SUPPLEMENTAL SAMPLING AND ANALYSIS REPORT

ALAMITOS BAY MARINA BASIN 1

Prepared for
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# LIST OF ACRONYMS AND ABRREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>Calscience</td>
<td>Calscience Marine Analytical Laboratory</td>
</tr>
<tr>
<td>ERL</td>
<td>effects range low</td>
</tr>
<tr>
<td>ND</td>
<td>non-detect</td>
</tr>
<tr>
<td>QA</td>
<td>quality assurance</td>
</tr>
<tr>
<td>QC</td>
<td>quality control</td>
</tr>
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<td>SSAP</td>
<td>Supplemental Sampling and Analysis Plan</td>
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<td>USEPA</td>
<td>U.S. Environmental Protection Agency</td>
</tr>
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<td>Weston</td>
<td>Weston Solutions, Inc.</td>
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1 INTRODUCTION

This document presents the results of the supplemental dredged material sampling and analysis field program for Basin 1 of the Alamitos Bay Marina, located in the City of Long Beach, California (Figure 1). Sampling and analysis was conducted pursuant to the approved Supplemental Sampling and Analysis Plan (SSAP) dated January 2009 (Anchor). The SSAP was prepared in response to agencies concerns regarding mercury distribution in Basin 1. Previous sampling and analysis results conducted by Weston Solutions, Inc. (Weston; 2007a and 2007b), in 2007 indicated acceptable Tier III test results, but some elevated concentrations of mercury were found in Basin 1. Subsequently, the agencies and the applicant agreed to pursue this supplemental sampling to further refine the horizontal and vertical extent of mercury within Basin 1. This document presents the results of that effort.

The general scope of work for this sampling effort included collecting physical and chemical data from twelve sediment core samples at discrete, 1-foot intervals to characterize the distribution of mercury in the proposed dredge cuts. The sampling locations are shown in Figure 2.
Figure 1
Vicinity Map
Alamitos Bay Marina Basin 1
2 REPORT ORGANIZATION

This report presents the results of the sampling and analysis program as described in the project SAP. This report is organized as follows:

- Section 1 – Introduction
- Section 2 – Report Organization
- Section 3 – Sediment Core Collection and Sample Processing
- Section 4 – Chemical and Physical Analyses
- Section 5 – Quality Assurance and Quality Control Summary
- Section 6 – Conclusions and Recommended Suitability Determinations
- Section 7 – References

Appendices provide supporting project documentation and are organized as follows:

- Appendix A – Field Recording Forms
- Appendix B – Laboratory Data Package
3 SEDIMENT CORE COLLECTION AND SAMPLE PROCESSING

This section summarizes the sediment sampling and processing activities conducted in connection with the characterization of marina sediments. Sampling and sample processing were carried out in accordance with the SSAP.

3.1 Summary of Sample Collection Activities

A total of 12 sediment core samples were extracted and subsampled at discrete intervals on February 19 and 20, 2009. Samples were collected by a barge-mounted vibro-core (pictured below). Core logs presented in Appendix A depict the locations of the discrete intervals relative to each core. Table 1 (below) presents the data by core and interval and includes a note reconciling this issue.

Photograph 1. Barge-mounted vibro-core.
Table 1
Sediment Core Recovery and Compositing Scheme

<table>
<thead>
<tr>
<th>Station Sample ID</th>
<th>Water Depth (MLLW)</th>
<th>Penetration Depth (MLLW)</th>
<th>Core Recovery (feet)</th>
<th>Discrete Samples Collected</th>
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<tr>
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<td>4.0</td>
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<td>01, 02, 03, 04, 05, 06</td>
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3.2 Summary of Sample Processing Activities

Sediment cores were processed on shore, per the SSAP and regional guidance. Sample containers were filled, labeled, packed, and shipped to CalScience Marine Analytical Laboratory (CalScience) in Huntington Beach, California, for mercury analyses. Appropriate chain-of-custody procedures were followed.

