated that cyanide levels can be increased by chlorination in the treatment plant disinfection process. Cyanide is also a byproduct of other disinfection procedures, for example, those employing ultraviolet irradiation.<sup>33,34</sup> Until recently, much of the chemistry surrounding the formation and/or degradation of cyanide in treatment plant processes was largely unknown. However, in 2003, the WERF confirmed that most, if not all, treatment plants produce cyanide in their treatment process.<sup>35</sup> Although cyanide formation patterns varied significantly among treatment plants, the chlorination of thiocyanate seemed to be the most important mechanism for the formation of cyanide in wastewater treatment processes

### **Detected, but Non-Quantifiable Chemical Constituents**

In addition to the eight chemical compounds measured in effluent samples at quantifiable concentrations, five other constituents were detected at levels too minute to be accurately quantified by standard laboratory procedures. These compounds are listed in Table 3 along with their estimated concentrations. They include two naturally occurring metals (nickel and selenium), two gasoline-related compounds (toluene and xylene), and a deodorizer (1,4-dichlorobenzene).

As with most metals, nickel and selenium occur naturally in the regional mineralogy. 1,4-dichlorobenzene is used to control moths, molds, and mildew, and to deodorize restrooms and waste containers. The gasoline-related compounds, toluene and xylene, comprise two of the four aromatic hydrocarbon compounds collectively known as BTEX (benzene, toluene, ethyl benzene, and xylene). BTEX compounds are primarily associated with gasoline contamination. All have been occasionally detected in quantifiable concentrations in effluent samples collected in prior years.

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<sup>31</sup> Table 22 (Page III-77) *op. cit.*

<sup>32</sup> Khoury, J.; Pang, M.; Young, C.; Pandit, A.; Carr, S.; and Fischer, D. (2005) Cyanide generation during preservation of chlorinated wastewater effluent samples for total cyanide analysis. Water Environment Research, Submitted Nov 07, 2005.

<sup>33</sup> Zheng A, Dzombak DA, Luthy RG, Kavanaugh MC, Deeb RA. 2004. The occurrence of cyanide formation in six full-scale publicly owned treatment works. Water Environ Res. 2004 Mar-Apr;76(2):101-12

<sup>34</sup> Zheng, Anping; Dzombak, David A.; Zheng, Richard G. 2004. Effects of Nitrosation on the Formation of Cyanide in Publicly Owned Treatment Works Secondary Effluent. Water Environment Research, Volume 76, Number 3, May/June 2004, pp. 197-204(8)

<sup>35</sup> WERF. 2003. Cyanide formation and fate in complex effluents and its relation to water quality criteria. publication No. 98-HHE-5. Water Environment Research Foundation, Alexandria, Va.

**Table 3. Effluent Constituents Detected at Non-Quantifiable Concentrations**

Constituent	Units	MDL	Concentration		
			Estimated <sup>36</sup>	PQL	Limitation <sup>23</sup>
Nickel	µg/L	2.3	<b>5.0</b>	10.	670.
Selenium	µg/L	0.5	<b>1.8</b>	2.	2,010.
1,4-Dichlorobenzene	µg/L	0.12	<b>0.43</b>	0.5	2,410. <sup>24</sup>
Toluene	µg/L	0.12	<b>0.27</b>	0.5	11,400,000. <sup>24</sup>
Xylenes	µg/L	0.33	<b>0.47</b>	0.5	— <sup>37</sup>

### Conclusions

The comprehensive chemical and bioassay analyses conducted on effluent samples collected in July 2008 augment data collected over the last two decades. Together, the measurements demonstrate the consistently benign nature of the discharge from the MBSCD treatment plant. The absence of heavy industry within the collection area and the high performance of the treatment process are reflected in the general lack of toxicity and chemical contaminants within the effluent samples. The concentrations of the few chemical compounds that were detected in the July-2008 samples were typical of wastewater derived from domestic sources, and all were far below limits specified in the NPDES discharge permit. All measurements fully complied with the requirements and limitations specified in the current NPDES discharge permit.

Please contact the undersigned if you have questions regarding these results.

Sincerely,

Douglas A. Coats, Ph.D.  
Program Manager

Enclosure (Four Report Copies)

<sup>36</sup> Not detected at levels above the indicated practical quantification (detection) limit

<sup>37</sup> Limit not specified in the NPDES discharge permit.

**CHEMICAL ANALYSIS RESULTS**



Marine Research Specialists  
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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Organochlorine Pesticides and PCB's (EPA Method 608)

BCL Sample ID:	0808535-01		Client Sample Name:	Composite -A.R.S., 7/2/2008 12:00:00AM									
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Aldrin	ND	ug/L	0.025	0.0065	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
alpha-BHC	ND	ug/L	0.025	0.0055	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
beta-BHC	ND	ug/L	0.025	0.010	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
delta-BHC	ND	ug/L	0.025	0.0070	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
gamma-BHC (Lindane)	ND	ug/L	0.025	0.0047	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Chlordane (Technical)	ND	ug/L	2.5	1.9	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
4,4'-DDD	ND	ug/L	0.025	0.0085	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
4,4'-DDE	ND	ug/L	0.025	0.0095	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
4,4'-DDT	ND	ug/L	0.025	0.0038	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Dieldrin	ND	ug/L	0.025	0.0060	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Endosulfan I	ND	ug/L	0.025	0.0080	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Endosulfan II	ND	ug/L	0.025	0.0070	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Endosulfan sulfate	ND	ug/L	0.025	0.013	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Endrin	ND	ug/L	0.025	0.0041	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Endrin aldehyde	ND	ug/L	0.050	0.016	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Heptachlor	ND	ug/L	0.025	0.0060	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10,V11
Heptachlor epoxide	ND	ug/L	0.025	0.0050	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Methoxychlor	ND	ug/L	0.025	0.0055	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
Toxaphene	ND	ug/L	10	2.1	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
PCB-1016	ND	ug/L	1.0	0.10	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
PCB-1221	ND	ug/L	1.0	0.44	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10
PCB-1232	ND	ug/L	1.0	0.45	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10



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Project Number: [none]  
Project Manager: Doug Coats

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## Organochlorine Pesticides and PCB's (EPA Method 608)

BCL Sample ID:	0808535-01		Client Sample Name:	Composite -A.R.S., 7/2/2008 12:00:00AM										
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
PCB-1242	ND	ug/L	1.0	0.48	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10	
PCB-1248	ND	ug/L	1.0	0.12	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10	
PCB-1254	ND	ug/L	1.0	0.21	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10	
PCB-1260	ND	ug/L	1.0	0.10	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10	
Total PCB's (Summation)	ND	ug/L	1.0	0.50	EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683	ND	A10	
TCMX (Surrogate)	87.5	%	72 - 129 (LCL - UCL)		EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683		A10	
Dibutyl chlorendate (Surrogate)	0	%	82 - 177 (LCL - UCL)		EPA-608	07/08/08	07/16/08 01:42	jyt	GC-1	5	BRG0683		A10,A17	



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Project Number: [none]  
Project Manager: Doug Coats

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## Volatile Organic Analysis (EPA Method 624)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Benzene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Bromodichloromethane	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Bromoform	ND	ug/L	0.50	0.22	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Bromomethane	ND	ug/L	1.0	0.31	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	V11	
Carbon tetrachloride	ND	ug/L	0.50	0.089	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Chlorobenzene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Chloroethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Chloroform	1.0	ug/L	0.50	0.098	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Chloromethane	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Dibromochloromethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichlorobenzene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,3-Dichlorobenzene	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,4-Dichlorobenzene	0.43	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	J	
1,1-Dichloroethane	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichloroethane	ND	ug/L	0.50	0.098	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,1-Dichloroethene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichloropropane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.086	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Ethylbenzene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Methylene chloride	ND	ug/L	1.0	0.16	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		



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Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Volatile Organic Analysis (EPA Method 624)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Methyl t-butyl ether	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.22	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Tetrachloroethene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Toluene	0.27	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	J	
1,1,1-Trichloroethane	ND	ug/L	0.50	0.27	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,1,2-Trichloroethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Trichloroethene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Vinyl chloride	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Total Xylenes	0.47	ug/L	0.50	0.33	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	J	
Acrolein	ND	ug/L	20	3.7	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
Acrylonitrile	ND	ug/L	5.0	2.0	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND		
p- & m-Xylenes	0.30	ug/L	0.50	0.21	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	J	
o-Xylene	0.17	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210	ND	J	
1,2-Dichloroethane-d4 (Surrogate)	99.3	%	76 - 114 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210			
Toluene-d8 (Surrogate)	100	%	88 - 110 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210			
4-Bromofluorobenzene (Surrogate)	101	%	86 - 115 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:33	MGC	MS-V7	1	BRG0210			



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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID:	0808535-01		Client Sample Name:	Composite -A.R.S., 7/2/2008 12:00:00AM										
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Acenaphthene	ND	ug/L	2.0	0.48	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Acenaphthylene	ND	ug/L	2.0	0.64	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Aldrin	ND	ug/L	2.0	0.80	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Aniline	ND	ug/L	5.0	0.46	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Anthracene	ND	ug/L	2.0	0.79	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzidine	ND	ug/L	20	4.7	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzo[a]anthracene	ND	ug/L	2.0	0.52	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzo[b]fluoranthene	ND	ug/L	2.0	0.66	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzo[k]fluoranthene	ND	ug/L	2.0	0.80	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzo[a]pyrene	ND	ug/L	2.0	0.73	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzo[g,h,i]perylene	ND	ug/L	2.0	0.94	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzoic acid	ND	ug/L	10	6.1	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzyl alcohol	ND	ug/L	2.0	0.67	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Benzyl butyl phthalate	ND	ug/L	2.0	0.59	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
alpha-BHC	ND	ug/L	2.0	0.50	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
beta-BHC	ND	ug/L	2.0	0.48	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
delta-BHC	ND	ug/L	2.0	0.60	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
gamma-BHC (Lindane)	ND	ug/L	2.0	0.56	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
bis(2-Chloroethoxy)methane	ND	ug/L	2.0	0.58	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
bis(2-Chloroethyl) ether	ND	ug/L	2.0	0.52	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
bis(2-Chloroisopropyl) ether	ND	ug/L	2.0	0.73	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
bis(2-Ethylhexyl)phthalate	18	ug/L	5.0	1.1	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	2.5		



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Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
4-Bromophenyl phenyl ether	ND	ug/L	2.0	0.69	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4-Chloroaniline	ND	ug/L	2.0	0.87	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Chloronaphthalene	ND	ug/L	2.0	0.50	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4-Chlorophenyl phenyl ether	ND	ug/L	2.0	0.68	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Chrysene	ND	ug/L	2.0	0.73	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4,4'-DDD	ND	ug/L	2.0	0.50	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4,4'-DDE	ND	ug/L	3.0	0.58	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4,4'-DDT	ND	ug/L	2.0	0.27	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Dibenzo[a,h]anthracene	ND	ug/L	3.0	0.92	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Dibenzofuran	ND	ug/L	2.0	0.81	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
1,2-Dichlorobenzene	ND	ug/L	2.0	0.58	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
1,3-Dichlorobenzene	ND	ug/L	2.0	0.66	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
1,4-Dichlorobenzene	ND	ug/L	2.0	0.53	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
3,3-Dichlorobenzidine	ND	ug/L	10	0.88	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Dieldrin	ND	ug/L	3.0	0.52	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Diethyl phthalate	ND	ug/L	2.0	0.85	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Dimethyl phthalate	ND	ug/L	2.0	0.55	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Di-n-butyl phthalate	ND	ug/L	2.0	0.74	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4-Dinitrotoluene	ND	ug/L	2.0	0.99	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,6-Dinitrotoluene	ND	ug/L	2.0	0.74	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Di-n-octyl phthalate	ND	ug/L	2.0	0.85	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
1,2-Diphenylhydrazine	ND	ug/L	2.0	0.70	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		



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Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Endosulfan I	ND	ug/L	10	2.7	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Endosulfan II	ND	ug/L	10	2.4	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Endosulfan sulfate	ND	ug/L	3.0	0.58	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Endrin	ND	ug/L	2.0	0.54	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Endrin aldehyde	ND	ug/L	10	0.86	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Fluoranthene	ND	ug/L	2.0	0.70	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Fluorene	ND	ug/L	2.0	0.73	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Heptachlor	ND	ug/L	2.0	0.60	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Heptachlor epoxide	ND	ug/L	2.0	0.63	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Hexachlorobenzene	ND	ug/L	2.0	0.71	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Hexachlorobutadiene	ND	ug/L	2.0	0.59	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Hexachlorocyclopentadiene	ND	ug/L	2.0	0.26	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Hexachloroethane	ND	ug/L	2.0	0.52	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Indeno[1,2,3-cd]pyrene	ND	ug/L	2.0	0.92	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Isophorone	ND	ug/L	2.0	0.51	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Methylnaphthalene	ND	ug/L	2.0	0.51	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Naphthalene	ND	ug/L	2.0	0.62	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Naphthylamine	ND	ug/L	20	6.5	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Nitroaniline	ND	ug/L	2.0	0.80	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
3-Nitroaniline	ND	ug/L	2.0	0.82	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4-Nitroaniline	ND	ug/L	5.0	1.1	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Nitrobenzene	ND	ug/L	2.0	0.55	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		



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3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
N-Nitrosodimethylamine	ND	ug/L	2.0	0.45	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
N-Nitrosodi-N-propylamine	ND	ug/L	2.0	0.59	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
N-Nitrosodiphenylamine	ND	ug/L	2.0	0.80	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Phenanthrene	ND	ug/L	2.0	0.60	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Pyrene	ND	ug/L	2.0	0.62	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
1,2,4-Trichlorobenzene	ND	ug/L	2.0	0.67	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4-Chloro-3-methylphenol	ND	ug/L	5.0	0.67	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Chlorophenol	ND	ug/L	2.0	0.65	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4-Dichlorophenol	ND	ug/L	2.0	0.60	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4-Dimethylphenol	ND	ug/L	2.0	0.52	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4,6-Dinitro-2-methylphenol	ND	ug/L	10	2.2	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4-Dinitrophenol	ND	ug/L	10	2.4	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Methylphenol	ND	ug/L	2.0	0.57	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
3- & 4-Methylphenol	1.8	ug/L	2.0	0.83	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND	J	
2-Nitrophenol	ND	ug/L	2.0	0.42	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
4-Nitrophenol	ND	ug/L	2.0	1.7	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Pentachlorophenol	ND	ug/L	10	0.45	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
Phenol	ND	ug/L	2.0	0.37	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4,5-Trichlorophenol	ND	ug/L	5.0	0.93	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2,4,6-Trichlorophenol	ND	ug/L	5.0	0.43	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694	ND		
2-Fluorophenol (Surrogate)	44.2	%	26 - 92 (LCL - UCL)		EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694			
Phenol-d5 (Surrogate)	43.2	%	11 - 70 (LCL - UCL)		EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694			



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Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

<b>BCL Sample ID:</b> 0808535-01	<b>Client Sample Name:</b> Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru- ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Nitrobenzene-d5 (Surrogate)	78.2	%	47 - 121	(LCL - UCL)	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694		
2-Fluorobiphenyl (Surrogate)	69.6	%	43 - 111	(LCL - UCL)	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694		
2,4,6-Tribromophenol (Surrogate)	74.9	%	44 - 124	(LCL - UCL)	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694		
p-Terphenyl-d14 (Surrogate)	84.3	%	46 - 102	(LCL - UCL)	EPA-625	07/07/08	07/16/08 23:41	SKC	MS-B1	0.960	BRG0694		



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3140 Telegraph Road, Suite A  
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Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Organo-Phosphorus Pesticide Analysis (EPA Method 8140)

BCL Sample ID:	0808535-01		Client Sample Name:	Composite -A.R.S., 7/2/2008 12:00:00AM									
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Azinphos methyl	ND	ug/L	0.20	0.055	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	V11
Bolstar	ND	ug/L	0.20	0.055	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Chlorpyrifos	ND	ug/L	0.20	0.024	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Coumaphos	ND	ug/L	0.20	0.054	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	V11
Demeton O/S	ND	ug/L	0.20	0.026	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Diazinon	ND	ug/L	0.20	0.044	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Dichlorvos	ND	ug/L	0.20	0.070	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Disulfoton	ND	ug/L	0.50	0.039	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Ethoprop	ND	ug/L	0.20	0.025	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Fensulfothion	ND	ug/L	0.20	0.088	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Fenthion	ND	ug/L	0.20	0.033	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	V11
Merphos	ND	ug/L	0.20	0.058	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Methyl parathion	ND	ug/L	0.20	0.074	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Mevinphos	ND	ug/L	0.20	0.053	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Naled	ND	ug/L	0.20	0.072	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Phorate	ND	ug/L	0.20	0.041	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Ronnel (Fenclorophos)	ND	ug/L	0.20	0.067	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Stirophos (Tetrachlorvinphos)	ND	ug/L	0.20	0.046	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Tokuthion (Prothiofos)	ND	ug/L	0.20	0.032	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Trichloronate	ND	ug/L	0.20	0.038	EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590	ND	
Triphenylphosphate (Surrogate)	137	%	55 - 132 (LCL - UCL)		EPA-8140	07/03/08	07/14/08 13:34	oaa	GC-7	1	BRG0590		V11



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3140 Telegraph Road, Suite A  
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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 07/17/2008 17:00

### Water Analysis (General Chemistry)

<b>BCL Sample ID:</b> 0808535-01	<b>Client Sample Name:</b> Composite -A.R.S., 7/2/2008 12:00:00AM
----------------------------------	---

Constituent	Result	Units	PQL	MDL	Method	Prep	Run	Analyst	Instru- ment ID	Dilution	QC	MB	Lab
						Date	Date/Time				Batch ID	Bias	Quals
Total Cyanide	0.0058	mg/L	0.0050	0.0032	EPA-335.4	07/08/08	07/08/08 13:14	TDC	KONE-1	1	BRG0382	ND	



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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Water Analysis (Metals)

BCL Sample ID: 0808535-01		Client Sample Name: Composite -A.R.S., 7/2/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Total Antimony	ND	ug/L	100	14	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Beryllium	ND	ug/L	10	1.1	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Cadmium	ND	ug/L	10	1.4	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Chromium	ND	ug/L	10	2.3	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Copper	14	ug/L	10	1.4	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	5.4		
Total Mercury	ND	ug/L	0.20	0.016	EPA-245.1	07/15/08	07/16/08 09:32	MEV	CETAC1	1	BRG0729	ND		
Total Nickel	5.0	ug/L	10	2.3	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND	J	
Total Silver	ND	ug/L	10	2.5	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Zinc	58	ug/L	50	8.9	EPA-200.7	07/07/08	07/08/08 09:04	LDG	PE-OP2	1	BRG0358	ND		
Total Recoverable Arsenic	ND	ug/L	2.0	0.82	EPA-200.8	07/10/08	07/15/08 17:14	PRA	PE-EL1	1	BRG0621	ND		
Total Recoverable Lead	1.1	ug/L	1.0	0.053	EPA-200.8	07/10/08	07/15/08 17:14	PRA	PE-EL1	1	BRG0621	ND		
Total Recoverable Selenium	1.8	ug/L	2.0	0.50	EPA-200.8	07/10/08	07/15/08 17:14	PRA	PE-EL1	1	BRG0621	ND	J	
Total Recoverable Thallium	ND	ug/L	1.0	0.054	EPA-200.8	07/10/08	07/15/08 17:14	PRA	PE-EL1	1	BRG0621	ND		



LA Testing

159 Pasadena Avenue, South Pasadena, CA 91030

Phone: (323) 254-9960 Fax: (323) 254-9982 Email: [pasadenalab@latesting.com](mailto:pasadenalab@latesting.com)

Attn: **Tina Green**  
**BC Laboratories, Inc.**  
**4100 Atlas Court**  
**Bakersfield, CA 93308**

Fax: (661) 327-1918 Phone: (661) 327-4911  
Project: 0808535

Customer ID: 32BCLA50  
Customer PO:  
Received: 07/07/08 8:00 AM  
LA Testing Order: 320807978  
LA Testing Proj:  
Analysis Date: 7/16/2008  
Report Date: 7/16/2008

**Determination of Asbestos Structures in Water Performed by the 100.2 Method  
(EPA/600/R-94/134)**

Sample ID	Sample Prep Date	# Fibers Asbestos	# Fibers Non-Asbestos	Type(s) Of Asbestos	Analytical Sensitivity (MFL)	Confidence Limits	Concentration Of Asbestos Fibers (MFL)	Comments
0808535-01-F 320807978-0001	7/7/08 9:25	0	0		0.19	0.00-0.71	<0.19	Total area of filter examined = 0.067 mm <sup>2</sup>

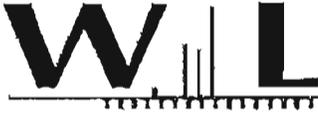
Effective filtration area = 1288 mm<sup>2</sup>. Sample received past 48 hour hold time. UV Ozonated.