3.3 Deviations from the Supplemental Sampling and Analysis Plan

Cored depths are all considered to adequately represent the dredge prism for sediment characterization. During sample processing, there were no deviations from the procedures detailed in the SAP.
4 CHEMICAL AND PHYSICAL ANALYSES

All discrete sediment samples were analyzed for mercury and grain size as described in the SSAP. Mercury was analyzed using U.S. Environmental Protection Agency (USEPA) method 7471A. Data for mercury and grain size by core and interval is presented in Table 2 below.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>Interval</th>
<th>Top of Interval (feet MLLW)</th>
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<th>Mercury</th>
<th>Percent Fines</th>
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<td>-17</td>
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Table 2
Mercury and Grain Size by Core and Interval

<table>
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<th>Station ID</th>
<th>Interval</th>
<th>Top of Interval (feet MLLW)</th>
<th>Bottom of Interval (feet MLLW)</th>
<th>Mercury</th>
<th>Percent Fines</th>
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<td>ND</td>
<td>83</td>
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<td>-17.4</td>
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<td>81</td>
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</tbody>
</table>

Notes:
ND – non-detect

4.1 Visual Analysis of Cores in the Field
Visual inspection of cores in the field indicated that material is predominantly comprised of gray to dark gray silts overlaying, fine to silty sands containing some cobble and shell fragments. No obvious contaminant layers or sheens were observed. For detailed visual descriptions of each core please see Appendix A. Cores were also photo-logged in the field.

4.2 Results of Chemical and Physical Analyses
The results of the discrete interval analyses for mercury are depicted in Table 2 and on Figures 3 though 6. Mercury concentrations appeared highly dependent on grain size and location within the basin. The figures show a conservative weighted average interpretation of mercury concentrations throughout the basin, which are computed based on the point data contained in Table 2. Figure 3 shows the modeled mosaic of mercury concentrations from -10 to -13 feet MLLW. Figure 4 similarly shows the mercury concentrations below -13 feet MLLW.
feet MLLW. An evaluation of the overall area interpreted indicates that the “southeast” and “northwest” corners have low (effects range low [ERL] or below) mercury concentrations. These areas are shown in Figures 5 and 6, which were generated by isolating these “corner” areas and running the model on the concentrations within these boundaries.

An interpolation of mercury concentration related to grain size is shown in Figure 7. In general, unacceptable (e.g. higher than ERL) mercury concentrations occur predominantly in finer grained (e.g., silty) material above 60 percent fines.

The result of this program is that 33,738 cubic yards (cy) of material is requested for approval for disposal at LA-2 (including 2 feet of overdepth), and 25,504 cy (including 2 feet of overdepth) would be required to be disposed of in an approved confined location (e.g., an approved landfill, confined aquatic disposal [CAD], or upland confined disposal facility [CDF]).

These results were discussed with the agencies in a conference call format. The result of the call was agreement that the areas shown in Figures 5 and 6 were acceptable for ocean disposal, in combination with the previously completed Tier III analyses. Based on this call, the applicant’s engineer created a dredge plan matching these results (Figure 8).
Figure 3
Mercury Concentrations -10 to -13 feet MLLW
Alamitos Bay Marina Basin 1

Note:
1. High and Low values from all interval depths.
2. Non-detected, value calculated as 0.05 in IDW.

Sample Location
Mercury Concentration (ppm)
High : 2.99369
Low : 0.042564
Mercury Concentration (ppm)

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>High</th>
<th>Low</th>
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</thead>
<tbody>
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<td>ABM-CS-2</td>
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<td>ABM-CS-3</td>
<td>0.0363</td>
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<td>ABM-CS-4</td>
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</tr>
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<td>ABM-CS-5</td>
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<td>ABM-CS-6</td>
<td>2.38</td>
<td>0.1315</td>
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</table>

Note:
1. High and Low values from all interval depths.
2. Non-detected value calculated as 0.05 in IDW.
Figure 5
Mercury Concentrations -10 to -16 feet MLLW
Alamitos Bay Marina Basin 1

SAMPLE LOCATION
Mercury Concentration (ppm)
High: 2.99369
Low: 0.042564

Note:
1. High and low values from all interval depths and all sample locations.
2. Non-detect value calculated as 0.05 in IDW.
<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Mercury Concentration (ppm)</th>
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<tbody>
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<td></td>
<td>High : 2.99389</td>
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<tr>
<td></td>
<td>Low : 0.042564</td>
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</table>

Note:
1. High and low values from all interval depths and all sample locations.
2. Non-detect value calculated as 0.05 in IDW.
Figure 7
Mercury Concentration by Grain Size
Alamitos Bay Marina Basin 1
Figure 8
Dredge Plan
Alamitos Bay Marina Basin 1

NOTE: AREAS SHOWN TO BE DREDGED HAVE BEEN DETERMINED TO HAVE LOW CONCENTRATIONS OF MERCURY AND ARE ANTICIPATED TO BE ACCEPTABLE TO DISPOSE OF OFFSHORE.
5 Quality Assurance and Quality Control Summary

Quality assurance/quality control (QA/QC) review entailed reviewing for sample integrity, achievement of target reporting limits, correct methodology, instrument calibration, and all appropriate QC requirements. Several duplicate samples were run to ensure consistency of results. Results for these samples were reviewed, and the data quality assessment found that all data were usable as qualified. Method blanks and laboratory control samples performed indicate that all laboratory methods were correct, and the data were released without qualification. For more information, please see the laboratory data package in Appendix B.
6 CONCLUSIONS AND RECOMMENDED SUITABILITY DETERMINATIONS

Based on the results presented in this report, and in combination with the previous Tier I through III results presented in the Weston reports (2007a and 2007b), the City of Long Beach hereby requests approval for ocean disposal at LA-2 for:

- Basin 1, dredge material from the prisms indicated in Figure 8
- Basins 2 through 7, all dredged material as described in the Weston reports (2007a and 2007b)

Again, the corresponding Tier III evaluations were presented in the Weston reports (2007a and 2007b). In Basin 1, the applicant has demonstrated that mercury concentrations in the requested areas are very low (below ERL to non-detect), and the grain size is unsuitable for beneficial reuse. All other material in Basin 1 (material from outside the prisms shown on Figure 8) would be taken to an approved off-site location.

The combined Alamitos Bay Marina Basin project (Basins 1 through 7) would include approximately 262,000 cy of ocean disposal phased over several years of construction. Note that moving forward, the City and the agencies will need to discuss phased reconfirmation of bulk chemical results, which would depend on the overall duration of the project.
7 REFERENCES


APPENDIX A
FIELD RECORDING FORMS
Sediment Core Collection Form

<table>
<thead>
<tr>
<th>Station ID:</th>
<th>ABM-CS-1</th>
<th>Date:</th>
<th>2-19-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Alamitos Bay Marina Basin 1</td>
<td>Project Number:</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Coordinates:</td>
<td>33° 44.9843' Lat/Northing</td>
<td>Long/Easting:</td>
<td>118° 06.7584'</td>
</tr>
<tr>
<td>Vertical Datum</td>
<td>MLW</td>
<td>Other:</td>
<td></td>
</tr>
<tr>
<td>Depth Measurement</td>
<td>Sounder</td>
<td>Leadline</td>
<td></td>
</tr>
<tr>
<td>Project Depth</td>
<td>12'</td>
<td>Overdredge</td>
<td>2'</td>
</tr>
</tbody>
</table>

| Time Start:         | 11:00                  |             |             |
| Attempt 1           |                        |             |             |
| (A) Measured Water Depth | 11.0'                |             |             |
| (B) Tide Height     | 0.8'                   |             |             |
| (C) Mudline Elevation | -10.2'               |             |             |

(-A+B = C include sign of tide height as reported)

Estimated Penetration Length: 5'

Description of Core Drive: Hard, steady push

Refusal Encountered?: No

Total Core Recover Length: 3.1'

Time End:             

Core Characteristics

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>cobble, gravel, sand C M F , silt clay, organic matter</th>
<th>cobble, gravel, sand C M F , silt clay, organic matter</th>
<th>cobble, gravel, sand C M F , silt clay, organic matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Color</td>
<td>gray, black, brown brown surface, olivine</td>
<td>gray, black, brown brown surface, olivine</td>
<td>gray, black, brown brown surface, olivine</td>
</tr>
<tr>
<td>Sediment Odor</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
</tr>
</tbody>
</table>