Analyst(s)

*Sherrie Ahmad (1)*

Derrick Tanner, Laboratory Manager  
or other approved signatory

Sample collection and containers provided by the client, acceptable bottle blank level is defined as <=0.01MFL> 10um. ND=None Detected. This report relates only to those items tested. This report may not be reproduced, except in full, without written permission by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
ACCREDITATIONS: NVLAP 200232-0, California State DHS #2283



Report Date: Monday, July 28, 2008

Received Date: Monday, July 7, 2008

Received Time: 8:30 am

Turnaround Time: Normal

Client: BC Laboratories  
4100 Atlas Court  
Bakersfield, CA 93308

Phone: (661) 852-4204  
FAX: (661) 327-1918

Attn: Tina Green

Project: 0808535

P.O.#:

Certificate of Analysis

Work Order No: 8070702-01  
Sampled by: Client

Sample ID: 0808535-01  
Sampled: 07/02/08 00:00

Matrix: Water  
Sample Note:

Analyte	Result	Qualifier	Units	Reporting		Method	Prepared	Analyzed	Batch
				Limit	Dil				
Gross Alpha.....	0.448		pCi/L		1	SM7110C	07/09/08	07/10/08	abd W8G0284
Gross Alpha counting error (+/-).....	0.562		pCi/L		1	SM7110C	07/09/08	07/10/08	abd W8G0284
Gross Alpha MDA95.....	0.350		pCi/L		1	SM7110C	07/09/08	07/10/08	abd W8G0284
Gross Beta.....	12		pCi/L		1	EPA 900.0	07/21/08	07/24/08	aab W8G0789
Gross Beta counting error (+/-).....	0.52		pCi/L		1	EPA 900.0	07/21/08	07/24/08	aab W8G0789
Gross Beta MDA95.....	0.016		pCi/L		1	EPA 900.0	07/21/08	07/24/08	aab W8G0789



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3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 08/05/2008 13:32

### Water Analysis (General Chemistry)

<b>BCL Sample ID:</b> 0808533-01	<b>Client Sample Name:</b> Grab-A.R.S. Eff, 7/1/2008 12:00:00AM												
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instru-ment ID</b>	<b>Dilution</b>	<b>QC Batch ID</b>	<b>MB Bias</b>	<b>Lab Quals</b>
Ammonia as N (Distilled)	29	mg/L	5.0	2.5	EPA-350.1	07/11/08	07/14/08 12:38	RLP	SC-1	50	BRG0720	ND	A01

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Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0809225-03		Client Sample Name: Grab Eff, 7/16/2008 9:30:00AM											
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
4-Chloro-3-methylphenol	ND	ug/L	5.0	0.67	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2-Chlorophenol	ND	ug/L	2.0	0.65	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4-Dichlorophenol	ND	ug/L	2.0	0.60	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4-Dimethylphenol	ND	ug/L	2.0	0.52	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
4,6-Dinitro-2-methylphenol	ND	ug/L	10	2.2	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4-Dinitrophenol	ND	ug/L	10	2.4	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2-Methylphenol	ND	ug/L	2.0	0.57	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
3- & 4-Methylphenol	6.9	ug/L	2.0	0.83	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520	ND	
2-Nitrophenol	ND	ug/L	2.0	0.42	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
4-Nitrophenol	ND	ug/L	2.0	1.7	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
Pentachlorophenol	ND	ug/L	10	0.45	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
Phenol	ND	ug/L	2.0	0.37	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4,5-Trichlorophenol	ND	ug/L	5.0	0.93	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4,6-Trichlorophenol	ND	ug/L	5.0	0.43	EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2-Fluorophenol (Surrogate)	55.9	%	26 - 92 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
Phenol-d5 (Surrogate)	47.8	%	11 - 70 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
Nitrobenzene-d5 (Surrogate)	92.7	%	47 - 121 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2-Fluorobiphenyl (Surrogate)	86.2	%	43 - 111 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
2,4,6-Tribromophenol (Surrogate)	89.9	%	44 - 124 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		
p-Terphenyl-d14 (Surrogate)	123	%	46 - 102 (LCL - UCL)		EPA-625	07/17/08	07/21/08 23:35	SKC	MS-B1	1	BRG1520		S09

Sample ID: COMP EFF #1				EPA Method 8280				
Client Data		Sample Data		Laboratory Data				
Name:	Marine Research Specialists	Matrix:	Effluent	Lab Sample:	30633-001	Date Received:	3-Jul-08	
Project:	Morro Bay WWTP	Sample Size:	1.03 L	QC Batch No.:	1288	Date Extracted:	8-Jul-08	
Date Collected:	2-Jul-08			Date Analyzed DB-5:	9-Jul-08	Date Analyzed DB-225:	NA	
Time Collected:	1045							
Analyte	Conc. (ng/L)	DL <sup>a</sup>	EMPC <sup>b</sup>	Qualifiers	Labeled Standard	%R	LCL-UCL <sup>d</sup>	Qualifiers
2,3,7,8-TCDD	ND	0.0222			<u>IS</u> 13C-2,3,7,8-TCDD	67.7	25 - 150	
1,2,3,7,8-PeCDD	ND	0.0103			13C-1,2,3,7,8-PeCDD	35.5	25 - 150	
1,2,3,4,7,8-HxCDD	ND	0.0184			13C-1,2,3,4,7,8-HxCDD	65.8	25 - 150	
1,2,3,6,7,8-HxCDD	ND	0.0178			13C-1,2,3,6,7,8-HxCDD	61.9	25 - 150	
1,2,3,7,8,9-HxCDD	ND	0.0182			13C-1,2,3,4,6,7,8-HpCDD	69.0	25 - 150	
1,2,3,4,6,7,8-HpCDD	ND	0.0353			13C-OCDD	61.3	25 - 150	
OCDD	ND		0.108		13C-2,3,7,8-TCDF	83.1	25 - 150	
2,3,7,8-TCDF	ND	0.0116			13C-1,2,3,7,8-PeCDF	50.9	25 - 150	
1,2,3,7,8-PeCDF	ND	0.0153			13C-2,3,4,7,8-PeCDF	45.2	25 - 150	
2,3,4,7,8-PeCDF	ND	0.0167			13C-1,2,3,4,7,8-HxCDF	60.7	25 - 150	
1,2,3,4,7,8-HxCDF	ND	0.00693			13C-1,2,3,6,7,8-HxCDF	68.1	25 - 150	
1,2,3,6,7,8-HxCDF	ND	0.00612			13C-2,3,4,6,7,8-HxCDF	72.6	25 - 150	
2,3,4,6,7,8-HxCDF	ND	0.00704			13C-1,2,3,7,8,9-HxCDF	67.8	25 - 150	
1,2,3,7,8,9-HxCDF	ND	0.0102			13C-1,2,3,4,6,7,8-HpCDF	76.2	25 - 150	
1,2,3,4,6,7,8-HpCDF	ND	0.0120			13C-1,2,3,4,7,8,9-HpCDF	80.8	25 - 150	
1,2,3,4,7,8,9-HpCDF	ND	0.0114			13C-OCDF	67.4	25 - 150	
OCDF	ND	0.0354			<u>CRS</u> 37Cl-2,3,7,8-TCDD	87.2	25 - 150	
Totals					Toxic Equivalent Quotient (TEQ) Data <sup>e</sup>			
Total TCDD	ND	0.0222			TEQ (Min):	0		
Total PeCDD	ND		0.0246					
Total HxCDD	ND	0.0182						
Total HpCDD	ND	0.0353						
Total TCDF	ND	0.0116						
Total PeCDF	ND	0.0160						
Total HxCDF	ND	0.00744						
Total HpCDF	ND	0.0117						

Analyst: MAS

Approved By: William J. Luksemburg 11-Jul-2008 15:26

**ACUTE AND CHRONIC BIOASSAY RESULTS**

# LABORATORY REPORT



**Date:** July 20, 2008

**Client:** Marine Research Specialists  
3140 Telegraph Road, Suite A  
Ventura, CA 93003  
Attn: Doug Coats

*"dedicated to providing quality aquatic toxicity testing"*

4350 Transport Street, Unit 107  
Ventura, CA 93003  
(805) 650-0546 FAX (805) 650-0756  
CA DOHS ELAP Cert. No.: 1775

**Laboratory No.:** A-08071502  
**Sample I.D.:** Morro Bay Effluent

**Sample Control:** The samples were received by ATL within the recommended hold time, in a chilled state, and with the chain of custody records attached.

Date Sampled:	07/14/08	07/15/08	07/16/08	07/17/08
Date Received:	07/15/08	07/16/08	07/17/08	07/18/08
Temp. Received:	2°C	0.5°C	1.5°C	2°C
Chlorine (TRC):	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l
Dates Tested:	07/15/08 to 07/19/08			

**Sample Analysis:** The following analyses were performed on your sample:  
Fathead Minnow 96hr Acute Static-Renewal Toxicity Test (EPA Method 2000.0),  
Giant Kelp Germination and Growth Short-Term Toxicity Test (EPA Method 1009.0).  
Attached are the test data generated from the analysis of your sample.

## Result Summary:

<u>Sample ID.</u>	<u>Test</u>	<u>LC50</u>	<u>TUa</u>
Grab Effluent	Fathead Minnow	70.7%	1.41
Comp Effluent	Kelp Germination:	<u>NOEC</u> 18%	<u>TUc</u> 5.56
	Kelp Growth:	18%	5.56

**Quality Control:** Reviewed and approved by:

Joseph A. LeMay  
Laboratory Director

# FATHEAD MINNOW ACUTE NPDES TEST



Lab No.: A-08071502  
 Client/ID: MRS - Morro Bay

Start Date: 07/15/2008

## TEST SUMMARY

Species: *Pimephales promelas*.  
 Age: 8 (1-14) days.  
 Regulations: NPDES.  
 Test solution volume: 250 ml.  
 Feeding: prior to renewal at 48 hrs.  
 Aeration: None, unless DO drops below 4.0 mg/l.  
 Number of replicates: 2.  
 Dilution water: Moderately hard reconstituted water.  
 QA/QC Batch No.: RT-080410.

Source: In-laboratory Culture.  
 Test type: Static-Renewal.  
 Test Protocol: EPA-821-R-02-012.  
 Endpoints: Percent Survival at 96 hrs.  
 Test chamber: 500 ml beakers.  
 Temperature: 20 +/- 1°C.  
 Number of fish per chamber: 10.  
 Photoperiod: 16/8 hrs light/dark.

## INITIAL WATER QUALITY PARAMETERS

Additional Parameters	Control	100% Sample			
		Day 1	Day 2	Day 3	Day 4
Temperature (°C)	20.9	2	0.5	1.5	2
DO (mg/l)	8.8	7.6	7.7	8.4	8.2
pH	8.1	7.5	7.6	7.7	7.7
Total Res. Chlorine (mg/l)	0	0.0	0	0	0
Ammonia (mg/l NH <sub>3</sub> -N)**	<0.2	44	40	48	48
Alkalinity (mg/l CaCO <sub>3</sub> )	66	338	313	312	318
Hardness (mg/l CaCO <sub>3</sub> )	90	220	308	292	310
Conductivity (umhos)	340	1435	1920	1790	1835

### Comments:

\* Chlorine neutralized with sodium thiosulfate (one drop per liter of 10% solution).

\*\* Ammonia reading by Hach Kit - only approximate indication.

Concentration-response relationship acceptable? (see attached computer analysis):

Yes (response curve normal)

No (dose interrupted indicated or non-normal)

Acute Fish Test-96 Hr Survival

Start Date: 7/15/2008 16:00 Test ID: 8071502f Sample ID: CA0047881-Morro Bay SD  
 End Date: 7/19/2008 15:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 7/14/2008 09:00 Protocol: ACUTE-EPA-821-R-02-012 Test Species: PP-Pimephales promelas  
 Comments:

Conc-%	1	2
D-Control	1.0000	1.0000
6.25	1.0000	1.0000
12.5	1.0000	1.0000
25	1.0000	1.0000
50	1.0000	1.0000
100	0.0000	0.0000

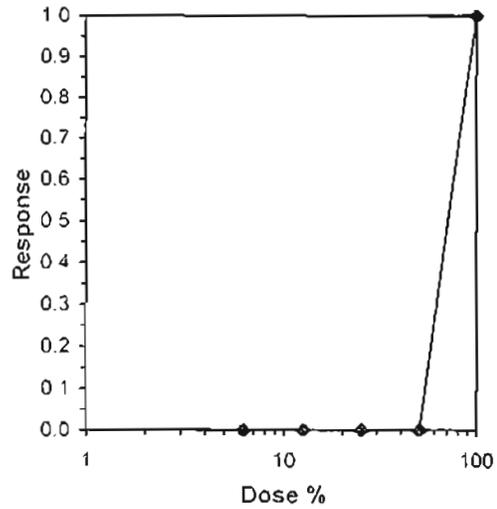
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	Number Resp	Total Number
			Mean	Min	Max	CV%				
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20	
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20	
12.5	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20	
25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20	
50	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20	
100	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Graphical Method	
Trim Level	EC50
0.0%	70.711

70.711

$$TU_a = 1.41$$



# FATHEAD MINNOW ACUTE NPDES TEST



Lab No.: A-08071502

Client/ID: MRS - Morro Bay

Start Date: 07/15/2008

## RAW TEST DATA

		DAY 1		DAY 2		DAY 3		DAY 4		
		0 hr	24hr							
Analyst Initials:		<i>Ru</i>								
Time of Readings:		1100	1400	1400	1400	1400	1500	1500	1500	
Control	DO	8.8	7.3	8.8	7.1	8.8	7.7	9.3	6.6	
	pH	8.1	8.1	8.1	7.9	8.1	8.0	8.2	8.0	
	Temp	20.9	20.2	20.8	20.2	20.5	20.1	20.5	20.2	
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
6.25%	DO	8.7	6.7	8.7	6.4	8.8	8.0	9.3	6.9	
	pH	7.9	8.0	8.0	7.8	8.0	8.0	8.1	7.9	
	Temp	20.8	20.2	20.7	20.2	20.5	20.1	20.5	20.2	
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
12.5%	DO	8.6	6.2	8.6	6.4	8.7	8.0	9.1	6.8	
	pH	7.8	8.0	7.9	7.8	8.0	7.9	8.1	7.9	
	Temp	20.7	20.2	20.6	20.3	20.4	20.1	20.5	20.3	
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
25%	DO	8.5	5.5	8.5	7.4	8.7	8.2	9.0	6.5	
	pH	7.7	8.0	7.8	8.1	7.9	8.1	8.0	7.9	
	Temp	20.6	20.2	20.5	20.2	20.3	20.2	20.4	20.3	
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
50%	DO	8.3	7.4	8.3	7.4	8.6	7.5	8.8	6.6	
	pH	7.6	8.3	7.7	8.2	7.8	8.0	7.8	8.1	
	Temp	20.2	20.3	20.2	20.3	20.0	20.2	20.3	20.3	
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
100%	DO	7.6	7.7	-	-	-	-	-	-	
	pH	7.5	8.4	-	-	-	-	-	-	
	Temp	19.6	20.3	-	-	-	-	-	-	
	# Alive	Rep A	---	0	---	-	---	-	---	-
		Rep B	---	0	---	-	---	-	---	-

# *Giant Kelp Germination and Germ Tube Growth Short-Term Toxicity Test*

- *Test and Result Summary*
- *Data Summary and Statistical Analysis*
- *Raw Test Data: Water Quality &  
Test Organism Measurements*

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



Lab No.: A-08071502-002  
Client/ID: MRS - Morro Bay Comp. Effluent

Date Tested: 07/15/08 - 07/17/08

## TEST SUMMARY

Species: <i>Macrocystis pyrifera</i> .	Source: Field collected.
Protocol: EPA Method 1009.0.	Dilution water: Lab seawater.
Test type: Static.	Endpoints: NOEC, IC25 at 48 hrs.
Test chamber: glass beaker.	Test volume: 200 ml.
Temperature: 15 +/- 1°C.	Aeration: None.
Number of spores per ml: 7,500 (approx.).	Number of replicates: 5.
QA/QC Batch No.: RT-080715 (ran concurrently).	

## RESULTS SUMMARY

Sample Concentration	Percent Germination		Mean Germ Tube Length (μm)	
Control (Brine)	87.1%		15.80	
Control (Dilution)	82.8%		15.65	
5.6%	84.8%		17.15	
10%	86.0%		17.40	
18%	84.4%		16.40	
32%	66.3%	*	13.05	*
56%	32.4%	*	8.70	*

\* Statistically significantly less than control at P = 0.05 level

## CHRONIC TOXICITY

END POINT	GERMINATION	GERM TUBE LENGTH
NOEC	18%	18%
TUc (100/NOEC)	5.56	5.56

## QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination ≥ 70%	Yes (87.1%)
Mean control germination tube length > 10 μm	Yes (15.80 μm)

Please see RT-080715 report for additional test acceptability criteria.

**Macrocystis Germination and Growth Test-Proportion Germinated**

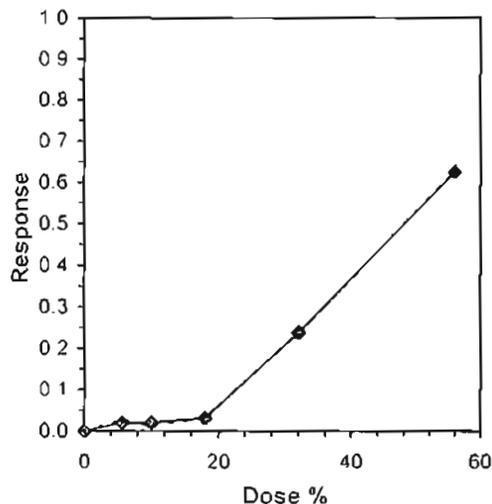
Start Date: 7/15/2008 14:00 Test ID: 8071502k Sample ID: CA0047881-Morro Bay SD  
 End Date: 7/17/2008 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 7/14/2008 09:05 Protocol: WCCH-EPA-600-R-95-136 Test Species: MP-Macrocystis pyrifera  
 Comments:

Conc-%	1	2	3	4	5
B-Control	0.9038	0.8431	0.9020	0.8679	0.8400
D-Control	0.8119	0.8529	0.8505	0.8462	0.7810
5.6	0.8824	0.8529	0.8462	0.8077	0.8491
10	0.9020	0.8627	0.8692	0.8544	0.8137
18	0.8515	0.9038	0.8137	0.8039	0.8447
32	0.7593	0.6058	0.7547	0.7117	0.4815
56	0.2233	0.3238	0.3540	0.4643	0.2545

Conc-%	Transform: Arcsin Square Root							1-Tailed			Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
B-Control	0.8714	1.0518	1.2059	1.1593	1.2555	3.852	5	*			0.8716	1.0000
D-Control	0.8285	1.0000	1.1449	1.0837	1.1772	3.563	5					
5.6	0.8476	1.0231	1.1709	1.1168	1.2207	3.153	5	0.732	2.360	0.1130	0.8540	0.9798
10	0.8604	1.0385	1.1896	1.1245	1.2523	3.852	5	0.340	2.360	0.1130	0.8540	0.9798
18	0.8435	1.0182	1.1666	1.1121	1.2555	4.834	5	0.821	2.360	0.1130	0.8438	0.9681
*32	0.6626	0.7998	0.9547	0.7669	1.0580	13.030	5	5.246	2.360	0.1130	0.6629	0.7606
*56	0.3240	0.3911	0.6026	0.4922	0.7497	16.690	5	12.598	2.360	0.1130	0.3260	0.3740

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.05$ )	0.9767	0.927	-0.3159	0.92229						
Bartlett's Test indicates equal variances ( $p = 0.11$ )	8.91413	15.0863								
The control means are not significantly different ( $p = 0.06$ )	2.20574	2.30601								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs B-Control	18	32	24	5.55556	0.08418	0.09646	0.28119	0.00573	8.0E-12	5, 24

Point	Linear Interpolation (200 Resamples)				
	%	SD	95% CL(Exp)	Skew	
IC05	19.218	2.774	7.980	21.885	-2.4979
IC10	22.593	1.648	19.439	27.506	0.8892
IC15	25.967	2.433	21.811	34.291	0.7565
IC20	29.342	2.793	23.696	36.571	0.1653
IC25	32.659	2.868	25.401	38.782	-0.1459
IC40	41.970	2.661	33.390	46.753	-0.6303
IC50	48.178	2.390	42.461	54.848	0.2717



**Macrocystis Germination and Growth Test-Growth-Length**

Start Date: 7/15/2008 14:00 Test ID: 8071502k Sample ID: CA0047881-Morro Bay SD  
 End Date: 7/17/2008 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 7/14/2008 09:05 Protocol: WCCH-EPA-600-R-95-136 Test Species: MP-Macrocystis pyrifera

Comments:

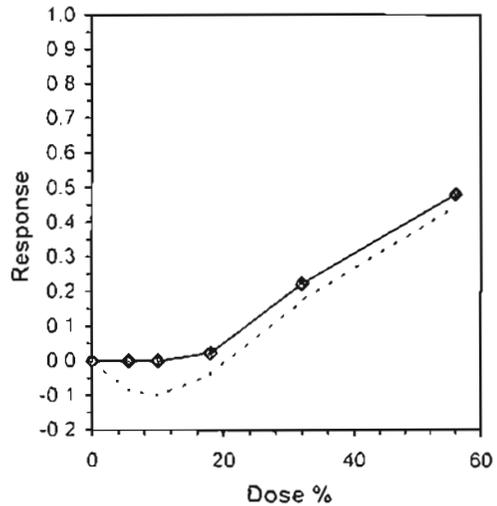
Conc-%	1	2	3	4	5
B-Control	16.250	16.250	14.750	15.750	16.000
D-Control	16.000	15.500	16.000	15.250	15.500
5.6	17.250	17.000	17.000	17.500	17.000
10	18.000	17.750	16.750	18.000	16.500
18	16.750	15.500	16.250	16.250	17.250
32	13.500	14.000	13.500	14.500	9.750
56	8.000	7.000	8.250	10.750	9.500

Conc-%	Transform: Untransformed							Rank Sum	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N			Mean	N-Mean
B-Control	15.800	1.0096	15.800	14.750	16.250	3.940	5			16.783	1.0000
D-Control	15.650	1.0000	15.650	15.250	16.000	2.143	5				
5.6	17.150	1.0958	17.150	17.000	17.500	1.304	5	40.00	16.00	16.783	1.0000
10	17.400	1.1118	17.400	16.500	18.000	4.139	5	40.00	16.00	16.783	1.0000
18	16.400	1.0479	16.400	15.500	17.250	3.975	5	34.00	16.00	16.400	0.9772
*32	13.050	0.8339	13.050	9.750	14.500	14.489	5	15.00	16.00	13.050	0.7776
*56	8.700	0.5559	8.700	7.000	10.750	16.682	5	15.00	16.00	8.700	0.5184

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.92229	0.927	-1.1378	3.55709
Bartlett's Test indicates unequal variances (p = 6.58E-03)	16.0957	15.0863		
The control means are not significantly different (p = 0.65)	0.47434	2.30601		
<b>Hypothesis Test (1-tail, 0.05)</b>	<b>NOEC</b>	<b>LOEC</b>	<b>ChV</b>	<b>TU</b>
Steel's Many-One Rank Test	18	32	24	5.55556

Treatments vs B-Control

Point	Linear Interpolation (200 Resamples)				
	%	SD	95% CL(Exp)		Skew
IC05	19.905	1.216	15.824	22.646	-0.6218
IC10	23.412	1.463	20.233	27.379	0.0468
IC15	26.919	2.118	22.322	32.616	0.0953
IC20	30.426	2.623	24.407	36.813	-0.1004
IC25	34.552	3.089	26.308	40.901	-0.4376
IC40	48.441				
IC50	>56				



**GIANT KELP GERMINATION  
AND GROWTH  
SHORT-TERM TOXICITY TEST**



Lab No.: A-08071502-002

Start Date: 07/15/2008

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
1	32	108	82	26	5	7	5	6	4	7	5	5	6	4
2	B	104	94	10	7	7	7	8	4	7	7	5	6	7
3	18	101	86	15	8	8	6	7	7	6	7	5	7	6
4	5.6	102	90	12	7	8	8	6	7	5	6	7	7	8
5	56	103	23	80	3	4	2	2	4	3	5	4	3	2
6	10	102	92	10	7	8	4	6	7	8	9	8	8	7
7	C	101	82	19	6	7	7	6	5	7	6	6	7	7
8	5.6	102	87	15	7	8	7	7	6	7	7	6	7	6
9	18	104	94	10	6	6	7	5	6	7	7	6	7	5
10	C	102	87	15	6	7	5	7	7	5	7	6	7	5
11	10	102	88	14	8	8	4	8	7	7	6	8	7	8
12	B	102	86	16	7	6	7	7	5	7	4	7	8	7
13	32	104	63	41	6	7	5	7	6	4	4	6	5	6
14	56	105	34	71	3	3	4	2	2	3	4	2	2	3
15	B	102	92	10	7	5	5	7	6	4	7	7	6	5
16	10	107	93	14	6	7	7	8	7	7	4	6	7	8
17	C	107	91	16	6	6	7	7	7	5	6	7	7	6
18	56	113	40	73	4	3	2	2	4	5	4	3	2	4
19	18	102	83	19	8	7	6	7	5	4	8	7	7	6
20	5.6	104	88	16	7	6	8	8	7	7	6	7	5	7

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

**GIANT KELP GERMINATION  
AND GROWTH  
SHORT-TERM TOXICITY TEST**



Lab No.: A-08071502-002

Start Date: 07/15/2008

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
21	32	106	80	26	5	7	6	4	6	7	6	4	4	5
22	C	104	88	16	6	5	7	6	5	7	7	7	6	5
23	5.6	104	84	20	8	8	7	6	8	7	5	6	7	8
24	18	102	82	20	7	6	7	7	5	7	7	6	6	7
25	B	106	92	14	7	6	5	7	7	6	5	7	7	6
26	56	112	52	60	5	4	6	4	5	4	5	3	3	4
27	10	103	88	15	8	7	6	7	8	7	8	8	7	6
28	32	111	79	32	4	7	6	6	7	5	7	6	5	5
29	B	100	84	16	7	7	7	5	6	7	7	6	5	7
30	10	102	83	19	6	5	5	7	6	8	7	7	8	7
31	C	105	82	23	5	7	8	4	5	6	6	7	7	7
32	18	103	87	16	6	7	7	8	6	7	7	6	7	8
33	5.6	106	90	16	8	6	7	7	5	7	7	6	7	8
34	32	108	52	56	5	4	5	7	2	2	3	4	3	4
35	56	110	28	82	3	2	3	6	6	5	4	4	3	2
36														
37														
38														
39														
40														

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



Lab No.: A-08071502-002

Client ID: MRS - Morro Bay Effluent

Start Date: 07/15/2008

## WATER QUALITY READINGS

Sample	Initial Readings				Final Readings			
	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.8	7.4	8.1	34	15.5	7.6	8.1	34
Brine Control	15.7	7.4	8.2	34	15.3	7.7	8.0	34
5.6%	15.6	7.3	8.2	34	15.2	7.5	8.0	34
10%	15.7	7.5	8.2	34	14.8	7.1	8.0	34
18%	15.3	7.5	8.2	34	15.4	7.0	8.0	34
32%	15.6	7.3	8.2	34	15.3	6.9	8.1	34
56%	15.8	6.9	8.2	34	15.3	6.8	8.1	34

Sample as received: Chlorine: 0.0 mg/l; pH: 7.5; Salinity: 0 ppt; Temp: 2°C;  
DO: 7.6 mg/l; NH<sub>3</sub>-N: 44 mg/l..

Brine Control contains equivalent amount of artificial sea salts as highest effluent concentration.

Initial readings: Analyst: [Signature] Date: 7-15-08 Time: 1400

Final readings: Analyst: [Signature] Date: 7-17-08 Time: 1400



**QA/QC REPORTS & CHAINS OF CUSTODY**

Date of Report: 07/17/2008

Doug Coats

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

RE: Semi-Annual Eff  
BC Work Order: 0808535

Enclosed are the results of analyses for samples received by the laboratory on 7/2/2008. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Contact Person: Tina Green  
Client Services Manager



Authorized Signature



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 07/17/2008 17:00

### Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
0808535-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	07/02/2008 14:10
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	07/02/2008 00:00
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	Composite -A.R.S.	<b>Sample Matrix:</b>	Water
	<b>Sampled By:</b>	---		
0808535-02	<b>COC Number:</b>	---	<b>Receive Date:</b>	07/02/2008 14:10
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	07/01/2008 00:00
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	Travel Blank	<b>Sample Matrix:</b>	Water
	<b>Sampled By:</b>	---		



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Volatile Organic Analysis (EPA Method 624)

BCL Sample ID: 0808535-02		Client Sample Name: Travel Blank, 7/1/2008 12:00:00AM												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals	
Benzene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Bromodichloromethane	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Bromoform	ND	ug/L	0.50	0.22	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Bromomethane	ND	ug/L	1.0	0.31	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	V11	
Carbon tetrachloride	ND	ug/L	0.50	0.089	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Chlorobenzene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Chloroethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Chloroform	ND	ug/L	0.50	0.098	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Chloromethane	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Dibromochloromethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichlorobenzene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,3-Dichlorobenzene	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,4-Dichlorobenzene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,1-Dichloroethane	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichloroethane	ND	ug/L	0.50	0.098	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,1-Dichloroethene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
1,2-Dichloropropane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.086	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Ethylbenzene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND		
Methylene chloride	0.48	ug/L	1.0	0.16	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	J	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Volatile Organic Analysis (EPA Method 624)

BCL Sample ID:	0808535-02		Client Sample Name:	Travel Blank, 7/1/2008 12:00:00AM									
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Methyl t-butyl ether	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.22	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Tetrachloroethene	ND	ug/L	0.50	0.11	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Toluene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
1,1,1-Trichloroethane	ND	ug/L	0.50	0.27	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
1,1,2-Trichloroethane	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Trichloroethene	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.13	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Vinyl chloride	ND	ug/L	0.50	0.14	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Total Xylenes	ND	ug/L	0.50	0.33	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Acrolein	ND	ug/L	20	3.7	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
Acrylonitrile	ND	ug/L	5.0	2.0	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
p- & m-Xylenes	ND	ug/L	0.50	0.21	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
o-Xylene	ND	ug/L	0.50	0.12	EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210	ND	
1,2-Dichloroethane-d4 (Surrogate)	96.1	%	76 - 114 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210		
Toluene-d8 (Surrogate)	100	%	88 - 110 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210		
4-Bromofluorobenzene (Surrogate)	96.0	%	86 - 115 (LCL - UCL)		EPA-624	07/03/08	07/03/08 13:06	MGC	MS-V7	1	BRG0210		



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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Organochlorine Pesticides and PCB's (EPA Method 608)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Aldrin	BRG0683	Matrix Spike	0807421-39	ND	0.26114	0.25000	ug/L		104		80 - 136	
		Matrix Spike Duplicate	0807421-39	ND	0.21662	0.25000	ug/L	18.3	86.6	20	80 - 136	
gamma-BHC (Lindane)	BRG0683	Matrix Spike	0807421-39	ND	0.19930	0.25000	ug/L		79.7		60 - 126	
		Matrix Spike Duplicate	0807421-39	ND	0.16955	0.25000	ug/L	16.1	67.8	24	60 - 126	
4,4'-DDT	BRG0683	Matrix Spike	0807421-39	ND	0.22936	0.25000	ug/L		91.7		61 - 128	
		Matrix Spike Duplicate	0807421-39	ND	0.19049	0.25000	ug/L	18.5	76.2	19	61 - 128	
Dieldrin	BRG0683	Matrix Spike	0807421-39	ND	0.27518	0.25000	ug/L		110		76 - 132	
		Matrix Spike Duplicate	0807421-39	ND	0.22777	0.25000	ug/L	18.8	91.1	18	76 - 132	Q02
Endrin	BRG0683	Matrix Spike	0807421-39	ND	0.47026	0.25000	ug/L		188		76 - 143	Q03
		Matrix Spike Duplicate	0807421-39	ND	0.39225	0.25000	ug/L	18.0	157	19	76 - 143	Q03
Heptachlor	BRG0683	Matrix Spike	0807421-39	ND	0.23652	0.25000	ug/L		94.6		81 - 138	V11
		Matrix Spike Duplicate	0807421-39	ND	0.20015	0.25000	ug/L	16.6	80.1	18	81 - 138	Q03,V11
TCMX (Surrogate)	BRG0683	Matrix Spike	0807421-39	ND	0.30678	0.30000	ug/L		102		72 - 129	
		Matrix Spike Duplicate	0807421-39	ND	0.26412	0.30000	ug/L		88.0		72 - 129	
Dibutyl chlorendate (Surrogate)	BRG0683	Matrix Spike	0807421-39	ND	1.1580	0.75000	ug/L		154		82 - 177	
		Matrix Spike Duplicate	0807421-39	ND	1.0098	0.75000	ug/L		135		82 - 177	



Marine Research Specialists  
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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Benzene	BRG0210	Matrix Spike	0808459-01	ND	25.970	25.000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.440	25.000	ug/L	1.9	106	20	70 - 130	
Bromodichloromethane	BRG0210	Matrix Spike	0808459-01	ND	24.810	25.000	ug/L		99.2		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.240	25.000	ug/L	1.8	101	20	70 - 130	
Bromoform	BRG0210	Matrix Spike	0808459-01	ND	24.800	25.000	ug/L		99.2		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	24.510	25.000	ug/L	1.2	98.0	20	70 - 130	
Bromomethane	BRG0210	Matrix Spike	0808459-01	ND	28.640	25.000	ug/L		115		70 - 130	V11
		Matrix Spike Duplicate	0808459-01	ND	29.270	25.000	ug/L	1.7	117	20	70 - 130	V11
Carbon tetrachloride	BRG0210	Matrix Spike	0808459-01	ND	26.140	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.300	25.000	ug/L	0	105	20	70 - 130	
Chlorobenzene	BRG0210	Matrix Spike	0808459-01	ND	26.250	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.560	25.000	ug/L	2.9	102	20	70 - 130	
Chloroethane	BRG0210	Matrix Spike	0808459-01	ND	28.040	25.000	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	27.840	25.000	ug/L	0.9	111	20	70 - 130	
Chloroform	BRG0210	Matrix Spike	0808459-01	ND	25.380	25.000	ug/L		102		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.190	25.000	ug/L	1.0	101	20	70 - 130	
Chloromethane	BRG0210	Matrix Spike	0808459-01	ND	27.690	25.000	ug/L		111		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	28.000	25.000	ug/L	0.9	112	20	70 - 130	
Dibromochloromethane	BRG0210	Matrix Spike	0808459-01	ND	25.120	25.000	ug/L		100		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.380	25.000	ug/L	2.0	102	20	70 - 130	
1,2-Dichlorobenzene	BRG0210	Matrix Spike	0808459-01	ND	26.520	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.150	25.000	ug/L	0.9	105	20	70 - 130	
1,3-Dichlorobenzene	BRG0210	Matrix Spike	0808459-01	ND	26.580	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.240	25.000	ug/L	0.9	105	20	70 - 130	
1,4-Dichlorobenzene	BRG0210	Matrix Spike	0808459-01	ND	26.350	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.800	25.000	ug/L	1.9	103	20	70 - 130	



Marine Research Specialists  
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Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits	
										RPD	Percent Recovery Lab Quals
1,1-Dichloroethane	BRG0210	Matrix Spike	0808459-01	ND	25.230	25.000	ug/L		101		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.590	25.000	ug/L	1.0	102	20	70 - 130
1,2-Dichloroethane	BRG0210	Matrix Spike	0808459-01	ND	24.890	25.000	ug/L		99.6		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.590	25.000	ug/L	2.4	102	20	70 - 130
1,1-Dichloroethene	BRG0210	Matrix Spike	0808459-01	ND	26.750	25.000	ug/L		107		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	27.240	25.000	ug/L	1.9	109	20	70 - 130
trans-1,2-Dichloroethene	BRG0210	Matrix Spike	0808459-01	ND	26.410	25.000	ug/L		106		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	27.110	25.000	ug/L	1.9	108	20	70 - 130
1,2-Dichloropropane	BRG0210	Matrix Spike	0808459-01	ND	25.650	25.000	ug/L		103		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	26.330	25.000	ug/L	1.9	105	20	70 - 130
cis-1,3-Dichloropropene	BRG0210	Matrix Spike	0808459-01	ND	25.490	25.000	ug/L		102		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.950	25.000	ug/L	1.9	104	20	70 - 130
trans-1,3-Dichloropropene	BRG0210	Matrix Spike	0808459-01	ND	25.620	25.000	ug/L		102		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.650	25.000	ug/L	1.0	103	20	70 - 130
Ethylbenzene	BRG0210	Matrix Spike	0808459-01	ND	26.430	25.000	ug/L		106		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.080	25.000	ug/L	5.8	100	20	70 - 130
Methylene chloride	BRG0210	Matrix Spike	0808459-01	ND	24.870	25.000	ug/L		99.5		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	24.820	25.000	ug/L	0.2	99.3	20	70 - 130
Methyl t-butyl ether	BRG0210	Matrix Spike	0808459-01	ND	23.250	25.000	ug/L		93.0		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	23.740	25.000	ug/L	2.1	95.0	20	70 - 130
1,1,2,2-Tetrachloroethane	BRG0210	Matrix Spike	0808459-01	ND	24.550	25.000	ug/L		98.2		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	24.420	25.000	ug/L	0.5	97.7	20	70 - 130
Tetrachloroethene	BRG0210	Matrix Spike	0808459-01	ND	25.750	25.000	ug/L		103		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	25.520	25.000	ug/L	1.0	102	20	70 - 130
Toluene	BRG0210	Matrix Spike	0808459-01	ND	25.700	25.000	ug/L		103		70 - 130
		Matrix Spike Duplicate	0808459-01	ND	26.260	25.000	ug/L	1.9	105	20	70 - 130



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## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
1,1,1-Trichloroethane	BRG0210	Matrix Spike	0808459-01	ND	25.900	25.000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.340	25.000	ug/L	1.0	105	20	70 - 130	
1,1,2-Trichloroethane	BRG0210	Matrix Spike	0808459-01	ND	24.620	25.000	ug/L		98.5		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.170	25.000	ug/L	2.5	101	20	70 - 130	
Trichloroethene	BRG0210	Matrix Spike	0808459-01	ND	25.860	25.000	ug/L		103		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	26.520	25.000	ug/L	2.9	106	20	70 - 130	
Trichlorofluoromethane	BRG0210	Matrix Spike	0808459-01	ND	28.090	25.000	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	27.610	25.000	ug/L	1.8	110	20	70 - 130	
1,1,2-Trichloro-1,2,2-trifluoroethane	BRG0210	Matrix Spike	0808459-01	ND	22.600	25.000	ug/L		90.4		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	22.460	25.000	ug/L	0.7	89.8	20	70 - 130	
Vinyl chloride	BRG0210	Matrix Spike	0808459-01	ND	28.530	25.000	ug/L		114		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	28.390	25.000	ug/L	0	114	20	70 - 130	
Total Xylenes	BRG0210	Matrix Spike	0808459-01	ND	75.600	75.000	ug/L		101		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	74.620	75.000	ug/L	1.5	99.5	20	70 - 130	
p- & m-Xylenes	BRG0210	Matrix Spike	0808459-01	ND	49.840	50.000	ug/L		99.7		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	48.840	50.000	ug/L	2.0	97.7	20	70 - 130	
o-Xylene	BRG0210	Matrix Spike	0808459-01	ND	25.760	25.000	ug/L		103		70 - 130	
		Matrix Spike Duplicate	0808459-01	ND	25.780	25.000	ug/L	0	103	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	BRG0210	Matrix Spike	0808459-01	ND	9.6400	10.000	ug/L		96.4		76 - 114	
		Matrix Spike Duplicate	0808459-01	ND	9.5800	10.000	ug/L		95.8		76 - 114	
Toluene-d8 (Surrogate)	BRG0210	Matrix Spike	0808459-01	ND	9.7400	10.000	ug/L		97.4		88 - 110	
		Matrix Spike Duplicate	0808459-01	ND	9.8500	10.000	ug/L		98.5		88 - 110	
4-Bromofluorobenzene (Surrogate)	BRG0210	Matrix Spike	0808459-01	ND	10.050	10.000	ug/L		100		86 - 115	
		Matrix Spike Duplicate	0808459-01	ND	9.8700	10.000	ug/L		98.7		86 - 115	



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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Acenaphthene	BRG0694	Matrix Spike	0807421-41	ND	45.635	50.000	ug/L		91.3		0 - 154	
		Matrix Spike Duplicate	0807421-41	ND	40.807	50.000	ug/L	11.2	81.6	30	0 - 154	
1,4-Dichlorobenzene	BRG0694	Matrix Spike	0807421-41	ND	36.530	50.000	ug/L		73.1		44 - 103	
		Matrix Spike Duplicate	0807421-41	ND	32.684	50.000	ug/L	11.1	65.4	30	44 - 103	
2,4-Dinitrotoluene	BRG0694	Matrix Spike	0807421-41	ND	39.271	50.000	ug/L		78.5		36 - 114	
		Matrix Spike Duplicate	0807421-41	ND	34.694	50.000	ug/L	12.3	69.4	30	36 - 114	
Hexachlorobenzene	BRG0694	Matrix Spike	0807421-41	ND	34.100	50.000	ug/L		68.2		41 - 106	
		Matrix Spike Duplicate	0807421-41	ND	32.320	50.000	ug/L	5.4	64.6	30	41 - 106	
Hexachlorobutadiene	BRG0694	Matrix Spike	0807421-41	ND	31.053	50.000	ug/L		62.1		31 - 90	
		Matrix Spike Duplicate	0807421-41	ND	27.475	50.000	ug/L	12.1	55.0	30	31 - 90	
Hexachloroethane	BRG0694	Matrix Spike	0807421-41	ND	36.109	50.000	ug/L		72.2		40 - 103	
		Matrix Spike Duplicate	0807421-41	ND	32.458	50.000	ug/L	10.6	64.9	30	40 - 103	
Nitrobenzene	BRG0694	Matrix Spike	0807421-41	ND	36.596	50.000	ug/L		73.2		44 - 106	
		Matrix Spike Duplicate	0807421-41	ND	33.077	50.000	ug/L	10.0	66.2	30	44 - 106	
N-Nitrosodi-N-propylamine	BRG0694	Matrix Spike	0807421-41	ND	31.663	50.000	ug/L		63.3		35 - 103	
		Matrix Spike Duplicate	0807421-41	ND	31.500	50.000	ug/L	0.5	63.0	30	35 - 103	
Pyrene	BRG0694	Matrix Spike	0807421-41	ND	61.831	50.000	ug/L		124		28 - 120	Q03
		Matrix Spike Duplicate	0807421-41	ND	54.491	50.000	ug/L	12.9	109	30	28 - 120	
1,2,4-Trichlorobenzene	BRG0694	Matrix Spike	0807421-41	ND	35.837	50.000	ug/L		71.7		38 - 101	
		Matrix Spike Duplicate	0807421-41	ND	31.032	50.000	ug/L	14.3	62.1	30	38 - 101	
4-Chloro-3-methylphenol	BRG0694	Matrix Spike	0807421-41	ND	45.810	50.000	ug/L		91.6		25 - 139	
		Matrix Spike Duplicate	0807421-41	ND	40.903	50.000	ug/L	11.3	81.8	30	25 - 139	
2-Chlorophenol	BRG0694	Matrix Spike	0807421-41	ND	36.398	50.000	ug/L		72.8		42 - 113	
		Matrix Spike Duplicate	0807421-41	ND	32.839	50.000	ug/L	10.3	65.7	30	42 - 113	
2-Methylphenol	BRG0694	Matrix Spike	0807421-41	ND	35.169	50.000	ug/L		70.3		5 - 128	
		Matrix Spike Duplicate	0807421-41	ND	32.530	50.000	ug/L	7.7	65.1	30	5 - 128	



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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
3- & 4-Methylphenol	BRG0694	Matrix Spike	0807421-41	ND	64.507	50.000	ug/L		129		3 - 212	
		Matrix Spike Duplicate	0807421-41	ND	59.078	50.000	ug/L	8.9	118	30	3 - 212	
4-Nitrophenol	BRG0694	Matrix Spike	0807421-41	ND	22.334	50.000	ug/L		44.7		0 - 99	
		Matrix Spike Duplicate	0807421-41	ND	19.264	50.000	ug/L	14.9	38.5	30	0 - 99	
Pentachlorophenol	BRG0694	Matrix Spike	0807421-41	ND	39.129	50.000	ug/L		78.3		25 - 136	
		Matrix Spike Duplicate	0807421-41	ND	35.086	50.000	ug/L	10.9	70.2	30	25 - 136	
Phenol	BRG0694	Matrix Spike	0807421-41	ND	17.831	50.000	ug/L		35.7		14 - 63	
		Matrix Spike Duplicate	0807421-41	ND	16.774	50.000	ug/L	6.4	33.5	30	14 - 63	
2,4,6-Trichlorophenol	BRG0694	Matrix Spike	0807421-41	ND	46.310	50.000	ug/L		92.6		45 - 123	
		Matrix Spike Duplicate	0807421-41	ND	38.942	50.000	ug/L	17.2	77.9	30	45 - 123	
2-Fluorophenol (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	39.980	80.000	ug/L		50.0		26 - 92	
		Matrix Spike Duplicate	0807421-41	ND	38.620	80.000	ug/L		48.3		26 - 92	
Phenol-d5 (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	27.920	80.000	ug/L		34.9		11 - 70	
		Matrix Spike Duplicate	0807421-41	ND	25.670	80.000	ug/L		32.1		11 - 70	
Nitrobenzene-d5 (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	60.950	80.000	ug/L		76.2		47 - 121	
		Matrix Spike Duplicate	0807421-41	ND	58.560	80.000	ug/L		73.2		47 - 121	
2-Fluorobiphenyl (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	61.970	80.000	ug/L		77.5		43 - 111	
		Matrix Spike Duplicate	0807421-41	ND	55.250	80.000	ug/L		69.1		43 - 111	
2,4,6-Tribromophenol (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	59.870	80.000	ug/L		74.8		44 - 124	
		Matrix Spike Duplicate	0807421-41	ND	52.670	80.000	ug/L		65.8		44 - 124	
p-Terphenyl-d14 (Surrogate)	BRG0694	Matrix Spike	0807421-41	ND	37.890	40.000	ug/L		94.7		46 - 102	
		Matrix Spike Duplicate	0807421-41	ND	32.010	40.000	ug/L		80.0		46 - 102	