Any Layering Homogeneous: Layering – fine sandy silt on top. Fine grain sand bottom

Comments:

Shells and rocks found throughout core

Recorded by:    BAG, TLS
## Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Job No.** 080482-01 BG03 T4  
**Exploration/Core No.** ABM-CS-1  
**Date** 2.19.09  
**Core Pushed By** TEG  
**Core Logged By** TLS, BJ, JM (ABC)  
**Type of Core**  
- [ ] Shelby
- [ ] Piston Core
- [ ] Other-Vibracore  
**Water Depth** 11.0’  
**Mudline Elevation** -10.2’  
**Penetration Length (feet)** 5  
**Core Recovery (feet)** 3.1  
**Core Quality**  
- [ ] Good
- [ ] Fair
- [ ] Poor
- [ ] Disturbed  
**Average % Compaction =**

### Core Sections

<table>
<thead>
<tr>
<th>Depth in (ft.)</th>
<th>Theoretical</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9”</td>
<td>1</td>
<td>01</td>
<td>01 Dup</td>
<td>fine sandy silt, shells, trash, rock, dark gray color, weak sulfide odor</td>
</tr>
<tr>
<td>19”</td>
<td>2</td>
<td>02</td>
<td>02 Dup</td>
<td>fine sandy silt, shells, layer of organic debris at 12-13”, dark gray color</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>03</td>
<td>03 Dup</td>
<td>fine grain sand, dark gray color, 4” rock at 17-18”</td>
</tr>
<tr>
<td>37.2”</td>
<td>3</td>
<td></td>
<td></td>
<td>end of core (~15’ MLLW)</td>
</tr>
</tbody>
</table>

### Classification and Remarks

- (Color, Consistency, Moisture, Grain Size, Sheen, Odor)
## Sediment Core Collection Form

**Station ID:** ABM-CS-2  
**Date:** 2-19-09

**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4

**Coordinates:**
- Lat/Northing: 33° 44.9833’
- Long/Easting: 118° 06.7920’

**Vertical Datum:** MLLW

**Depth Measurement:**
- Sounder
- Leadline

**Project Depth:** 12’  
**Overdredge:** 2’

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Start:</strong></td>
<td>12:00</td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>11.6’</td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>0.2’</td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-11.4’</td>
<td></td>
</tr>
</tbody>
</table>

\[ (-A+B = C \text{ include sign of tide height as reported}) \]

**Estimated Penetration Length:** 4’

**Description of Core Drive:** Soft, easy push  
Softer surface layer

**Refusal Encountered?** No

**Total Core Recover Length:** 4.1’

**Time End:**

### Core Characteristics

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering Homogeneous</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobble, gravel, sand C M F, silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Clay randomly found throughout core</td>
<td>BAG, TLS</td>
</tr>
</tbody>
</table>
## Visual Classification of Subsurface Core

**Job No.** 080482-01 BG03 T4  
**Exploration/Core No.** ABM-CS-2  
**Water Depth** 11.6'  
**Mudline Elevation** -11.4'  
**Penetration Length (feet)** 4  
**Core Recovery (feet)** 4.1

<table>
<thead>
<tr>
<th>Theoretical Depth in (ft.)</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
<th>Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>01</td>
<td></td>
<td>fine sandy silt, no odor, dark gray color</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>02</td>
<td></td>
<td>fine sandy silt with clay lenses, shell at 17&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>2</td>
<td>03</td>
<td></td>
<td>gray clay</td>
</tr>
<tr>
<td>22&quot;</td>
<td>2</td>
<td>04</td>
<td></td>
<td>fine grain sand, gray color</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>brown coloring spread throughout</td>
</tr>
<tr>
<td>28&quot;</td>
<td>4</td>
<td></td>
<td></td>
<td>end of core (~15.5' MLLW)</td>
</tr>
<tr>
<td>49&quot;</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Sediment Core Collection Form**