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## Organo-Phosphorus Pesticide Analysis (EPA Method 8140)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Bolstar	BRG0590	Matrix Spike	0807421-30	ND	0.76000	1.0000	ug/L		76.0		48 - 117	
		Matrix Spike Duplicate	0807421-30	ND	0.78000	1.0000	ug/L	2.6	78.0	30	48 - 117	
Chlorpyrifos	BRG0590	Matrix Spike	0807421-30	ND	0.85500	1.0000	ug/L		85.5		30 - 141	
		Matrix Spike Duplicate	0807421-30	ND	0.87000	1.0000	ug/L	1.7	87.0	30	30 - 141	
Diazinon	BRG0590	Matrix Spike	0807421-30	ND	0.84500	1.0000	ug/L		84.5		53 - 138	
		Matrix Spike Duplicate	0807421-30	ND	0.87500	1.0000	ug/L	3.5	87.5	27	53 - 138	
Methyl parathion	BRG0590	Matrix Spike	0807421-30	ND	0.82500	1.0000	ug/L		82.5		43 - 136	
		Matrix Spike Duplicate	0807421-30	ND	0.86000	1.0000	ug/L	4.2	86.0	30	43 - 136	
Mevinphos	BRG0590	Matrix Spike	0807421-30	ND	0.77000	1.0000	ug/L		77.0		54 - 148	
		Matrix Spike Duplicate	0807421-30	ND	0.79500	1.0000	ug/L	3.2	79.5	30	54 - 148	
Ronnel (Fenclorphos)	BRG0590	Matrix Spike	0807421-30	ND	0.76500	1.0000	ug/L		76.5		20 - 150	
		Matrix Spike Duplicate	0807421-30	ND	0.82000	1.0000	ug/L	6.9	82.0	30	20 - 150	
Stirophos (Tetrachlorvinphos)	BRG0590	Matrix Spike	0807421-30	ND	0.68500	1.0000	ug/L		68.5		51 - 151	
		Matrix Spike Duplicate	0807421-30	ND	0.77500	1.0000	ug/L	12.3	77.5	30	51 - 151	
Triphenylphosphate (Surrogate)	BRG0590	Matrix Spike	0807421-30	ND	2.0600	2.5000	ug/L		82.4		55 - 132	
		Matrix Spike Duplicate	0807421-30	ND	2.0950	2.5000	ug/L		83.8		55 - 132	



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## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Total Cyanide	BRG0382	Duplicate	0808410-01	ND	ND		mg/L			10		
		Matrix Spike	0808410-01	ND	0.12051	0.10000	mg/L		121		90 - 110	Q03
		Matrix Spike Duplicate	0808410-01	ND	0.12100	0.10000	mg/L	0	121	20	90 - 110	Q03



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## Water Analysis (Metals)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Total Antimony	BRG0358	Duplicate	0808538-01	ND	ND		ug/L			20		
		Matrix Spike	0808538-01	ND	382.87	400.00	ug/L		95.7		75 - 125	
		Matrix Spike Duplicate	0808538-01	ND	380.49	400.00	ug/L	0.6	95.1	20	75 - 125	
Total Beryllium	BRG0358	Duplicate	0808538-01	ND	ND		ug/L			20		
		Matrix Spike	0808538-01	ND	213.94	200.00	ug/L		107		75 - 125	
		Matrix Spike Duplicate	0808538-01	ND	214.56	200.00	ug/L	0	107	20	75 - 125	
Total Cadmium	BRG0358	Duplicate	0808538-01	ND	ND		ug/L			20		
		Matrix Spike	0808538-01	ND	213.88	200.00	ug/L		107		75 - 125	
		Matrix Spike Duplicate	0808538-01	ND	215.95	200.00	ug/L	0.9	108	20	75 - 125	
Total Chromium	BRG0358	Duplicate	0808538-01	3.1094	3.2408		ug/L	4.1		20		J
		Matrix Spike	0808538-01	3.1094	217.85	200.00	ug/L		107		75 - 125	
		Matrix Spike Duplicate	0808538-01	3.1094	218.88	200.00	ug/L	0.9	108	20	75 - 125	
Total Copper	BRG0358	Duplicate	0808538-01	61.394	67.185		ug/L	9.0		20		
		Matrix Spike	0808538-01	61.394	273.35	200.00	ug/L		106		75 - 125	
		Matrix Spike Duplicate	0808538-01	61.394	275.16	200.00	ug/L	0.9	107	20	75 - 125	
Total Nickel	BRG0358	Duplicate	0808538-01	2.7845	3.3272		ug/L	17.8		20		J
		Matrix Spike	0808538-01	2.7845	444.92	400.00	ug/L		111		75 - 125	
		Matrix Spike Duplicate	0808538-01	2.7845	447.57	400.00	ug/L	0	111	20	75 - 125	
Total Silver	BRG0358	Duplicate	0808538-01	ND	ND		ug/L			20		
		Matrix Spike	0808538-01	ND	99.998	100.00	ug/L		100		75 - 125	
		Matrix Spike Duplicate	0808538-01	ND	100.45	100.00	ug/L	0	100	20	75 - 125	
Total Zinc	BRG0358	Duplicate	0808538-01	86.908	88.781		ug/L	2.1		20		
		Matrix Spike	0808538-01	86.908	314.47	200.00	ug/L		114		75 - 125	
		Matrix Spike Duplicate	0808538-01	86.908	320.87	200.00	ug/L	2.6	117	20	75 - 125	
Total Recoverable Arsenic	BRG0621	Duplicate	0808549-01	1.5210	1.9990		ug/L	27.2		20		J,A02
		Matrix Spike	0808549-01	1.5210	113.37	100.00	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0808549-01	1.5210	103.97	100.00	ug/L	9.3	102	20	70 - 130	



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## Water Analysis (Metals)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Total Recoverable Lead	BRG0621	Duplicate	0808549-01	0.34800	0.35500		ug/L	2.0		20		J
		Matrix Spike	0808549-01	0.34800	109.46	100.00	ug/L		109		70 - 130	
		Matrix Spike Duplicate	0808549-01	0.34800	105.20	100.00	ug/L	3.7	105	20	70 - 130	
Total Recoverable Selenium	BRG0621	Duplicate	0808549-01	1.6020	1.3720		ug/L	15.5		20		J
		Matrix Spike	0808549-01	1.6020	109.68	100.00	ug/L		108		70 - 130	
		Matrix Spike Duplicate	0808549-01	1.6020	100.30	100.00	ug/L	9.0	98.7	20	70 - 130	
Total Recoverable Thallium	BRG0621	Duplicate	0808549-01	ND	ND		ug/L			20		
		Matrix Spike	0808549-01	ND	43.171	40.000	ug/L		108		70 - 130	
		Matrix Spike Duplicate	0808549-01	ND	41.580	40.000	ug/L	3.8	104	20	70 - 130	
Total Mercury	BRG0729	Duplicate	0808535-01RE1	ND	ND		ug/L			20		
		Matrix Spike	0808535-01RE1	ND	1.0475	1.0000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0808535-01RE1	ND	0.98000	1.0000	ug/L	6.9	98.0	20	70 - 130	

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## Organochlorine Pesticides and PCB's (EPA Method 608)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
Aldrin	BRG0683	BRG0683-BS1	LCS	0.24373	0.25000	0.0050	ug/L	97.5		77 - 142	
gamma-BHC (Lindane)	BRG0683	BRG0683-BS1	LCS	0.18861	0.25000	0.0050	ug/L	75.4		62 - 125	
4,4'-DDT	BRG0683	BRG0683-BS1	LCS	0.21116	0.25000	0.0050	ug/L	84.5		64 - 130	
Dieldrin	BRG0683	BRG0683-BS1	LCS	0.25871	0.25000	0.0050	ug/L	103		79 - 133	
Endrin	BRG0683	BRG0683-BS1	LCS	0.44676	0.25000	0.0050	ug/L	179		82 - 139	L01
Heptachlor	BRG0683	BRG0683-BS1	LCS	0.22329	0.25000	0.0050	ug/L	89.3		76 - 143	V11
TCMX (Surrogate)	BRG0683	BRG0683-BS1	LCS	0.29505	0.30000		ug/L	98.4		72 - 129	
Dibutyl chlorendate (Surrogate)	BRG0683	BRG0683-BS1	LCS	1.0998	0.75000		ug/L	147		82 - 177	



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## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
Benzene	BRG0210	BRG0210-BS1	LCS	25.980	25.000	0.50	ug/L	104		70 - 130	
Bromodichloromethane	BRG0210	BRG0210-BS1	LCS	25.060	25.000	0.50	ug/L	100		70 - 130	
Bromoform	BRG0210	BRG0210-BS1	LCS	24.920	25.000	0.50	ug/L	99.7		70 - 130	
Bromomethane	BRG0210	BRG0210-BS1	LCS	30.240	25.000	1.0	ug/L	121		70 - 130	
Carbon tetrachloride	BRG0210	BRG0210-BS1	LCS	26.110	25.000	0.50	ug/L	104		70 - 130	
Chlorobenzene	BRG0210	BRG0210-BS1	LCS	25.480	25.000	0.50	ug/L	102		70 - 130	
Chloroethane	BRG0210	BRG0210-BS1	LCS	27.600	25.000	0.50	ug/L	110		70 - 130	
Chloroform	BRG0210	BRG0210-BS1	LCS	25.300	25.000	0.50	ug/L	101		70 - 130	
Chloromethane	BRG0210	BRG0210-BS1	LCS	28.430	25.000	0.50	ug/L	114		70 - 130	
Dibromochloromethane	BRG0210	BRG0210-BS1	LCS	25.270	25.000	0.50	ug/L	101		70 - 130	
1,2-Dichlorobenzene	BRG0210	BRG0210-BS1	LCS	25.860	25.000	0.50	ug/L	103		70 - 130	
1,3-Dichlorobenzene	BRG0210	BRG0210-BS1	LCS	26.570	25.000	0.50	ug/L	106		70 - 130	
1,4-Dichlorobenzene	BRG0210	BRG0210-BS1	LCS	26.040	25.000	0.50	ug/L	104		70 - 130	
1,1-Dichloroethane	BRG0210	BRG0210-BS1	LCS	25.750	25.000	0.50	ug/L	103		70 - 130	
1,2-Dichloroethane	BRG0210	BRG0210-BS1	LCS	25.200	25.000	0.50	ug/L	101		70 - 130	
1,1-Dichloroethene	BRG0210	BRG0210-BS1	LCS	27.220	25.000	0.50	ug/L	109		70 - 130	
trans-1,2-Dichloroethene	BRG0210	BRG0210-BS1	LCS	26.710	25.000	0.50	ug/L	107		70 - 130	
1,2-Dichloropropane	BRG0210	BRG0210-BS1	LCS	25.560	25.000	0.50	ug/L	102		70 - 130	
cis-1,3-Dichloropropene	BRG0210	BRG0210-BS1	LCS	24.860	25.000	0.50	ug/L	99.4		70 - 130	
trans-1,3-Dichloropropene	BRG0210	BRG0210-BS1	LCS	25.540	25.000	0.50	ug/L	102		70 - 130	
Ethylbenzene	BRG0210	BRG0210-BS1	LCS	24.990	25.000	0.50	ug/L	100		70 - 130	
Methylene chloride	BRG0210	BRG0210-BS1	LCS	25.460	25.000	1.0	ug/L	102		70 - 130	
Methyl t-butyl ether	BRG0210	BRG0210-BS1	LCS	23.320	25.000	0.50	ug/L	93.3		70 - 130	



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## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
1,1,2,2-Tetrachloroethane	BRG0210	BRG0210-BS1	LCS	23.440	25.000	0.50	ug/L	93.8		70 - 130	
Tetrachloroethene	BRG0210	BRG0210-BS1	LCS	25.710	25.000	0.50	ug/L	103		70 - 130	
Toluene	BRG0210	BRG0210-BS1	LCS	26.090	25.000	0.50	ug/L	104		70 - 130	
1,1,1-Trichloroethane	BRG0210	BRG0210-BS1	LCS	25.820	25.000	0.50	ug/L	103		70 - 130	
1,1,2-Trichloroethane	BRG0210	BRG0210-BS1	LCS	25.210	25.000	0.50	ug/L	101		70 - 130	
Trichloroethene	BRG0210	BRG0210-BS1	LCS	26.010	25.000	0.50	ug/L	104		70 - 130	
Trichlorofluoromethane	BRG0210	BRG0210-BS1	LCS	27.890	25.000	0.50	ug/L	112		70 - 130	
1,1,2-Trichloro-1,2,2-trifluoroethane	BRG0210	BRG0210-BS1	LCS	22.610	25.000	0.50	ug/L	90.4		70 - 130	
Vinyl chloride	BRG0210	BRG0210-BS1	LCS	28.660	25.000	0.50	ug/L	115		70 - 130	
Total Xylenes	BRG0210	BRG0210-BS1	LCS	74.850	75.000	0.50	ug/L	99.8		70 - 130	
p- & m-Xylenes	BRG0210	BRG0210-BS1	LCS	49.700	50.000	0.50	ug/L	99.4		70 - 130	
o-Xylene	BRG0210	BRG0210-BS1	LCS	25.150	25.000	0.50	ug/L	101		70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	BRG0210	BRG0210-BS1	LCS	9.4800	10.000	0.50	ug/L	94.8		76 - 114	
Toluene-d8 (Surrogate)	BRG0210	BRG0210-BS1	LCS	9.7400	10.000	0.50	ug/L	97.4		88 - 110	
4-Bromofluorobenzene (Surrogate)	BRG0210	BRG0210-BS1	LCS	9.8500	10.000	0.50	ug/L	98.5		86 - 115	



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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
Acenaphthene	BRG0694	BRG0694-BS1	LCS	37.085	50.000	2.0	ug/L	74.2		34 - 134	
1,4-Dichlorobenzene	BRG0694	BRG0694-BS1	LCS	32.619	50.000	2.0	ug/L	65.2		31 - 123	
2,4-Dinitrotoluene	BRG0694	BRG0694-BS1	LCS	31.399	50.000	2.0	ug/L	62.8		37 - 118	
Hexachlorobenzene	BRG0694	BRG0694-BS1	LCS	27.702	50.000	2.0	ug/L	55.4		36 - 121	
Hexachlorobutadiene	BRG0694	BRG0694-BS1	LCS	27.822	50.000	2.0	ug/L	55.6		25 - 102	
Hexachloroethane	BRG0694	BRG0694-BS1	LCS	31.408	50.000	2.0	ug/L	62.8		23 - 126	
Nitrobenzene	BRG0694	BRG0694-BS1	LCS	32.287	50.000	2.0	ug/L	64.6		42 - 113	
N-Nitrosodi-N-propylamine	BRG0694	BRG0694-BS1	LCS	29.967	50.000	2.0	ug/L	59.9		18 - 129	
Pyrene	BRG0694	BRG0694-BS1	LCS	45.165	50.000	2.0	ug/L	90.3		18 - 139	
1,2,4-Trichlorobenzene	BRG0694	BRG0694-BS1	LCS	31.230	50.000	2.0	ug/L	62.5		32 - 116	
4-Chloro-3-methylphenol	BRG0694	BRG0694-BS1	LCS	37.822	50.000	5.0	ug/L	75.6		29 - 149	
2-Chlorophenol	BRG0694	BRG0694-BS1	LCS	33.029	50.000	2.0	ug/L	66.1		26 - 136	
2-Methylphenol	BRG0694	BRG0694-BS1	LCS	31.686	50.000	2.0	ug/L	63.4		24 - 125	
3- & 4-Methylphenol	BRG0694	BRG0694-BS1	LCS	55.277	50.000	2.0	ug/L	111		31 - 210	
4-Nitrophenol	BRG0694	BRG0694-BS1	LCS	17.177	50.000	2.0	ug/L	34.4		0 - 95	
Pentachlorophenol	BRG0694	BRG0694-BS1	LCS	31.969	50.000	10	ug/L	63.9		29 - 142	
Phenol	BRG0694	BRG0694-BS1	LCS	15.782	50.000	2.0	ug/L	31.6		1 - 76	
2,4,6-Trichlorophenol	BRG0694	BRG0694-BS1	LCS	34.998	50.000	5.0	ug/L	70.0		35 - 142	
2-Fluorophenol (Surrogate)	BRG0694	BRG0694-BS1	LCS	36.230	80.000		ug/L	45.3		26 - 92	
Phenol-d5 (Surrogate)	BRG0694	BRG0694-BS1	LCS	24.180	80.000		ug/L	30.2		11 - 70	
Nitrobenzene-d5 (Surrogate)	BRG0694	BRG0694-BS1	LCS	56.790	80.000		ug/L	71.0		47 - 121	
2-Fluorobiphenyl (Surrogate)	BRG0694	BRG0694-BS1	LCS	53.340	80.000		ug/L	66.7		43 - 111	
2,4,6-Tribromophenol (Surrogate)	BRG0694	BRG0694-BS1	LCS	46.220	80.000		ug/L	57.8		44 - 124	

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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits		Lab Quals
										Percent Recovery	RPD	
p-Terphenyl-d14 (Surrogate)	BRG0694	BRG0694-BS1	LCS	28.180	40.000		ug/L	70.4		46 - 102		

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## Organo-Phosphorus Pesticide Analysis (EPA Method 8140)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery RPD	
Bolstar	BRG0590	BRG0590-BS1	LCS	0.89500	1.0000	0.20	ug/L	89.5		42 - 127	
Chlorpyrifos	BRG0590	BRG0590-BS1	LCS	0.93500	1.0000	0.20	ug/L	93.5		31 - 142	
Diazinon	BRG0590	BRG0590-BS1	LCS	0.94500	1.0000	0.20	ug/L	94.5		53 - 137	
Methyl parathion	BRG0590	BRG0590-BS1	LCS	0.85500	1.0000	0.20	ug/L	85.5		24 - 148	
Mevinphos	BRG0590	BRG0590-BS1	LCS	0.96500	1.0000	0.20	ug/L	96.5		46 - 140	
Ronnel (Fenclorphos)	BRG0590	BRG0590-BS1	LCS	0.88500	1.0000	0.20	ug/L	88.5		30 - 136	
Stirophos (Tetrachlorvinphos)	BRG0590	BRG0590-BS1	LCS	0.76000	1.0000	0.20	ug/L	76.0		36 - 159	
Triphenylphosphate (Surrogate)	BRG0590	BRG0590-BS1	LCS	2.2950	2.5000	0.20	ug/L	91.8		51 - 141	



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## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits		Lab Quals
										Percent Recovery	RPD	
Total Cyanide	BRG0382	BRG0382-BS1	LCS	0.16443	0.15000	0.0050	mg/L	110		90 - 110		



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## Water Analysis (Metals)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	Control Limits		Lab Quals
									RPD	Percent Recovery	
Total Antimony	BRG0358	BRG0358-BS1	LCS	384.86	400.00	100	ug/L	96.2		85 - 115	
Total Beryllium	BRG0358	BRG0358-BS1	LCS	206.88	200.00	10	ug/L	103		85 - 115	
Total Cadmium	BRG0358	BRG0358-BS1	LCS	209.63	200.00	10	ug/L	105		85 - 115	
Total Chromium	BRG0358	BRG0358-BS1	LCS	209.20	200.00	10	ug/L	105		85 - 115	
Total Copper	BRG0358	BRG0358-BS1	LCS	195.73	200.00	10	ug/L	97.9		85 - 115	
Total Nickel	BRG0358	BRG0358-BS1	LCS	434.67	400.00	10	ug/L	109		85 - 115	
Total Silver	BRG0358	BRG0358-BS1	LCS	97.051	100.00	10	ug/L	97.1		85 - 115	
Total Zinc	BRG0358	BRG0358-BS1	LCS	224.83	200.00	50	ug/L	112		85 - 115	
Total Recoverable Arsenic	BRG0621	BRG0621-BS1	LCS	103.76	100.00	2.0	ug/L	104		85 - 115	
Total Recoverable Lead	BRG0621	BRG0621-BS1	LCS	104.38	100.00	1.0	ug/L	104		85 - 115	
Total Recoverable Selenium	BRG0621	BRG0621-BS1	LCS	101.61	100.00	2.0	ug/L	102		85 - 115	
Total Recoverable Thallium	BRG0621	BRG0621-BS1	LCS	41.093	40.000	1.0	ug/L	103		85 - 115	
Total Mercury	BRG0729	BRG0729-BS1	LCS	1.0000	1.0000	0.20	ug/L	100		85 - 115	