<table>
<thead>
<tr>
<th>Station ID:</th>
<th>ABM-CS-3</th>
<th>Date:</th>
<th>2-19-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Alamitos Bay Marina Basin 1</td>
<td>Project Number:</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Coordinates:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lat/Northing</td>
<td>33° 45.0191'</td>
<td>Long/Easting:</td>
<td>118° 06.7210'</td>
</tr>
<tr>
<td>Vertical Datum</td>
<td>MLLW</td>
<td></td>
<td>MLW</td>
</tr>
<tr>
<td>Depth Measurement</td>
<td>Sounder</td>
<td></td>
<td>Leadline</td>
</tr>
</tbody>
</table>

| Project Depth       | 12'                          | Overdredge    | 2'      |

<table>
<thead>
<tr>
<th></th>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Start:</td>
<td>9:30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>14.5'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>2.3'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-12.2'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(-A+B = C include sign of tide height as reported)

| Estimated Penetration Length | 6'                          |
| Description of Core Drive   | Hard push towards bottom    |
| Refusal Encountered?        | No                          |
| Total Core Recover Length   | 6'                          |

| Time End:               |                             |

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>cobble, gravel, sand C M F, silt clay, organic matter</th>
<th>cobble, gravel, sand C M F, silt clay, organic matter</th>
<th>cobble, gravel, sand C M F, silt clay, organic matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Color</td>
<td>gray, black, brown brown surface, olivine</td>
<td>gray, black, brown brown surface, olivine</td>
<td>gray, black, brown brown surface, olivine</td>
</tr>
<tr>
<td>Sediment Odor</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
</tr>
<tr>
<td>Any Layering Homogeneous</td>
<td>Layering – fine sandy silt top, fine grain sand bottom</td>
<td>Layering – fine sandy silt top, fine grain sand bottom</td>
<td>Layering – fine sandy silt top, fine grain sand bottom</td>
</tr>
</tbody>
</table>

**Comments:**

Rocks and shell fragments spread throughout core

**Recorded by:** BAG, TLS
### Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Job No.** 080482-01 BG03 T4  
**Date** 2.19.09  
**Core Pushed By** TEG  
**Core Logged By** TLS, BJ, JM (ABC)  
**Type of Core**  
- [ ] Shelby  
- [ ] Piston Core  
- [x] Other- Vibracore  
**Diameter of Core (inches)** 4  
**Mudline Elevation** -12.2’  
**Penetration Length (feet)** 6  
**Core Recovery (feet)** 6  
**Water Depth** 14.5’  
**Core Quality**  
- [ ] Good  
- [ ] Fair  
- [ ] Poor  
- [ ] Disturbed  
**Average % Compaction** =

### Core Sections

<table>
<thead>
<tr>
<th>Theoretical Depth in (ft.)</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
<th>Classification and Remarks (Color, Consistency, Moisture, Grain Size, Sheen, Odor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16”</td>
<td>01</td>
<td></td>
<td></td>
<td>fine sandy silt, gray color, no odor, trash, shell fragments</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td></td>
<td></td>
<td>fine grain sand, gray color, no odor, rocks at 24&quot;, 28&quot;, and 39&quot;</td>
</tr>
<tr>
<td></td>
<td>03</td>
<td></td>
<td></td>
<td>small shell fragments</td>
</tr>
<tr>
<td></td>
<td>04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>05</td>
<td></td>
<td></td>
<td>fine sandy silt, gray color</td>
</tr>
<tr>
<td></td>
<td>57”</td>
<td></td>
<td></td>
<td>end of core (~18' MLLW)</td>
</tr>
</tbody>
</table>
### Sediment Core Collection Form

**Station ID:** ABM-CS-4  
**Date:** 2-19-09

**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4

**Coordinates:**  
Lat/Northing: 33° 45.0191'  
Long/Easting: 118° 06.7210'

**Vertical Datum:**  
MLLW

**Depth Measurement:**  
Sounder

**Project Depth** 12'  
**Overdredge** 2'

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Start:</strong></td>
<td>1:30</td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>10.5'</td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>0.0'</td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-10.5'</td>
<td></td>
</tr>
</tbody>
</table>

\(-A+B = C \text{ include sign of tide height as reported}\)

| Estimated Penetration Length | 4' |
| Description of Core Drive | Very smooth, easy push |
| Refusal Encountered? | No |
| Total Core Recover Length | 4' |

**Time End:**

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering Homogeneous</th>
<th>Comments</th>
</tr>
</thead>
</table>
| cobble, gravel, sand, silt, clay, organic matter | gray, black, brown surface, olivine | None, slight, mod, strong H₂S, petroleum, septic | Layering – silt, clay, and fine grained sand | Clay spread throughout bottom of core  
Some shells and shell fragments found throughout core |

**Recorded by:** BAG, TLS
### Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Job No.** 080482-01 BG03 T4  
**Date** 2.19.09  
**Core Pushed By** TEG  
**Core Logged By** TLS, BJ, JM (ABC)  
**Type of Core**  
- [ ] Shelby  
- [ ] Piston Core  
- [x] Other - Vibracore  
**Diameter of Core (inches)** 4  
**Water Depth** 10.5’  
**Mudline Elevation** -10.5’  
**Penetration Length (feet)** 4  
**Core Recovery (feet)** 4  

### Core Quality
- [x] Good  
- [ ] Fair  
- [ ] Poor  
- [ ] Disturbed  

### Average % Compaction =

### Classification and Remarks

<table>
<thead>
<tr>
<th>Theoretical Depth in (ft.)</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Sections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td></td>
<td></td>
<td>silt, slight hydrocarbon odor, dark gray color</td>
</tr>
<tr>
<td>19”</td>
<td></td>
<td>02</td>
<td>silt, moderate hydrocarbon odor, dark gray color, shell at 19”</td>
</tr>
<tr>
<td>33”</td>
<td></td>
<td>03</td>
<td>clay, gray color with brown lenses</td>
</tr>
<tr>
<td>37”</td>
<td></td>
<td>04</td>
<td>fine grain sand, shell fragments, clay lenses, gray color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>end of core (~-14.5’ MLLW)</td>
</tr>
</tbody>
</table>
## Sediment Core Collection Form

**Station ID:** ABM-CS-5  
**Date:** 2-19-09

**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4

**Coordinates:**  
Lat/Northing: 33° 44.9388'  
Long/Easting: 118° 06.8274'

**Vertical Datum:** MLLW  
**Other:** MLW

**Depth Measurement:** Sounder  
**Leadline**

**Project Depth** 12'  
**Overdredge** 2'

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Start:</td>
<td>2:30</td>
<td></td>
</tr>
</tbody>
</table>

- **(A) Measured Water Depth:** 10.7'
- **(B) Tide Height:** 0.4'
- **(C) Mudline Elevation:** -10.2'

\[\text{(-A+B = C include sign of tide height as reported)}\]

**Estimated Penetration Length:** 4'

**Description of Core Drive:** Soft, easy push

**Refusal Encountered?** No

**Total Core Recover Length:** 3.9'

**Time End:**

---

### Core Characteristics

**Sediment Type**  
- cobble, gravel, sand C M F , silt clay, organic matter

**Sediment Color**  
- gray, black, brown brown surface, olivine

**Sediment Odor**  
- None, slight, mod, strong H₂S, petroleum, septic

**Any Layering Homogeneous**  
- Homogeneous

**Comments:**  
Color lightens with depth of core

---

**Recorded by:** BAG, TLS
### Visual Classification of Subsurface Core

<table>
<thead>
<tr>
<th>Job No.</th>
<th>080482-01 BG03 T4</th>
<th>Date</th>
<th>2.19.09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration/Core No.</td>
<td>ABM-CS-5</td>
<td>Core Pushed By</td>
<td>TEG</td>
</tr>
<tr>
<td>Water Depth</td>
<td>10.2’</td>
<td>Core Logged By</td>
<td>TLS, BJ, JM (ABC)</td>
</tr>
<tr>
<td>Mudline Elevation</td>
<td>-10.2’</td>
<td>Type of Core</td>
<td>Metro- Shelby Core</td>
</tr>
<tr>
<td>Penetration Length (feet)</td>
<td>4</td>
<td>Diameter of Core (inches)</td>
<td>4</td>
</tr>
<tr>
<td>Core Recovery (feet)</td>
<td>3.9</td>
<td>Core Quality</td>
<td>Good, Fair, Poor, Disturbed</td>
</tr>
<tr>
<td>Average % Compaction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Classification and Remarks**