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## Organochlorine Pesticides and PCB's (EPA Method 608)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Aldrin	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0013	
alpha-BHC	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0011	
beta-BHC	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0021	
delta-BHC	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0014	
gamma-BHC (Lindane)	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.00094	
Chlordane (Technical)	BRG0683	BRG0683-BLK1	ND	ug/L	0.50	0.38	
4,4'-DDD	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0017	
4,4'-DDE	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0019	
4,4'-DDT	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.00076	
Dieldrin	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0012	
Endosulfan I	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0016	
Endosulfan II	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0014	
Endosulfan sulfate	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0026	
Endrin	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.00082	
Endrin aldehyde	BRG0683	BRG0683-BLK1	ND	ug/L	0.010	0.0032	
Heptachlor	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0012	V11
Heptachlor epoxide	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.00099	
Methoxychlor	BRG0683	BRG0683-BLK1	ND	ug/L	0.0050	0.0011	
Toxaphene	BRG0683	BRG0683-BLK1	ND	ug/L	2.0	0.42	
PCB-1016	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.020	
PCB-1221	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.089	
PCB-1232	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.090	
PCB-1242	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.095	
PCB-1248	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.025	



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## Organochlorine Pesticides and PCB's (EPA Method 608)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
PCB-1254	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.042	
PCB-1260	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.020	
Total PCB's (Summation)	BRG0683	BRG0683-BLK1	ND	ug/L	0.20	0.10	
TCMX (Surrogate)	BRG0683	BRG0683-BLK1	99.4	%	72 - 129 (LCL - UCL)		
Dibutyl chlorendate (Surrogate)	BRG0683	BRG0683-BLK1	149	%	82 - 177 (LCL - UCL)		



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## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Benzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
Bromodichloromethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
Bromoform	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.22	
Bromomethane	BRG0210	BRG0210-BLK1	ND	ug/L	1.0	0.31	
Carbon tetrachloride	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.089	
Chlorobenzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.11	
Chloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
Chloroform	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.098	
Chloromethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.14	
Dibromochloromethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
1,2-Dichlorobenzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
1,3-Dichlorobenzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.14	
1,4-Dichlorobenzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
1,1-Dichloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.11	
1,2-Dichloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.098	
1,1-Dichloroethene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
trans-1,2-Dichloroethene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.14	
1,2-Dichloropropane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
cis-1,3-Dichloropropene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.086	
trans-1,3-Dichloropropene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.11	
Ethylbenzene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
Methylene chloride	BRG0210	BRG0210-BLK1	ND	ug/L	1.0	0.16	
Methyl t-butyl ether	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
1,1,2,2-Tetrachloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.22	

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## Volatile Organic Analysis (EPA Method 624)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Tetrachloroethene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.11	
Toluene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
1,1,1-Trichloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.27	
1,1,2-Trichloroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
Trichloroethene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
Trichlorofluoromethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.14	
1,1,2-Trichloro-1,2,2-trifluoroethane	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.13	
Vinyl chloride	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.14	
Total Xylenes	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.33	
Acrolein	BRG0210	BRG0210-BLK1	ND	ug/L	20	3.7	
Acrylonitrile	BRG0210	BRG0210-BLK1	ND	ug/L	5.0	2.0	
p- & m-Xylenes	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.21	
o-Xylene	BRG0210	BRG0210-BLK1	ND	ug/L	0.50	0.12	
1,2-Dichloroethane-d4 (Surrogate)	BRG0210	BRG0210-BLK1	99.5	%	76 - 114 (LCL - UCL)		
Toluene-d8 (Surrogate)	BRG0210	BRG0210-BLK1	98.4	%	88 - 110 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BRG0210	BRG0210-BLK1	95.4	%	86 - 115 (LCL - UCL)		



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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Acenaphthene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.48	
Acenaphthylene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.64	
Aldrin	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.80	
Aniline	BRG0694	BRG0694-BLK1	ND	ug/L	5.0	0.46	
Anthracene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.79	
Benzidine	BRG0694	BRG0694-BLK1	ND	ug/L	20	4.7	
Benzo[a]anthracene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.52	
Benzo[b]fluoranthene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.66	
Benzo[k]fluoranthene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.80	
Benzo[a]pyrene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.73	
Benzo[g,h,i]perylene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.94	
Benzoic acid	BRG0694	BRG0694-BLK1	ND	ug/L	10	6.1	
Benzyl alcohol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.67	
Benzyl butyl phthalate	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.59	
alpha-BHC	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.50	
beta-BHC	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.48	
delta-BHC	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.60	
gamma-BHC (Lindane)	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.56	
bis(2-Chloroethoxy)methane	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.58	
bis(2-Chloroethyl) ether	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.52	
bis(2-Chloroisopropyl)ether	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.73	
bis(2-Ethylhexyl)phthalate	BRG0694	BRG0694-BLK1	2.6129	ug/L	5.0	1.1	J,M03
4-Bromophenyl phenyl ether	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.69	
4-Chloroaniline	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.87	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
2-Chloronaphthalene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.50	
4-Chlorophenyl phenyl ether	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.68	
Chrysene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.73	
4,4'-DDD	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.50	
4,4'-DDE	BRG0694	BRG0694-BLK1	ND	ug/L	3.0	0.58	
4,4'-DDT	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.27	
Dibenzo[a,h]anthracene	BRG0694	BRG0694-BLK1	ND	ug/L	3.0	0.92	
Dibenzofuran	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.81	
1,2-Dichlorobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.58	
1,3-Dichlorobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.66	
1,4-Dichlorobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.53	
3,3-Dichlorobenzidine	BRG0694	BRG0694-BLK1	ND	ug/L	10	0.88	
Dieldrin	BRG0694	BRG0694-BLK1	ND	ug/L	3.0	0.52	
Diethyl phthalate	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.85	
Dimethyl phthalate	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.55	
Di-n-butyl phthalate	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.74	
2,4-Dinitrotoluene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.99	
2,6-Dinitrotoluene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.74	
Di-n-octyl phthalate	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.85	
1,2-Diphenylhydrazine	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.70	
Endosulfan I	BRG0694	BRG0694-BLK1	ND	ug/L	10	2.7	
Endosulfan II	BRG0694	BRG0694-BLK1	ND	ug/L	10	2.4	
Endosulfan sulfate	BRG0694	BRG0694-BLK1	ND	ug/L	3.0	0.58	
Endrin	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.54	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Endrin aldehyde	BRG0694	BRG0694-BLK1	ND	ug/L	10	0.86	
Fluoranthene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.70	
Fluorene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.73	
Heptachlor	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.60	
Heptachlor epoxide	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.63	
Hexachlorobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.71	
Hexachlorobutadiene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.59	
Hexachlorocyclopentadiene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.26	
Hexachloroethane	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.52	
Indeno[1,2,3-cd]pyrene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.92	
Isophorone	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.51	
2-Methylnaphthalene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.51	
Naphthalene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.62	
2-Naphthylamine	BRG0694	BRG0694-BLK1	ND	ug/L	20	6.5	
2-Nitroaniline	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.80	
3-Nitroaniline	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.82	
4-Nitroaniline	BRG0694	BRG0694-BLK1	ND	ug/L	5.0	1.1	
Nitrobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.55	
N-Nitrosodimethylamine	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.45	
N-Nitrosodi-N-propylamine	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.59	
N-Nitrosodiphenylamine	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.80	
Phenanthrene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.60	
Pyrene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.62	
1,2,4-Trichlorobenzene	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.67	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
4-Chloro-3-methylphenol	BRG0694	BRG0694-BLK1	ND	ug/L	5.0	0.67	
2-Chlorophenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.65	
2,4-Dichlorophenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.60	
2,4-Dimethylphenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.52	
4,6-Dinitro-2-methylphenol	BRG0694	BRG0694-BLK1	ND	ug/L	10	2.2	
2,4-Dinitrophenol	BRG0694	BRG0694-BLK1	ND	ug/L	10	2.4	
2-Methylphenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.57	
3- & 4-Methylphenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.83	
2-Nitrophenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.42	
4-Nitrophenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	1.7	
Pentachlorophenol	BRG0694	BRG0694-BLK1	ND	ug/L	10	0.45	
Phenol	BRG0694	BRG0694-BLK1	ND	ug/L	2.0	0.37	
2,4,5-Trichlorophenol	BRG0694	BRG0694-BLK1	ND	ug/L	5.0	0.93	
2,4,6-Trichlorophenol	BRG0694	BRG0694-BLK1	ND	ug/L	5.0	0.43	
2-Fluorophenol (Surrogate)	BRG0694	BRG0694-BLK1	54.9	%	26 - 92 (LCL - UCL)		
Phenol-d5 (Surrogate)	BRG0694	BRG0694-BLK1	38.9	%	11 - 70 (LCL - UCL)		
Nitrobenzene-d5 (Surrogate)	BRG0694	BRG0694-BLK1	89.9	%	47 - 121 (LCL - UCL)		
2-Fluorobiphenyl (Surrogate)	BRG0694	BRG0694-BLK1	80.3	%	43 - 111 (LCL - UCL)		
2,4,6-Tribromophenol (Surrogate)	BRG0694	BRG0694-BLK1	74.4	%	44 - 124 (LCL - UCL)		
p-Terphenyl-d14 (Surrogate)	BRG0694	BRG0694-BLK1	94.1	%	46 - 102 (LCL - UCL)		



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3140 Telegraph Road, Suite A  
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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/17/2008 17:00

## Organo-Phosphorus Pesticide Analysis (EPA Method 8140)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Azinphos methyl	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.055	
Bolstar	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.055	
Chlorpyrifos	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.024	
Coumaphos	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.054	
Demeton O/S	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.026	
Diazinon	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.044	
Dichlorvos	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.070	
Disulfoton	BRG0590	BRG0590-BLK1	ND	ug/L	0.50	0.039	
Ethoprop	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.025	
Fensulfothion	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.088	
Fenthion	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.033	
Merphos	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.058	
Methyl parathion	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.074	
Mevinphos	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.053	
Naled	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.072	
Phorate	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.041	
Ronnel (Fenchlorphos)	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.067	
Stirophos (Tetrachlorvinphos)	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.046	
Tokuthion (Prothiofos)	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.032	
Trichloronate	BRG0590	BRG0590-BLK1	ND	ug/L	0.20	0.038	
Triphenylphosphate (Surrogate)	BRG0590	BRG0590-BLK1	92.2	%	55 - 132 (LCL - UCL)		



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Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 07/17/2008 17:00

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Total Cyanide	BRG0382	BRG0382-BLK1	ND	mg/L	0.0050	0.0032	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
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Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 07/17/2008 17:00

## Water Analysis (Metals)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Total Antimony	BRG0358	BRG0358-BLK1	ND	ug/L	100	14	
Total Beryllium	BRG0358	BRG0358-BLK1	ND	ug/L	10	1.1	
Total Cadmium	BRG0358	BRG0358-BLK1	ND	ug/L	10	1.4	
Total Chromium	BRG0358	BRG0358-BLK1	ND	ug/L	10	2.3	
Total Copper	BRG0358	BRG0358-BLK1	5.4283	ug/L	10	1.4	J
Total Nickel	BRG0358	BRG0358-BLK1	ND	ug/L	10	2.3	
Total Silver	BRG0358	BRG0358-BLK1	ND	ug/L	10	2.5	
Total Zinc	BRG0358	BRG0358-BLK1	ND	ug/L	50	8.9	
Total Recoverable Arsenic	BRG0621	BRG0621-BLK1	ND	ug/L	2.0	0.82	
Total Recoverable Lead	BRG0621	BRG0621-BLK1	ND	ug/L	1.0	0.053	
Total Recoverable Selenium	BRG0621	BRG0621-BLK1	ND	ug/L	2.0	0.50	
Total Recoverable Thallium	BRG0621	BRG0621-BLK1	ND	ug/L	1.0	0.054	
Total Mercury	BRG0729	BRG0729-BLK1	ND	ug/L	0.20	0.016	



Marine Research Specialists  
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Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 07/17/2008 17:00

**Notes And Definitions**

- J Estimated Value (CLP Flag)
- MDL Method Detection Limit
- ND Analyte Not Detected at or above the reporting limit
- PQL Practical Quantitation Limit
- RPD Relative Percent Difference
- A02 The difference between duplicate readings is less than the PQL.
- A10 PQL's and MDL's were raised due to matrix interference.
- A17 Surrogate not reportable due to sample dilution.
- L01 The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
- M03 Analyte detected in the Method Blank at a level between the PQL and the MDL.
- Q02 Matrix spike precision is not within the control limits.
- Q03 Matrix spike recovery(s) is(are) not within the control limits.
- V11 The Continuing Calibration Verification (CCV) recovery is not within established control limits.



BC Laboratories, Inc.

# Chain of Custody Form

PLEASE COMPLETE:  
BCI QUOTE ID: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Report To: Client: Marine Research Specialist Project #: MS Rio Bay WWTP

Attn: Dr Doug Coats Project Name: \_\_\_\_\_

Street Address: 3140 Telegraph Rd St A Global ID #: \_\_\_\_\_

City, State, Zip: Ventura CA 93003 Sampler(s): \_\_\_\_\_

Phone: 805 644 1180 Fax: 805 393 3525

Email Address: Doug.Coats@mrsenv.com

Work Order #: 08-8535

### Analysis Requested

*Ag, As, Be, Cd, Cr, Cu, Ag, Ni, Pb, Zn*

*Cyanide*

*EPA 608 (EPA 605)*

*624 Acrole*

*EPA 8140/614*

*Gross Alpha/Beta*

*Asbestos*

*Pesticides/PCB 608/609*

Comments: See attached sheet for reference

Sample #	Description	Date Sampled	Time Sampled	Analysis Requested										Sample Matrix					Turnaround # of work days*	Notes								
				Ag	As	Be	Cd	Cr	Cu	Ag	Ni	Pb	Zn	Cyanide	EPA 608	624 Acrole	EPA 8140/614	Gross Alpha/Beta			Asbestos	Pesticides/PCB 608/609	Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other
-1	Composite - A.R.S.			X	X	X	X	X	X	X	X	X	X	X	X	X												

CHK BY AN DISTRIBUTION

SUB-OUT

**Billing**  Same as above

Report Drinking Waters on State Form?  Yes  No

Send Copy to State of CA?  Yes  No

Sample Disposal  Return to Client  Dispose by lab  Archive: Months \_\_\_\_\_

Special Reporting  QC  EDF  Raw Data

Client: \_\_\_\_\_ Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Attn: \_\_\_\_\_ PO#: \_\_\_\_\_

1. Relinquished By <u>Bruce Keay</u> Date <u>7/2/08</u> Time <u>1100</u>	1. Received By <u>Jay Mar</u> Date <u>7-2-08</u> Time <u>1100</u>
2. Relinquished By <u>Jay Mar</u> Date <u>7-2-08</u> Time <u>1400</u>	2. Received By <u>[Signature]</u> Date <u>7/2/08</u> Time <u>1400</u>
3. Relinquished By _____ Date _____ Time _____	3. Received By _____ Date _____ Time _____

08-8533

**Analysis Effluent Samples to be collected from the Morro Bay  
Wastewater Treatment Plant on Wednesday, July 2, 2008**

<b>Analysis</b>	<b>Sample</b>	<b>Method</b>
Level IIA QC Report concentrations that are detected above the MDL, but are below the PQL		
Ammonia as N w/ distillation	Grab	EPA-350.1
Total Chlorinated and Total Non-Chlorinated Phenolic Compounds (Report only the phenolic compounds)	Grab	EPA-625
<b>13 Metals:</b>		
Ag Silver	Composite	EPA 200.7
As Arsenic	Composite	EPA 200.8
Be Beryllium	Composite	EPA 200.7
Cd Cadmium	Composite	EPA 200.7
Cr Chromium	Composite	EPA 200.7
Cu Copper	Composite	EPA 200.7
Hg Mercury	Composite	EPA 245.1
Ni Nickel	Composite	EPA 200.7
Pb Lead	Composite	EPA 200.8
Sb Antimony	Composite	EPA 200.7
Se Selenium	Composite	EPA 200.8
Tl Thallium	Composite	EPA 200.8
Zn Zinc	Composite	EPA 200.7
Volatile Organics - Low Level Including Acrolein, Acrylonitrile, and MTBE	Composite	EPA 624/8240
Organochlorine Pesticides and PCBs	Composite	EPA 608/8080
Phenolic Compounds: Full list of base-neutral and acid-extractable congeners	Composite	EPA 625/8270
Cyanide	Composite	EPA 335.3
Organophosphorus Pesticides	Composite	EPA 614/8140
Radioactivity: Gross Alpha and Beta	Composite	SM 7110C & EPA 900.0
Asbestos	Composite	EPA 600/R-94/134-(100.2)

Invoice and Report to be sent to: Dr. Douglas A. Coats (Doug.Coats@mrsenv.com)  
 Marine Research Specialists  
 3140 Telegraph Rd., Suite A  
 Ventura, CA 93003  
 Telephone: (805) 644-1180

Samples to be collected from: Morro Bay Wastewater Treatment Plant  
 160 Atascadero Rd.  
 Morro Bay, CA 93442  
 Telephone: (805) 772-6272

Submission #: 08-8335

SHIPPING INFORMATION
Federal Express [ ] UPS [ ] Hand Delivery [ ]
BC Lab Field Service [x] Other [ ] (Specify) \_\_\_\_\_

SHIPPING CONTAINER
Ice Chest [x] None [ ]
Box [ ] Other [ ] (Specify) \_\_\_\_\_

Refrigerant: Ice [x] Blue Ice [ ] None [ ] Other [ ] Comments:

Custody Seals Ice Chest [ ] Containers [ ] None [x] Comments:
Intact? Yes [ ] No [ ] Intact? Yes [ ] No [ ]

All samples received? Yes [x] No [ ] All samples containers intact? Yes [x] No [ ] Description(s) match COC? Yes [x] No [ ]

COC Received
YES [x] NO [ ]

Emissivity: .95 Container: Qlu Thermometer ID: #48
Temperature: A 1.1 °C / C 1.2 °C

Date/Time 7-2-08
1408
Analyst Init CAM

Table with columns: SAMPLE CONTAINERS, SAMPLE NUMBERS (1-10). Rows include various sample types like QT GENERAL MINERAL, PT PE UNPRESERVED, etc. with handwritten entries in column 1.

Comments: NO time or date on COC.
Sample Numbering Completed By: JNW Date/Time: 7/2/08 1415
A = Actual / C = Corrected

08-8535

Assigned to: [Signature]

**Field Service  
Sampling Request Form**

Today's Date: 7-2-08

Client Code: \_\_\_\_\_ Project Name or #: \_\_\_\_\_

Company: Marine Research Office #: \_\_\_\_\_

Address: \_\_\_\_\_ Cell #: \_\_\_\_\_

Contact: Doug Coats Completed by: \_\_\_\_\_

Sample P/U pickup     Bottle D/O drop off     Pick up & Drop off     Sampling

Date Needed: 7-2-08 Time Needed: \_\_\_\_\_

Information: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Sampling Information:**

Quantity of Samples: \_\_\_\_\_

Matrix: \_\_\_\_\_

Supplies \_\_\_\_\_

Needed: \_\_\_\_\_

Analysis: \_\_\_\_\_

Take bottle order #: \_\_\_\_\_

Billing Charges for Courier/Field Time:

Time: \_\_\_\_\_

Miles: \_\_\_\_\_

Equipment: \_\_\_\_\_

Bottle order Delivery: \$50.00 TR

Flat Rate: \_\_\_\_\_

**Return with Chain of Custody for billing purposes.**

July 22, 2008

Marine Specialists Research  
3140 Telegraph Rd. Suite A  
Ventura, CA 93003-3238

<u>BC Lab #</u>	<u>Client ID</u>	<u>Sample Date</u>	<u>Sample Time</u>
0808535-01	Composite-A.R.S.	07/02/08	00:00

Attached are analytical results for analysis analyzed by LA Testing.

SUBCONTRACT ORDER

BC Laboratories  
0808535

320807978

SENDING LABORATORY:

BC Laboratories  
4100 Atlas Ct  
Bakersfield, CA 93308  
Phone: 661-327-4911  
Fax: 661-327-1918  
Project Manager: Tina Green

RECEIVING LABORATORY:

La Testing SLATSA  
159 Pasadena Ave.  
So. Pasadena, CA 91030  
Phone :1-800-303-0047  
Fax: (310) 830-4840

Send Invoice  
& Report to  
Project Manager

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 0808535-01-F	Water	Sampled:07/02/08 00:00		
oi100.2w Asbestos LATSA	07/17/08 17:00	07/04/08 00:00		
Containers Supplied:				EPA 600/R-94/134-(100.2)
① QFPE				

TEMPERATURE 22°C

Released By: *Christina M...* Date: 7/3/08 1330  
 Received By: SI (COURIER) Date: 7/7/2008 8:00AM

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

July 30, 2008

Marine Search Specialists  
3140 Telegraph Road, Suite A  
Ventura, Ca 93003-3238

<u>BC Lab #</u>	<u>Client ID</u>	<u>Sample Date</u>	<u>Sample Time</u>
0808535-01	Composite-A.R.S.	07/02/08	00:00

Attached are analytical results for analysis analyzed by Weck Laboratories.



Certificate of Analysis

Weck Laboratories, Inc

Radiological Parameters by APHA/EPA Methods - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
<b>Batch W8G0284 - *** DEFAULT PREP ***</b>									
<b>Blank (W8G0284-BLK1)</b>					Prepared: 07/09/08 Analyzed: 07/10/08				
Gross Alpha.....		0.00		pCi/L					
Gross Alpha counting error (+/-).....		0.419		pCi/L					
Gross Alpha MDA95.....		0.350		pCi/L					
<b>LCS (W8G0284-BS1)</b>					Prepared: 07/09/08 Analyzed: 07/10/08				
Gross Alpha.....		21.3		pCi/L	18.0	118	70-130		
<b>LCS Dup (W8G0284-BSD1)</b>					Prepared: 07/09/08 Analyzed: 07/10/08				
Gross Alpha.....		18.6		pCi/L	18.0	103	70-130	14	30
<b>Batch W8G0789 - *** DEFAULT PREP ***</b>									
<b>Blank (W8G0789-BLK1)</b>					Prepared: 07/21/08 Analyzed: 07/24/08				
Gross Beta.....		2.7		pCi/L					
Gross Beta counting error (+/-).....		0.26		pCi/L					
Gross Beta MDA95.....		0.017		pCi/L					
<b>LCS (W8G0789-BS1)</b>					Prepared: 07/21/08 Analyzed: 07/24/08				
Gross Beta.....		29		pCi/L	30.0	96	70-130		
<b>Matrix Spike (W8G0789-MS1)</b>					Source: 8071631-01 Prepared: 07/21/08 Analyzed: 07/24/08				
Gross Beta.....	4.6	29		pCi/L	30.0	80	70-130		
<b>Matrix Spike Dup (W8G0789-MSD1)</b>					Source: 8071631-01 Prepared: 07/21/08 Analyzed: 07/24/08				
Gross Beta.....	4.6	26		pCi/L	30.0	72	70-130	9	30



Certificate of Analysis



*Kim Tu*



Authorized Signature

Contact: Kim G Tu

(Project Manager)

ELAP # 1132  
LACSD # 10143  
NELAC # 04229CA

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. Weck Laboratories certifies that the test results meet all requirements of NELAC unless noted in the Case Narrative. This analytical report must be reproduced in its entirety.*

Notes:

The Chain of Custody document is part of the analytical report.

Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

ND = NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL).

Sub = Subcontracted analysis, original report enclosed.

Dil = Dilution Factor

MDL = Method Detection Limit

MDA = Minimum Detectable Activity

An Absence of Total Coliform meets the drinking water standards as established by the State of California Department of Health Services.

The Reporting Limit (RL) is referenced as laboratory's Practical Quantitation Limit (PQL).

For Potable water analysis, the Reporting Limit (RL) is referenced as Detection Limit for reporting purposes (DLRs) defined by EPA.

If sample collected by Weck Laboratories, sampled in accordance to lab SOP MIS002

Flags for Data Qualifiers:

Date of Report: 07/30/2008

Doug Coats

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

RE: Semi-Annual Eff  
BC Work Order: 0808533

Enclosed are the results of analyses for samples received by the laboratory on 7/2/2008. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Contact Person: Tina Green  
Client Services Manager



Authorized Signature



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 08/05/2008 13:32

### Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
0808533-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	07/02/2008 14:10
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	07/01/2008 00:00
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	Grab-A.R.S. Eff	<b>Sample Matrix:</b>	Water
	<b>Sampled By:</b>	---		



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 08/05/2008 13:32

## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
Ammonia as N (Distilled)	BRG0720	Duplicate	0808580-02	0.14800	0.16930		mg/L	13.4		20		
		Matrix Spike	0808580-02	0.14800	1.1189	1.0000	mg/L		97.1		80 - 120	
		Matrix Spike Duplicate	0808580-02	0.14800	1.0598	1.0000	mg/L	6.3	91.2	20	80 - 120	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 08/05/2008 13:32

## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits		Lab Quals
										Percent Recovery	RPD	
Ammonia as N (Distilled)	BRG0720	BRG0720-BS1	LCS	0.92380	1.0000	0.10	mg/L	92.4		85 - 115		



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 08/05/2008 13:32

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Ammonia as N (Distilled)	BRG0720	BRG0720-BLK1	ND	mg/L	0.10	0.050	



Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Semi-Annual Eff  
Project Number: [none]  
Project Manager: Doug Coats

**Reported:** 08/05/2008 13:32

**Notes And Definitions**

- MDL Method Detection Limit
- ND Analyte Not Detected at or above the reporting limit
- PQL Practical Quantitation Limit
- RPD Relative Percent Difference
- A01 PQL's and MDL's are raised due to sample dilution.

Date of Report: 07/24/2008

Doug Coats

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

RE: Morro Bay Oil and Grease Analysis  
BC Work Order: 0809225

Enclosed are the results of analyses for samples received by the laboratory on 7/16/2008. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Contact Person: Tina Green  
Client Services Manager



Authorized Signature

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

## Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information	
0809225-01	COC Number: --- Project Number: --- Sampling Location: --- Sampling Point: Grab Eff Sampled By: ---	Receive Date: 07/16/2008 19:50 Sampling Date: 07/08/2008 09:30 Sample Depth: --- Sample Matrix: Water
0809225-02	COC Number: --- Project Number: --- Sampling Location: --- Sampling Point: Grab Eff Sampled By: ---	Receive Date: 07/16/2008 19:50 Sampling Date: 07/15/2008 09:00 Sample Depth: --- Sample Matrix: Water
0809225-03	COC Number: --- Project Number: --- Sampling Location: --- Sampling Point: Grab Eff Sampled By: ---	Receive Date: 07/16/2008 19:50 Sampling Date: 07/16/2008 09:30 Sample Depth: --- Sample Matrix: Water

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625) Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits	
										RPD	Percent Recovery Lab Quals
4-Chloro-3-methylphenol	BRG1520	Matrix Spike	0807421-28		51.320	50.000	ug/L				25 - 139
		Matrix Spike Duplicate	0807421-28		52.276	50.000	ug/L			30	25 - 139
2-Chlorophenol	BRG1520	Matrix Spike	0807421-28		43.239	50.000	ug/L				42 - 113
		Matrix Spike Duplicate	0807421-28		43.522	50.000	ug/L			30	42 - 113
2-Methylphenol	BRG1520	Matrix Spike	0807421-28		37.545	50.000	ug/L				5 - 128
		Matrix Spike Duplicate	0807421-28		35.220	50.000	ug/L			30	5 - 128
3- & 4-Methylphenol	BRG1520	Matrix Spike	0807421-28	ND	69.068	50.000	ug/L		138		3 - 212
		Matrix Spike Duplicate	0807421-28	ND	67.932	50.000	ug/L	1.5	136	30	3 - 212
4-Nitrophenol	BRG1520	Matrix Spike	0807421-28		23.925	50.000	ug/L				0 - 99
		Matrix Spike Duplicate	0807421-28		22.336	50.000	ug/L			30	0 - 99
Pentachlorophenol	BRG1520	Matrix Spike	0807421-28		39.566	50.000	ug/L				25 - 136
		Matrix Spike Duplicate	0807421-28		37.615	50.000	ug/L			30	25 - 136
Phenol	BRG1520	Matrix Spike	0807421-28		20.131	50.000	ug/L				14 - 63
		Matrix Spike Duplicate	0807421-28		19.590	50.000	ug/L			30	14 - 63
2,4,6-Trichlorophenol	BRG1520	Matrix Spike	0807421-28		55.940	50.000	ug/L				45 - 123
		Matrix Spike Duplicate	0807421-28		51.937	50.000	ug/L			30	45 - 123
2-Fluorophenol (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	52.660	80.000	ug/L		65.8		26 - 92
		Matrix Spike Duplicate	0807421-28	ND	52.500	80.000	ug/L		65.6		26 - 92
Phenol-d5 (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	32.540	80.000	ug/L		40.7		11 - 70
		Matrix Spike Duplicate	0807421-28	ND	31.460	80.000	ug/L		39.3		11 - 70
Nitrobenzene-d5 (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	77.900	80.000	ug/L		97.4		47 - 121
		Matrix Spike Duplicate	0807421-28	ND	77.250	80.000	ug/L		96.6		47 - 121
2-Fluorobiphenyl (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	82.080	80.000	ug/L		103		43 - 111
		Matrix Spike Duplicate	0807421-28	ND	74.650	80.000	ug/L		93.3		43 - 111
2,4,6-Tribromophenol (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	57.490	80.000	ug/L		71.9		44 - 124
		Matrix Spike Duplicate	0807421-28	ND	56.100	80.000	ug/L		70.1		44 - 124

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*  
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.  
4100 Atlas Court Bakersfield, CA 93308 (661) 327-4911 FAX (661) 327-1918 [www.bclabs.com](http://www.bclabs.com)  
Certifications: California - ELAP Certification Number 1186; Nevada Administrative Code - NAC-445A

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625) Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits		Lab Quals
										RPD	Percent Recovery	
p-Terphenyl-d14 (Surrogate)	BRG1520	Matrix Spike	0807421-28	ND	49.430	40.000	ug/L		124	46 - 102	S09	
		Matrix Spike Duplicate	0807421-28	ND	46.540	40.000	ug/L		116	46 - 102	S09	

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits		Lab Quals
										Percent Recovery	RPD	
4-Chloro-3-methylphenol	BRG1520	BRG1520-BS1	LCS	53.621	50.000	5.0	ug/L	107		29 - 149		
2-Chlorophenol	BRG1520	BRG1520-BS1	LCS	45.735	50.000	2.0	ug/L	91.5		26 - 136		
2-Methylphenol	BRG1520	BRG1520-BS1	LCS	36.953	50.000	2.0	ug/L	73.9		24 - 125		
3- & 4-Methylphenol	BRG1520	BRG1520-BS1	LCS	65.577	50.000	2.0	ug/L	131		31 - 210		
4-Nitrophenol	BRG1520	BRG1520-BS1	LCS	24.153	50.000	2.0	ug/L	48.3		0 - 95		
Pentachlorophenol	BRG1520	BRG1520-BS1	LCS	43.446	50.000	10	ug/L	86.9		29 - 142		
Phenol	BRG1520	BRG1520-BS1	LCS	18.638	50.000	2.0	ug/L	37.3		1 - 76		
2,4,6-Trichlorophenol	BRG1520	BRG1520-BS1	LCS	54.107	50.000	5.0	ug/L	108		35 - 142		
2-Fluorophenol (Surrogate)	BRG1520	BRG1520-BS1	LCS	52.176	80.000		ug/L	65.2		26 - 92		
Phenol-d5 (Surrogate)	BRG1520	BRG1520-BS1	LCS	30.118	80.000		ug/L	37.6		11 - 70		
Nitrobenzene-d5 (Surrogate)	BRG1520	BRG1520-BS1	LCS	81.616	80.000		ug/L	102		47 - 121		
2-Fluorobiphenyl (Surrogate)	BRG1520	BRG1520-BS1	LCS	88.706	80.000		ug/L	111		43 - 111		
2,4,6-Tribromophenol (Surrogate)	BRG1520	BRG1520-BS1	LCS	61.876	80.000		ug/L	77.3		44 - 124		
p-Terphenyl-d14 (Surrogate)	BRG1520	BRG1520-BS1	LCS	51.633	40.000		ug/L	129		46 - 102		S09

Marine Research Specialists 3140 Telegraph Road, Suite A Suite A Ventura, CA 93003-3238	Project: Morro Bay Oil and Grease Analysis Project Number: [none] Project Manager: Doug Coats	Reported: 07/24/2008 8:54
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## Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

### Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
3- & 4-Methylphenol	BRG1520	BRG1520-BLK1	ND	ug/L	2.0	0.83	
2-Fluorophenol (Surrogate)	BRG1520	BRG1520-BLK1	67.5	%	26 - 92 (LCL - UCL)		
Phenol-d5 (Surrogate)	BRG1520	BRG1520-BLK1	39.9	%	11 - 70 (LCL - UCL)		
Nitrobenzene-d5 (Surrogate)	BRG1520	BRG1520-BLK1	106	%	47 - 121 (LCL - UCL)		
2-Fluorobiphenyl (Surrogate)	BRG1520	BRG1520-BLK1	106	%	43 - 111 (LCL - UCL)		
2,4,6-Tribromophenol (Surrogate)	BRG1520	BRG1520-BLK1	66.0	%	44 - 124 (LCL - UCL)		
p-Terphenyl-d14 (Surrogate)	BRG1520	BRG1520-BLK1	127	%	46 - 102 (LCL - UCL)		S09

Marine Research Specialists  
3140 Telegraph Road, Suite A  
Suite A  
Ventura, CA 93003-3238

Project: Morro Bay Oil and Grease Analysis  
Project Number: [none]  
Project Manager: Doug Coats

Reported: 07/24/2008 8:54

### Notes And Definitions

- J Estimated Value (CLP Flag)
- MDL Method Detection Limit
- ND Analyte Not Detected at or above the reporting limit
- PQL Practical Quantitation Limit
- RPD Relative Percent Difference
- S09 The surrogate recovery on the sample for this compound was not within the control limits.

# marine Research

## CITY OF MORRO BAY WWTP CHAIN OF CUSTODY

08-9225

Project Name: <u>MBCSD Oil &amp; Grease</u>	Date: <u>8 July 08</u>
Project Mngr: <u>Dr. Doug Coats Marine Research Specialist</u>	Page <u>1</u> of <u>1</u>
City of Morro Bay	<b>Special Instruction's:</b> Please send results to Doug Coats at Marine Research Specialist. Billing should also be sent to Dr. Coats at Marine Research Specialist 3140 Telegraph rd Suite A Ventura, Ca. 93003
160 Atascadero Rd.	
Morro Bay, Ca. 93442	
Phone # 805-772-6273	

Sample I.D.	Date	Time	Analysis Requested	Remark's
Grab EFF	8 July 08	0930	Oil & Grease	
Grab EFF	15 July 08	0900	Oil & Grease	
Grab EFF	16 July 08	0930	EPA 625	2 Bottles

CHK BY MSA

DISTRIBUTION

SUB OUT

Relinquished/ Received By:	Date	Time	Firm/City	Signature:
<u>Steve R. Allen</u>	16 July 08	12:15	City of Morro Bay	<u>Steve R. Allen</u>
<u>Jerry Alase</u>	7/16/08	12:15	BC Lab	<u>Jerry Alase</u>
<u>Jerry Alase</u>	7/16/08	1950	BC Lab	<u>Jerry Alase</u>
<u>Anthony</u>	7/16/08	1950	BC Lab	<u>Anthony</u>

Submission #: 08 225

**SHIPPING INFORMATION**

Federal Express  UPS  Hand Delivery   
 BC Lab Field Service  Other  (Specify) \_\_\_\_\_

**SHIPPING CONTAINER**

Ice Chest  None   
 Box  Other  (Specify) \_\_\_\_\_

Refrigerant: Ice  Blue Ice  None  Other  Comments: \_\_\_\_\_

Custody Seals: Ice Chest  Containers  None  Comments: \_\_\_\_\_  
 Intact? Yes  No  Intact? Yes  No

All samples received? Yes  No  All samples containers intact? Yes  No  Description(s) match COC? Yes  No

**COC Received**  
 YES  NO

Emissivity: .95 Container: GTP Thermometer ID: 48  
 Temperature: A 2.2 °C / C 2.3 °C

Date/Time 7-16-8 2000  
 Analyst Init ALW

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PTA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:  
 Sample Numbering Completed By: ALW Date/Time: 7-16-8 2255  
 A = Actual / C = Corrected

Submission #: A809225

SHIPPING INFORMATION

Federal Express  UPS  Hand Delivery   
BC Lab Field Service  Other  (Specify) \_\_\_\_\_

SHIPPING CONTAINER

Ice Chest  None   
Box  Other  (Specify) \_\_\_\_\_

Refrigerant: Ice  Blue Ice  None  Other  Comments: \_\_\_\_\_

Custody Seals Ice Chest  Containers  None  Comments: \_\_\_\_\_

Intact? Yes  No

Intact? Yes  No

All samples received? Yes  No  All samples containers intact? Yes  No  Description(s) match COC? Yes  No

COC Received

YES  NO

Emissivity: 95 Container: QIP Thermometer ID: 48

Date/Time 7-16-8 2008

Temperature: A 3.3 °C / C 3.4 °C

Analyst Init AW

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PTa PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1		A	B							
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments: \_\_\_\_\_  
Sample Numbering Completed By: AW Date/Time: 7-16-8 2255

A = Actual / C = Corrected

July 11, 2008

**Vista Project I.D.: 30633**

Dr. Douglas A. Coats  
Marine Research Specialists  
3140 Telegraph Rd., Ste A  
Ventura, CA 93003-3238

Dear Dr. Coats,

Enclosed are the results for one of the three aqueous samples received at Vista Analytical Laboratory on July 03, 2008 under your Project Name "Morro Bay WWTP". This sample was extracted and analyzed using EPA Method 8280 for tetra-through-octa chlorinated dioxins and furans. A standard turnaround time was provided for this work. As requested, samples "Comp Inf #1" and "Travel Blank" were placed on hold.

The following report consists of a Sample Inventory (Section I), Analytical Results (Section II) and the Appendix, which contains the chain-of-custody, a list of data qualifiers and abbreviations, Vista's current certifications, and copies of the raw data (if requested).

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com). Thank you for choosing Vista as part of your analytical support team.

Sincerely,



Martha M. Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAC for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista Analytical Laboratory.*



**Section I: Sample Inventory Report****Date Received:** 7/3/2008

<u>Vista Lab. ID</u>	<u>Client Sample ID</u>
30633-001	COMP EFF #1
30633-002	COMP INF #1
30633-003	TRAVEL BLANK

## SECTION II

Method Blank					EPA Method 8280				
Matrix:	Effluent	QC Batch No.:	1288	Lab Sample:	0-MB001	Date Analyzed DB-5:	9-Jul-08	Date Analyzed DB-225:	NA
Sample Size:	1.00 L	Date Extracted:	8-Jul-08						
Analyte	Conc. (ng/L)	DL <sup>a</sup>	EMPC <sup>b</sup>	Qualifiers	Labeled Standard	%R	LCL-UCL <sup>d</sup>	Qualifiers	
2,3,7,8-TCDD	ND	0.0155			<u>IS</u> 13C-2,3,7,8-TCDD	71.9	25 - 150		
1,2,3,7,8-PeCDD	ND	0.0123			13C-1,2,3,7,8-PeCDD	44.2	25 - 150		
1,2,3,4,7,8-HxCDD	ND	0.0222			13C-1,2,3,4,7,8-HxCDD	72.4	25 - 150		
1,2,3,6,7,8-HxCDD	ND	0.0250			13C-1,2,3,6,7,8-HxCDD	72.5	25 - 150		
1,2,3,7,8,9-HxCDD	ND	0.0237			13C-1,2,3,4,6,7,8-HpCDD	78.8	25 - 150		
1,2,3,4,6,7,8-HpCDD	ND	0.0231			13C-OCDD	66.4	25 - 150		
OCDD	ND	0.0219			13C-2,3,7,8-TCDF	79.3	25 - 150		
2,3,7,8-TCDF	ND	0.00836			13C-1,2,3,7,8-PeCDF	49.0	25 - 150		
1,2,3,7,8-PeCDF	ND	0.0160			13C-2,3,4,7,8-PeCDF	51.3	25 - 150		
2,3,4,7,8-PeCDF	ND	0.0153			13C-1,2,3,4,7,8-HxCDF	69.2	25 - 150		
1,2,3,4,7,8-HxCDF	ND	0.00892			13C-1,2,3,6,7,8-HxCDF	86.0	25 - 150		
1,2,3,6,7,8-HxCDF	ND	0.00737			13C-2,3,4,6,7,8-HxCDF	81.0	25 - 150		
2,3,4,6,7,8-HxCDF	ND	0.00915			13C-1,2,3,7,8,9-HxCDF	78.1	25 - 150		
1,2,3,7,8,9-HxCDF	ND	0.0121			13C-1,2,3,4,6,7,8-HpCDF	87.3	25 - 150		
1,2,3,4,6,7,8-HpCDF	ND	0.0131			13C-1,2,3,4,7,8,9-HpCDF	90.1	25 - 150		
1,2,3,4,7,8,9-HpCDF	ND	0.0129			13C-OCDF	75.5	25 - 150		
OCDF	ND	0.0164			<u>CRS</u> 37Cl-2,3,7,8-TCDD	86.6	25 - 150		
<b>Totals</b>					<b>Toxic Equivalent Quotient (TEQ) Data<sup>e</sup></b>				
Total TCDD	ND	0.0155			<b>TEQ (Min):</b>	<b>0</b>			
Total PeCDD	ND	0.0218							
Total HxCDD	ND	0.0236							
Total HpCDD	ND	0.0231							
Total TCDF	ND	0.00836							
Total PeCDF	ND	0.0156							
Total HxCDF	ND	0.00919							
Total HpCDF	ND	0.0130							

Analyst: MAS

Approved By: William J. Luksemburg 11-Jul-2008 15:26

OPR Results				EPA Method 8280			
Matrix:	Effluent	QC Batch No.:	1288	Lab Sample:	0-OPR001		
Sample Size:	1.00 L	Date Extracted:	8-Jul-08	Date Analyzed DB-5:	9-Jul-08	Date Analyzed DB-225:	NA
Analyte	Spike Conc.	Conc. (ng/mL)	OPR Limits	Labeled Standard	%R	LCL-UCL	Qualifier
2,3,7,8-TCDD	10.0	9.76	7 - 13	<u>IS</u> 13C-2,3,7,8-TCDD	80.3	25 - 150	
1,2,3,7,8-PeCDD	10.0	10.6	7 - 13	13C-1,2,3,7,8-PeCDD	45.0	25 - 150	
1,2,3,4,7,8-HxCDD	25.0	28.0	17.5 - 32.5	13C-1,2,3,4,7,8-HxCDD	76.7	25 - 150	
1,2,3,6,7,8-HxCDD	25.0	25.6	17.5 - 32.5	13C-1,2,3,6,7,8-HxCDD	82.8	25 - 150	
1,2,3,7,8,9-HxCDD	25.0	27.1	17.5 - 32.5	13C-1,2,3,4,6,7,8-HpCDD	83.3	25 - 150	
1,2,3,4,6,7,8-HpCDD	25.0	27.8	17.5 - 32.5	13C-OCDD	61.6	25 - 150	
OCDD	50.0	56.9	35 - 65	13C-2,3,7,8-TCDF	84.5	25 - 150	
2,3,7,8-TCDF	10.0	10.5	7 - 13	13C-1,2,3,7,8-PeCDF	56.8	25 - 150	
1,2,3,7,8-PeCDF	10.0	11.8	7 - 13	13C-2,3,4,7,8-PeCDF	50.5	25 - 150	
2,3,4,7,8-PeCDF	10.0	11.6	7 - 13	13C-1,2,3,4,7,8-HxCDF	73.2	25 - 150	
1,2,3,4,7,8-HxCDF	25.0	30.2	17.5 - 32.5	13C-1,2,3,6,7,8-HxCDF	90.3	25 - 150	
1,2,3,6,7,8-HxCDF	25.0	28.1	17.5 - 32.5	13C-2,3,4,6,7,8-HxCDF	84.6	25 - 150	
2,3,4,6,7,8-HxCDF	25.0	29.6	17.5 - 32.5	13C-1,2,3,7,8,9-HxCDF	83.6	25 - 150	
1,2,3,7,8,9-HxCDF	25.0	28.2	17.5 - 32.5	13C-1,2,3,4,6,7,8-HpCDF	91.7	25 - 150	
1,2,3,4,6,7,8-HpCDF	25.0	29.5	17.5 - 32.5	13C-1,2,3,4,7,8,9-HpCDF	97.9	25 - 150	
1,2,3,4,7,8,9-HpCDF	25.0	29.0	17.5 - 32.5	13C-OCDF	69.0	25 - 150	
OCDF	50.0	57.7	35 - 65	<u>CRS</u> 37Cl-2,3,7,8-TCDD	87.5	25 - 150	

Analyst: MAS

Approved By: William J. Luksemburg 11-Jul-2008 15:26

## APPENDIX

## DATA QUALIFIERS & ABBREVIATIONS

<b>B</b>	<b>This compound was also detected in the method blank.</b>
<b>D</b>	<b>Dilution</b>
<b>E</b>	<b>The amount detected is above the High Calibration Limit.</b>
<b>P</b>	<b>The amount reported is the maximum possible concentration due to possible chlorinated diphenylether interference.</b>
<b>H</b>	<b>The signal-to-noise ratio is greater than 10:1.</b>
<b>I</b>	<b>Chemical Interference</b>
<b>J</b>	<b>The amount detected is below the Low Calibration Limit.</b>
<b>*</b>	<b>See Cover Letter</b>
<b>Conc.</b>	<b>Concentration</b>
<b>DL</b>	<b>Sample-specific estimated detection limit</b>
<b>MDL</b>	<b>The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero in the matrix tested.</b>
<b>EMPC</b>	<b>Estimated Maximum Possible Concentration</b>
<b>NA</b>	<b>Not applicable</b>
<b>RL</b>	<b>Reporting Limit – concentrations that correspond to low calibration point</b>
<b>ND</b>	<b>Not Detected</b>
<b>TEQ</b>	<b>Toxic Equivalency</b>

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

## CERTIFICATIONS

<b>Accrediting Authority</b>	<b>Certificate Number</b>
State of Alaska, DEC	CA413-2008
State of Arizona	AZ0639
State of Arkansas, DEQ	08-043-0
State of Arkansas, DOH	Reciprocity through CA
State of California – NELAP Primary AA	02102CA
State of Colorado	N/A
State of Connecticut	PH-0182
State of Florida, DEP	E87777
State of Indiana Department of Health	C-CA-02
Commonwealth of Kentucky	90063
State of Louisiana, Health and Hospitals	LA08000
State of Louisiana, DEQ	01977
State of Maine	2008024
State of Michigan	9932
State of Mississippi	Reciprocity through CA
Naval Facilities Engineering Service Center	NFESC413
State of Nevada	CA004132007A
State of New Jersey	CA003
State of New Mexico	Reciprocity through CA
State of New York, DOH	11411
State of North Carolina	06700
State of North Dakota, DOH	R-078
State of Oklahoma	D9919
State of Oregon	CA200001-006
State of Pennsylvania	68-00490
State of South Carolina	87002001
State of Tennessee	TN02996
State of Texas	T104704189-08-TX
U.S. Army Corps of Engineers	N/A
State of Utah	CA16400
Commonwealth of Virginia	00013
State of Washington	C1285
State of Wisconsin	998036160
State of Wyoming	8TMS-Q



SAMPLE LOG-IN CHECKLIST



Vista Project #: 30633

TAT Standard

Samples Arrival:	Date/Time <u>7/3/08 1026</u>	Initials: <u>UBSB</u>	Location: <u>WR-2</u>
Logged In:	Date/Time <u>7/3/08 1115</u>	Initials: <u>UBSB</u>	Location: <u>WR-2</u>
Delivered By:	<u>FedEx</u> UPS Cal DHL Hand Delivered Other		
Preservation:	<u>Ice</u> <u>Blue Ice</u> Dry Ice None		
Temp °C	<u>3.8°C</u>	Time: <u>1034</u>	Thermometer ID: IR-1

	YES	NO	NA
Adequate Sample Volume Received?	<input checked="" type="checkbox"/>		
Holding Time Acceptable?	<input checked="" type="checkbox"/>		
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>		
Shipping Custody Seals Intact?			<input checked="" type="checkbox"/>
Shipping Documentation Present?	<input checked="" type="checkbox"/>		
Airbill. Trk # <u>8463 7613 2829</u>	<input checked="" type="checkbox"/>		
Sample Container Intact?	<input checked="" type="checkbox"/>		
Sample Custody Seals Intact?			<input checked="" type="checkbox"/>
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>		
COC Anomaly/Sample Acceptance Form completed?		<input checked="" type="checkbox"/>	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			<input checked="" type="checkbox"/>
Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Preservation Documented?	COC	Sample Container	<u>None</u>
Shipping Container	Vista	<u>Client</u>	Retain <u>Return</u> Dispose

Comments: ID: Date: Time:

Handwritten on bottle. { COMP EFF 7/2/08 1045  
 COMP (Cap ID: CI) 7/2/08 1041 Sample on Hold  
 Travel Blank 6/24/08 0925

COC ID: Comp Eff #1  
 Comp Inf #1  
 Travel Blank



***CHAIN  
OF  
CUSTODY***

# CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant

160 Atascadero Road

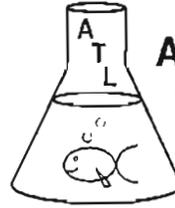
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:



**Aquatic  
Testing  
Laboratories**

4350 Transport St., Unit 107  
Ventura, CA 93003  
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	14 July 08	0900	E	0	1 (one gallon)	FHM Acute daily renewal
Comp. Eff.	14 July 08	0905	E	0	1 (one gallon)	Giant Kelp Chronic

Special Instructions: ~~Comp Eff 012 = no test~~  
Grab Eff 012 = .04 mg/L

\*\* Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.

\* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

## CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
Steven R. Aschenbrenner	Fred Ex	14 July 08	1400	Yes	—
Fred Ex	[Signature]	7-15-08	0930	NA	2°C

# CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant

160 Atascadero Road

Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:



**Aquatic  
Testing  
Laboratories**

4350 Transport St., Unit 107  
Ventura, CA 93003  
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	15 July 08	0900	E	.02	1 (one gallon)	FHM Acute daily renewal

Special Instructions:  $Cl_2 = .02 \text{ mg/l}$

\*\* Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.

\* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

## CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
Soren R. Achumbrun	Jel E	15 July 08	1430	YES	—
Jel E	Jel E	7-16-08	0900	NA	0.5

# CHAIN OF CUSTODY

Client: City of Morro Bay

---

Address: Wastewater Treatment Plant

---

160 Atascadero Road

---

Morro Bay, CA 93442

---

Project Manager: Doug Coats - MRS

---

Phone: (805) 644-1180

---

Fax: (805) 289-3935

---

Purchase Order No:



**Aquatic  
Testing  
Laboratories**

4350 Transport St., Unit 107  
Ventura, CA 93003  
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	16 July 08	0900	E	0.02	1 (one gallon)	FHM Acute daily renewal

**Special Instructions:**

\*\* Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.

\* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

## CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
<i>Steven R. Archambault</i>	<i>Fred Ex</i>	16 July 08	1430	Yes	—
<i>Fred Ex</i>	<i>[Signature]</i>	7-17-8	0930	NA	12.50

# CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant

160 Atascadero Road

Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:



**Aquatic  
Testing  
Laboratories**

4350 Transport St., Unit 107  
Ventura, CA 93003  
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	17 July 08	0900	E	< .05	1 (one gallon)	FHM Acute daily renewal

**Special Instructions:**

**\*\* Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.**

\* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

## CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
<i>Steven R. Aochumbun</i>	<i>Fel B...</i>	17 July 08	1430	yes	—
<i>Fel B...</i>	<i>[Signature]</i>	7-18-08	1000	NA	2°



***REFERENCE  
TOXICANT  
DATA***



***Fathead Minnow  
Reference  
Toxicant  
Data***

**FATHEAD MINNOW ACUTE**  
**Method 2000.0**  
**Reference Toxicant - SDS**



QA/QC Batch No.: RT-080710

**TEST SUMMARY**

Species: *Pimephales promelas*.  
 Age: 14 days old.  
 Regulations: NPDES.  
 Test chamber volume: 250 ml.  
 Feeding: Prior to renewal at 48 hrs.  
 Temperature: 20 +/- 1°C.  
 Number of replicates: 2.  
 Dilution water: MHSF.

Source: In-lab culture.  
 Test type: Static-Renewal.  
 Test Protocol: EPA-821-R-02-012.  
 Endpoints: LC50 at 96 hrs.  
 Test chamber: 600 ml glass beakers.  
 Aeration: None.  
 Number of organisms per chamber: 10.  
 Photoperiod: 16/8 hrs light/dark.

**TEST DATA**

Date/Time: Analyst:	INITIAL			24 Hr					48 Hr				
	<u>7-10-08 1520</u>			<u>7-11-08 1400</u>					<u>7-12-08 1400</u>				
	<u>R</u>			<u>R</u>					<u>R</u>				
	°C	DO	pH	°C	DO	pH	# Dead		°C	DO	pH	# Dead	
A							B	A				B	
Control	<u>20.8</u>	<u>8.8</u>	<u>8.2</u>	<u>20.3</u>	<u>7.3</u>	<u>7.9</u>	<u>0</u>	<u>0</u>	<u>20.4</u>	<u>7.5</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
1.0 mg/l	<u>20.8</u>	<u>8.8</u>	<u>8.2</u>	<u>20.3</u>	<u>7.4</u>	<u>7.9</u>	<u>0</u>	<u>0</u>	<u>20.4</u>	<u>7.6</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
2.0 mg/l	<u>20.9</u>	<u>8.8</u>	<u>8.2</u>	<u>20.3</u>	<u>7.3</u>	<u>7.8</u>	<u>0</u>	<u>0</u>	<u>20.4</u>	<u>7.5</u>	<u>7.8</u>	<u>0</u>	<u>0</u>
4.0 mg/l	<u>20.9</u>	<u>8.9</u>	<u>8.2</u>	<u>20.3</u>	<u>7.0</u>	<u>7.8</u>	<u>0</u>	<u>0</u>	<u>20.3</u>	<u>7.3</u>	<u>7.8</u>	<u>2</u>	<u>1</u>
8.0 mg/l	<u>20.9</u>	<u>8.9</u>	<u>8.2</u>	<u>20.3</u>	<u>7.1</u>	<u>7.8</u>	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Date/Time: Analyst:	RENEWAL			72 Hr					96 Hr				
	<u>7-12-08 1400</u>			<u>7-13-08 1400</u>					<u>7-14-08 1445</u>				
	<u>R</u>			<u>R</u>					<u>R</u>				
	°C	DO	pH	°C	DO	pH	# Dead		°C	DO	pH	# Dead	
A							B	A				B	
Control	<u>20.7</u>	<u>8.5</u>	<u>8.1</u>	<u>20.4</u>	<u>7.2</u>	<u>8.1</u>	<u>0</u>	<u>0</u>	<u>19.9</u>	<u>7.3</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
1.0 mg/l	<u>20.7</u>	<u>8.5</u>	<u>8.1</u>	<u>20.8</u>	<u>7.4</u>	<u>8.0</u>	<u>0</u>	<u>0</u>	<u>19.7</u>	<u>7.4</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
2.0 mg/l	<u>20.7</u>	<u>8.6</u>	<u>8.1</u>	<u>20.6</u>	<u>7.4</u>	<u>8.0</u>	<u>0</u>	<u>0</u>	<u>19.7</u>	<u>7.3</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
4.0 mg/l	<u>20.7</u>	<u>8.6</u>	<u>8.1</u>	<u>20.4</u>	<u>7.4</u>	<u>8.0</u>	<u>0</u>	<u>0</u>	<u>19.6</u>	<u>7.4</u>	<u>7.9</u>	<u>0</u>	<u>0</u>
8.0 mg/l	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Comments: Control: Alkalinity: 69 mg/l; Hardness: 92 mg/l; Conductivity: 330 umho.  
 SDS: Alkalinity: 68 mg/l; Hardness: 92 mg/l; Conductivity: 335 umho.

Concentration-response relationship acceptable? (see attached computer analysis):

Yes (response curve normal)

No (dose interrupted indicated or non-normal)

**Acute Fish Test-96 Hr Survival**

Start Date: 7/10/2008 15:00 Test ID: RT-080710 Sample ID: REF-Ref Toxicant  
 End Date: 7/14/2008 14:45 Lab ID: CAATL-Aquatic Testing Labs Sample Type: SDS-Sodium dodecyl sulfate  
 Sample Date: 7/10/2008 Protocol: ACUTE-EPA-821-R-02-012 Test Species: PP-Pimephales promelas

Comments:

Conc-mg/L	1	2
D-Control	1.0000	1.0000
1	1.0000	1.0000
2	1.0000	1.0000
4	0.8000	0.9000
8	0.0000	0.0000

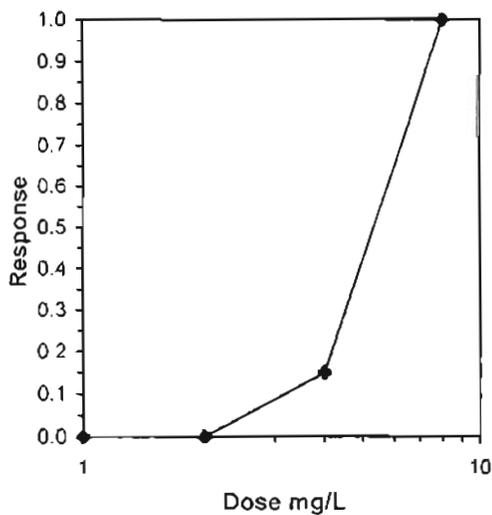
Conc-mg/L	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
1	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
2	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
4	0.8500	0.8500	1.1781	1.1071	1.2490	8.517	2	3	20
8	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

**Auxiliary Tests**

Normality of the data set cannot be confirmed

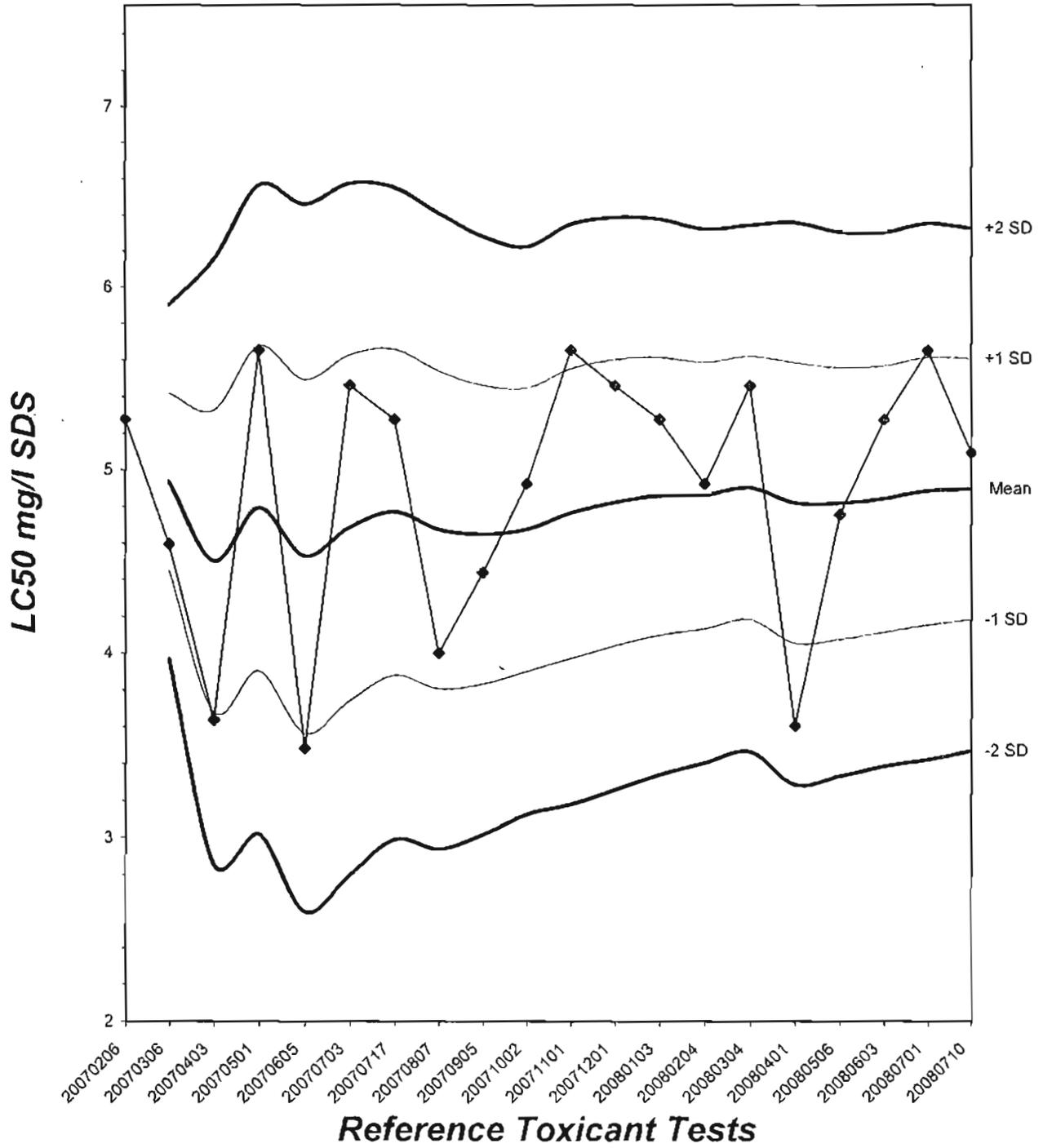
Equality of variance cannot be confirmed

Trim Level	EC50	95% CL		Statistic	Critical	Skew	Kurt
		Lower	Upper				
0.0%	5.0982	4.5640	5.6950				
5.0%	5.2099	4.5766	5.9309				
10.0%	5.2897	4.4710	6.2583				
20.0%	5.3212	4.9289	5.7449				
Auto-0.0%	5.0982	4.5640	5.6950				



# Fathead Minnow Acute Laboratory Control Chart

CV% = 14.6



# TEST ORGANISM LOG



FATHEAD MINNOW - LARVAL  
(*Pimephales promelas*)

QA/QC BATCH NO.: RT-080710

SOURCE: In-Lab Culture

DATE HATCHED: 6-26-08

APPROXIMATE QUANTITY: 400

GENERAL APPEARANCE: good

# MORTALITIES 48 HOURS PRIOR TO  
TO USE IN TESTING: 0

DATE USED IN LAB: 7-10-08

AVERAGE FISH WEIGHT: 0.0054 gm

LOADING LIMITS: 0.65 gm/liter @ 20°C, 0.40 gm/liter @ 25°C

Approximately 1000 fish per 10 liters limit if held overnight for acclimation without filtration @ 20°C for fish with a mean weight of 0.006 gm.

Approximately 650 fish per 10 liters limit if held overnight for acclimation without filtration @ 25°C for fish with a mean weight of 0.006 gm.

200 ml test solution volume = 0.013 gm mean fish weight limit @ 20°C; 0.008 @ 25°C

250 ml test solution volume = 0.016 gm mean fish weight limit @ 20°C; 0.010 @ 25°C

## ACCLIMATION WATER QUALITY:

Temp.: 20.8°C

pH: 8.2

Ammonia: 0.2 mg/l NH<sub>3</sub>-N

DO: 8.5 mg/l

Alkalinity: 69 mg/l

Hardness: 92 mg/l

READINGS RECORDED BY: \_\_\_\_\_



DATE: \_\_\_\_\_

7-11-08

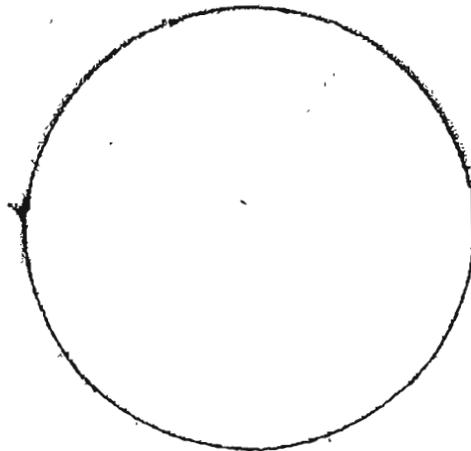
# *Laboratory Temperature Chart*

*QA/QC Batch No: RT-080710*

*Date Tested: 07/10/08 to 07/14/08*

*Acceptable Range: 20 $\pm$ 1 $^{\circ}$ C*

7-7-08  
AL



# *Giant Kelp Germination and Germ Tube Growth Short-Term Toxicity Test*

- *Test and Result Summary*
- *Data Summary and Statistical Analysis*
- *Raw Test Data: Water Quality &  
Test Organism Measurements*

# GIANT KELP GERMINATION AND GROWTH TEST REFERENCE TOXICANT - COPPER



QA/QC Batch No.: RT-080715

Date Tested: 07/15/08 - 07/17/08

## TEST SUMMARY

Species: *Macrocystis pyrifera*.  
 Protocol: EPA Method 1009.0.  
 Test type: Static.  
 Test chamber: Plastic beakers.  
 Temperature: 15 +/- 1°C.  
 Number of spores per ml: 7,500 (approx.).  
 Standard toxicant: Copper chloride.  
 Lab seawater: 0.2 um filtered seawater.

Source: Field collected.  
 Dilution water: Lab seawater.  
 Endpoints: NOEC, IC25 at 48 hrs.  
 Test volume: 200 ml.  
 Aeration: None.  
 Number of replicates: 5.  
 Ref. tox. source: Mallinckrodt.  
 Preservative: none.

## RESULTS SUMMARY

Sample Concentration	Percent Germination		Mean Germ Tube Length (µm)	
Control	84.2%		16.30	
10 µg/l	85.4%		16.60	
18 µg/l	85.2%		15.95	
32 µg/l	72.5%	*	14.00	*
56 µg/l	50.3%	*	11.95	*
100 µg/l	38.6%	*	8.40	*
180 µg/l	11.5%	*	6.20	*

\* Statistically significantly less than control at P = 0.05 level

## CHRONIC TOXICITY

Germination NOEC	18 µg/l
Germination IC25	41.5 µg/l
Germ Tube Growth NOEC	18 µg/l
Germ Tube Growth IC25	51.5 µg/l

## QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination ≥ 70%	Yes (84.2%)
Mean control germination tube length > 10 µm	Yes (16.30 µm)
Germination tube growth NOEC < 35 µg/l Copper	Yes (18 µg/l)
%MSD < 20% relative to control (germination & growth)	Yes (germ = 11.6%, growth = 5.3%)

**Macrocystis Germination and Growth Test-Proportion Germinated**

Start Date: 7/15/2008 14:00    Test ID: RT-080715    Sample ID: REF-Ref Toxicant  
 End Date: 7/17/2008 14:00    Lab ID: CAATL-Aquatic Testing Labs    Sample Type: CUCL-Copper chloride  
 Sample Date: 7/15/2008    Protocol: WCCH-EPA-600-R-95-136    Test Species: MP-Macrocystis pyrifera

Comments:

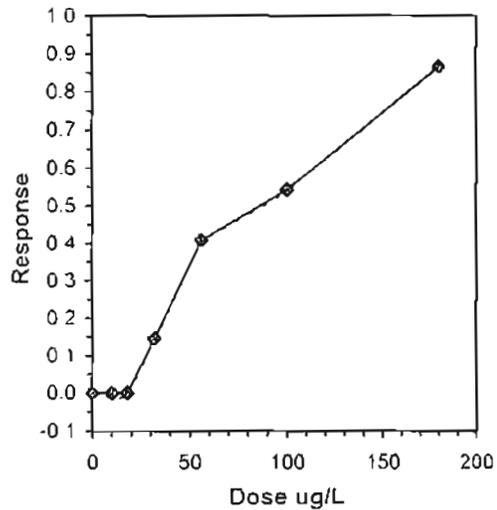
Conc-ug/L	1	2	3	4	5
D-Control	0.8462	0.8738	0.8317	0.8571	0.8039
10	0.8000	0.8585	0.8529	0.9029	0.8529
18	0.8447	0.8846	0.8350	0.8738	0.8235
32	0.6727	0.7248	0.7928	0.7477	0.6857
56	0.5676	0.3805	0.6372	0.6275	0.3019
100	0.4746	0.4771	0.3137	0.2883	0.3739
180	0.1509	0.1111	0.0636	0.1509	0.0962

Conc-ug/L	Mean	N-Mean	Transform: Arcsin Square Root					N	t-Stat	1-Tailed Critical	MSD	Isotonic	
			Mean	Min	Max	CV%	Mean					N-Mean	
D-Control	0.8425	1.0000	1.1637	1.1121	1.2076	3.108	5				0.8495	1.0000	
10	0.8535	1.0130	1.1801	1.1071	1.2539	4.406	5	-0.325	2.409	0.1215	0.8495	1.0000	
18	0.8523	1.0116	1.1774	1.1373	1.2242	3.142	5	-0.272	2.409	0.1215	0.8495	1.0000	
*32	0.7247	0.8602	1.0197	0.9618	1.0982	5.388	5	2.855	2.409	0.1215	0.7251	0.8536	
*56	0.5029	0.5969	0.7877	0.5817	0.9243	19.723	5	7.457	2.409	0.1215	0.5028	0.5918	
*100	0.3855	0.4576	0.6683	0.5668	0.7625	13.616	5	9.823	2.409	0.1215	0.3874	0.4560	
*180	0.1146	0.1360	0.3416	0.2550	0.3990	17.796	5	16.301	2.409	0.1215	0.1142	0.1345	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.98101	0.934	-0.4638	0.74283
Bartlett's Test indicates equal variances (p = 0.04)	13.3718	16.8119		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Dunnett's Test	18	32	24	
Treatments vs D-Control	MSDu	MSDp	MSB	MSE
	0.09754	0.11567	0.51432	0.00636
	F-Prob	df		
	2.2E-16	6, 28		

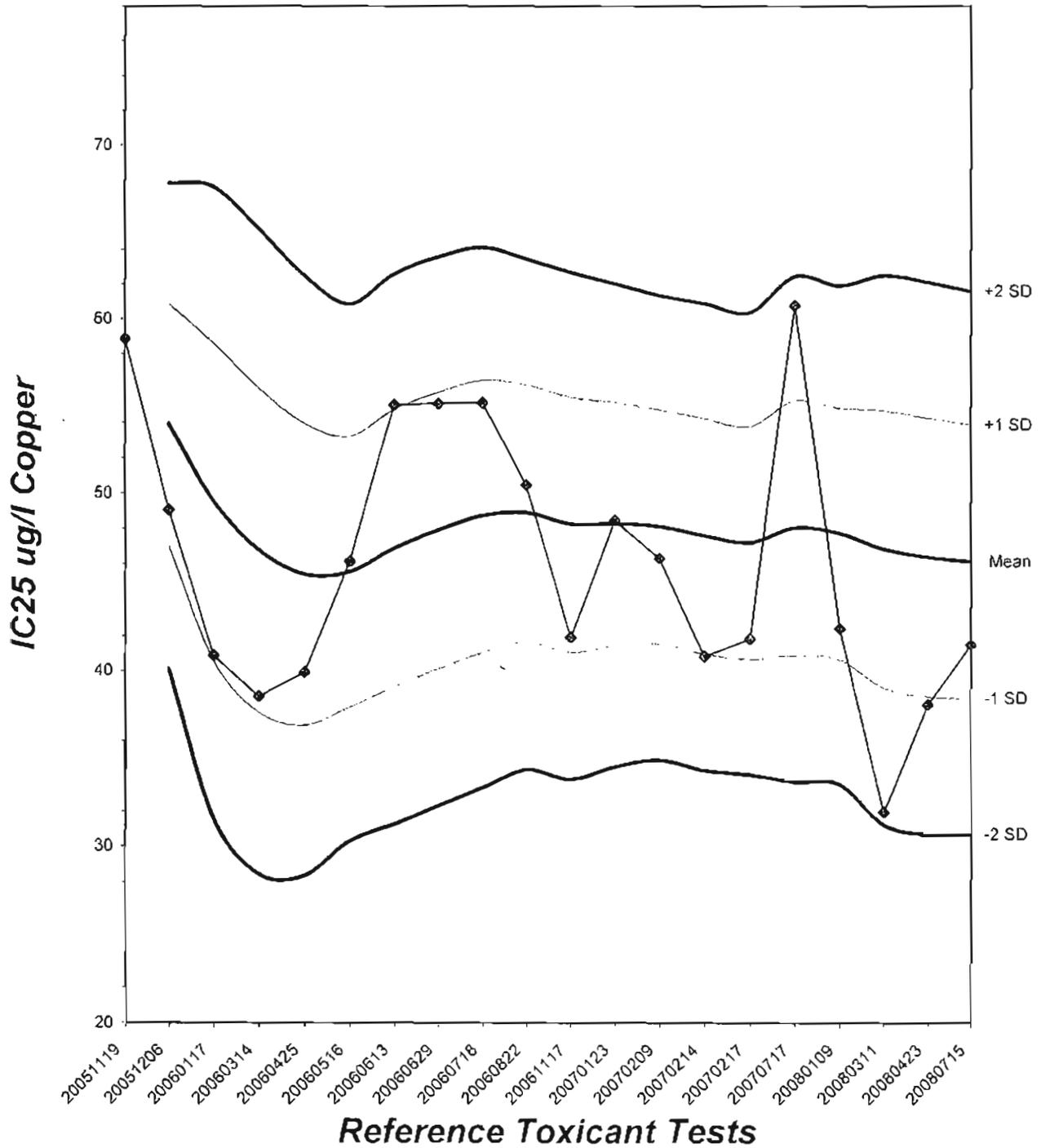
Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL(Exp)		Skew
IC05	22.781	1.088	19.474	25.500	0.7327
IC10	27.561	1.810	23.345	33.795	0.7736
IC15	32.328	2.135	26.977	38.715	0.5738
IC20	36.913	2.486	30.518	46.451	1.0730
IC25	41.497	3.386	34.593	55.372	1.3831
IC40	55.252	8.807	42.697	94.038	1.1937
IC50	85.755	15.626	36.663	119.210	-0.2079



# Giant Kelp Germination Laboratory Control Chart

CV% = 16.8



**Macrocystis Germination and Growth Test-Growth-Length**

Start Date: 7/15/2008 14:00 Test ID: RT-080715 Sample ID: REF-Ref Toxicant  
 End Date: 7/17/2008 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: CUCL-Copper chloride  
 Sample Date: 7/15/2008 Protocol: WCCH-EPA-600-R-95-136 Test Species: MP-Macrocystis pyrifera  
 Comments:

Conc-ug/L	1	2	3	4	5
D-Control	14.750	16.750	17.000	16.500	16.500
10	16.750	16.500	16.750	16.500	16.500
18	16.250	16.250	16.250	15.250	15.750
32	14.000	14.000	13.500	14.250	14.250
56	12.250	12.750	12.500	11.750	10.500
100	7.750	9.000	8.750	8.250	8.250
180	6.250	6.000	6.000	6.750	6.000

Conc-ug/L	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%	Critical			MSD	
D-Control	16.300	1.0000	16.300	14.750	17.000	5.466	5				
10	16.600	1.0184	16.600	16.500	16.750	0.825	5	-0.838	2.409	0.862	
18	15.950	0.9785	15.950	15.250	16.250	2.804	5	0.977	2.409	0.862	
*32	14.000	0.8589	14.000	13.500	14.250	2.187	5	6.423	2.409	0.862	
*56	11.950	0.7331	11.950	10.500	12.750	7.455	5	12.148	2.409	0.862	
*100	8.400	0.5153	8.400	7.750	9.000	5.802	5	22.063	2.409	0.862	
*180	6.200	0.3804	6.200	6.000	6.750	5.257	5	28.207	2.409	0.862	

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.89001	0.934	-1.349	2.63146						
Bartlett's Test indicates equal variances (p = 0.02)	15.0846	16.8119								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	18	32	24		0.86244	0.05291	84.7411	0.32054	2.6E-23	6, 28
Treatments vs D-Control										

**Macrocystis Germination and Growth Test-Growth-Length**

Start Date: 7/15/2008 14:00 Test ID: RT-080715 Sample ID: REF-Ref Toxicant  
 End Date: 7/17/2008 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: CUCL-Copper chloride  
 Sample Date: 7/15/2008 Protocol: WCCH-EPA-600-R-95-136 Test Species: MP-Macrocystis pyrifera

Comments:

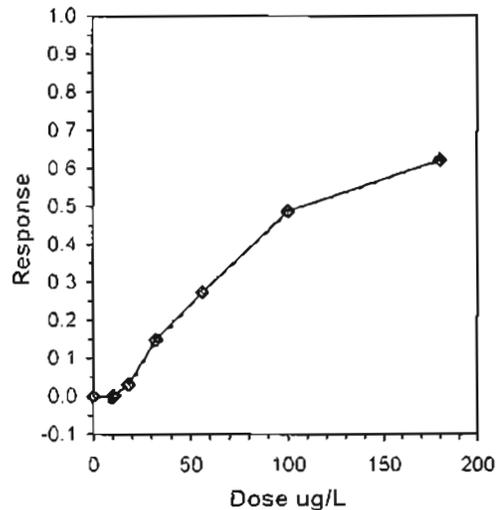
Conc-ug/L	1	2	3	4	5
D-Control	14.750	16.750	17.000	16.500	16.500
10	16.750	16.500	16.750	16.500	16.500
18	16.250	16.250	16.250	15.250	15.750
32	14.000	14.000	13.500	14.250	14.250
56	12.250	12.750	12.500	11.750	10.500
100	7.750	9.000	8.750	8.250	8.250
180	6.250	6.000	6.000	6.750	6.000

Conc-ug/L	Transform: Untransformed							Rank Sum	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N			Mean	N-Mean
D-Control	16.300	1.0000	16.300	14.750	17.000	5.466	5			16.450	1.0000
10	16.600	1.0184	16.600	16.500	16.750	0.825	5	28.00	16.00	16.450	1.0000
18	15.950	0.9785	15.950	15.250	16.250	2.804	5	20.00	16.00	15.950	0.9696
*32	14.000	0.8589	14.000	13.500	14.250	2.187	5	15.00	16.00	14.000	0.8511
*56	11.950	0.7331	11.950	10.500	12.750	7.455	5	15.00	16.00	11.950	0.7264
*100	8.400	0.5153	8.400	7.750	9.000	5.802	5	15.00	16.00	8.400	0.5106
*180	6.200	0.3804	6.200	6.000	6.750	5.257	5	15.00	16.00	6.200	0.3769

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.89001	0.934	-1.349	2.63146
Bartlett's Test indicates equal variances (p = 0.02)	15.0846	16.8119		

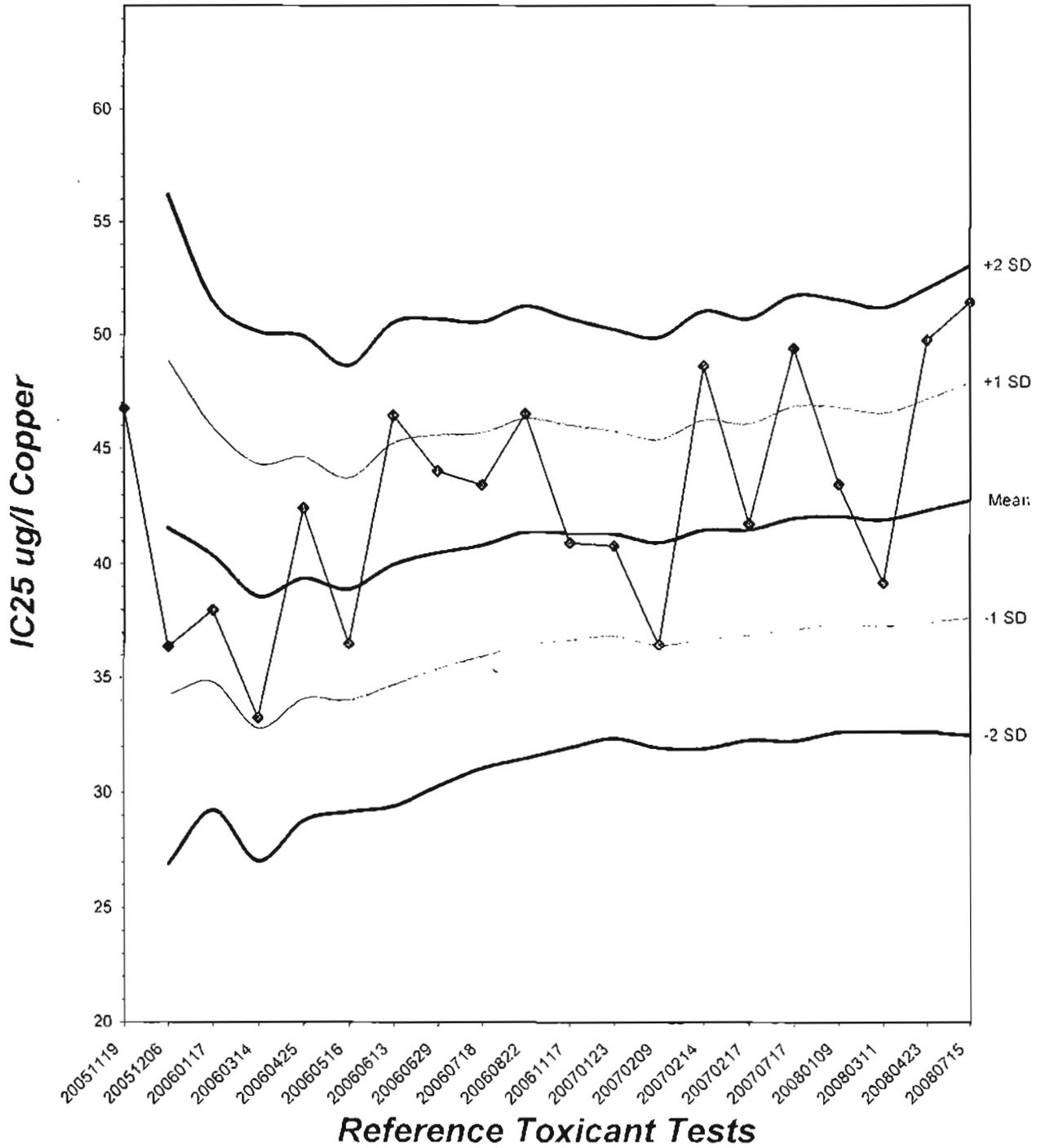
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	
Treatments vs D-Control				

Point	Linear Interpolation (200 Resamples)				
	ug/L	SD	95% CL(Exp)	Skew	
IC05	20.32	1.89	13.94	24.77	-0.2984
IC10	26.22	1.58	21.36	31.20	0.1810
IC15	32.20	1.92	27.78	39.22	0.7591
IC20	41.83	2.48	35.81	49.34	0.3583
IC25	51.46	3.40	43.02	61.65	0.2834
IC40	81.78	2.48	73.65	87.64	-0.3924
IC50	106.36	5.86	92.41	121.79	0.2127



# Giant Kelp Germ Tube Growth Laboratory Control Chart

CV% = 12



# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



QA/QC No.: RT-080715

Start Date: 07/15/2008

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
1	10	109	84	21	6	7	7	6	5	7	8	8	7	4
2	32	110	74	36	7	5	7	6	6	4	5	5	6	5
3	C	104	88	16	5	7	6	5	7	7	6	5	7	4
4	180	106	16	90	3	2	2	2	3	4	2	2	3	2
5	18	103	87	16	7	6	7	5	7	6	7	7	7	6
6	100	118	56	62	3	4	2	3	3	4	2	3	3	4
7	56	111	63	48	6	5	6	4	4	5	4	5	4	6
8	C	103	90	13	6	7	5	7	7	8	7	6	7	7
9	18	104	92	12	7	6	7	5	5	6	7	7	7	8
10	56	113	43	70	5	7	6	4	4	6	5	5	4	5
11	180	108	12	96	3	2	2	2	4	2	2	2	3	2
12	10	106	91	15	7	6	5	7	8	7	7	4	8	7
13	32	109	79	30	6	7	5	6	5	6	6	5	4	6
14	100	109	52	57	3	4	2	5	4	3	4	4	3	4
15	10	102	87	15	7	5	6	6	8	7	7	8	6	7
16	32	111	88	23	5	7	6	4	7	5	5	5	6	4
17	100	102	32	70	3	4	5	3	4	5	2	2	4	3
18	18	103	86	17	6	7	7	6	8	7	6	6	5	7
19	C	101	84	17	8	7	8	7	7	6	5	7	7	6
20	180	110	7	103	3	2	2	2	2	2	4	2	2	3

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



QA/QC No.: RT-080715

Start Date: 07/15/2008

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
21	56	113	72	41	6	4	6	5	3	6	6	4	4	6
22	10	103	93	10	6	8	8	4	6	7	5	7	7	8
23	100	111	32	79	3	4	3	4	2	2	5	2	4	4
24	32	107	80	27	5	7	6	6	5	4	7	6	6	5
25	C	105	90	15	7	8	6	6	7	7	6	5	7	7
26	180	106	16	90	3	2	4	4	3	2	2	2	3	2
27	18	103	90	13	7	6	7	5	5	7	6	6	5	7
28	56	102	64	38	5	4	4	5	4	6	6	5	4	4
29	18	102	84	18	7	7	6	5	6	7	7	5	6	7
30	56	106	32	74	5	4	6	4	4	5	2	3	4	5
31	10	102	87	15	5	7	7	6	7	6	6	7	8	7
32	100	115	43	72	2	4	3	4	2	2	3	4	5	4
33	32	105	72	33	7	6	4	4	5	7	6	5	6	7
34	180	104	10	94	2	3	2	2	2	4	2	2	3	2
35	C	102	82	20	7	6	8	7	7	6	5	7	7	6
36														
37														
38														
39														
40														

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



QA/QC No.: RT-080715

Start Date: 07/15/2008

## WATER QUALITY READINGS

Sample	Initial Readings				Final Readings			
	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.8	7.4	8.1	34	15.7	7.4	8.0	34
10 µg/l	15.4	7.4	8.1	34	15.0	7.5	8.0	34
18 µg/l	15.6	7.4	8.1	34	15.6	7.3	8.0	34
32 µg/l	15.7	7.6	8.1	34	15.3	7.2	8.0	34
56 µg/l	15.4	7.6	8.1	34	15.3	7.4	8.0	34
100 µg/l	15.6	7.4	8.1	34	15.2	7.2	8.0	34
180 µg/l	15.7	7.6	8.1	34	15.3	7.2	8.0	34

**Comments:**

Reference toxicant: Copper chloride.

All dilutions made with reference lab seawater.

Illumination (16 hr light / 8 hr dark at  $50 \pm 10$   $\mu\text{E}/\text{m}^2/\text{s}$ ) at 5 locations in incubator:  
(four corners and center): 45, 42, 47, 41, 45  $\mu\text{E}/\text{m}^2/\text{s}$ .

Initial readings: Analyst: [Signature] Date: 7-15-08 Time: 1400

Final readings: Analyst: [Signature] Date: 7-17-08 Time: 1400

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



QA/QC No.: RT-080715

Start Date: 07/15/2008

## RANDOMIZATION WORKSHEET

Beaker No.	Sample Conc.	Notes						
1	10	11	180	21	56	31	10	<p>Need 7500/ml x 50 ml = 375,000 spores.</p> <p>Add 0.25 ml spore stock of 6 spores per 5x5 hemacytometer grid</p> <p style="text-align: center;">or</p> <p>Need 7500/ml x 200 ml = 1,500,000 spores.</p> <p>Add 1.0 ml spore stock of 6 spores per 5x5 hemacytometer grid</p>
2	32	12	10	22	10	32	100	
3	C	13	32	23	100	33	32	
4	180	14	100	24	32	34	180	
5	18	15	10	25	C	35	C	
6	100	16	32	26	180	36		
7	56	17	100	27	18	37		
8	C	18	18	28	56	38		
9	18	19	C	29	18	39		
10	56	20	180	30	56	40		

Analyst:  Date: 7-15-08 Time: 1100

# *Laboratory Temperature Chart*

*QA/QC Batch No: RT-080715*

*Date Tested: 07/15/08 to 07/17/08*

*Acceptable Range: 15 $\pm$  1 $^{\circ}$ C*