- *Color, Consistency, Moisture, Grain Size, Sheen, Odor*

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Core Sections**
  - **Theoretical Depth**: 45"
  - **Actual Depth**: 45"

- **Core Sections**
  - **Sample Interval**: 05
  - **Sample Analytes**: ABM-CS-5
  - **Remarks**: Fine grain sand, gray color
  - **End of Core (~14' MLLW)**

- **Remarks**
  - Very slight odor, fine sandy silt dark gray to a lighter gray as core deepens
### Sediment Core Collection Form

**Station ID:** ABM-CS-6  
**Date:** 2-19-09  
**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4  
**Coordinates:**  
Lat/Northing: 33° 44.9670'  
Long/Easting: 118° 06.7977'  
**Vertical Datum:** MLLW  
**Depth Measurement:** Sounder, Leadline  
**Depth:** Sounder, Leadline  
**Overdredge:** 2'

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Start:</strong></td>
<td>3:00</td>
<td>3:45</td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>9.7’</td>
<td>13.5’</td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>0.7’</td>
<td>1.1’</td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-9.0’</td>
<td>-12.4’</td>
</tr>
</tbody>
</table>

(-A+B = C include sign of tide height as reported)

**Estimated Penetration Length:** 5’ 2’ 3.5’

**Description of Core Drive:** Soft, easy push

**Refusal Encountered?** No

**Total Core Recover Length:** 0’ 1.6’ 3.5’

**Time End:** 3:40 4:15

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobble, gravel, sand C M F, silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>cobble, gravel, sand C M F, silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Layering</td>
</tr>
<tr>
<td>cobble, gravel, sand C M F, silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Layering</td>
</tr>
</tbody>
</table>

**Comments:**

- Attempt 1: Lost core tube in mud
- Attempt 2: Short length

**Recorded by:** BAG, TLS
### Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Date** 2.19.09

**Job No.** 080482-01 BG03 T4  
**Core Pushed By** TEG

**Exploration/Core No.** ABM-CS-6  
**CoreLogged By** TLS, BJ, JM (ABC)

**Water Depth** 13.8’  
**Type of Core**  
- [ ] Shelby
- [ ] Piston Core
- [ ] Other- Vibracore

**Mudline Elevation** -12.0’  
**Diameter of Core (inches)** 4

**Penetration Length (feet)** 3.5  
**Core Quality**  
- [ ] Good
- [ ] Fair
- [ ] Poor
- [ ] Disturbed

**Core Recovery (feet)** 3.5  
**Average % Compaction =**

### Classification and Remarks

**Depth in (ft.)**

<table>
<thead>
<tr>
<th>Core Sections</th>
<th>Theoretical Depth</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1</td>
<td></td>
<td>silt, no odor, dark gray color</td>
</tr>
<tr>
<td>02</td>
<td>20&quot;</td>
<td></td>
<td>wood debris at 14&quot;</td>
</tr>
<tr>
<td>03</td>
<td>2</td>
<td></td>
<td>silt, olive green color</td>
</tr>
<tr>
<td>04</td>
<td>3</td>
<td></td>
<td>fine grain sand, bottom v-shaped fine sandy silt between 39.5&quot; and 42&quot;</td>
</tr>
<tr>
<td>04</td>
<td>42&quot;</td>
<td></td>
<td>end of core (~15.5’ MLLW)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Sediment Core Collection Form

**Station ID:** ABM-CS-7  
**Date:** 2-19-09

**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4

**Coordinates:**  
- **Lat/Northing:** 33° 44.8885'  
- **Long/Easting:** 118° 06.8516'

**Vertical Datum**  
- **MLLW**

**Depth Measurement**  
- Sounder  
- **Leadline**

**Project Depth**  
- 15'  
- **Overdredge**  
- 2'

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Start:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>14.0'</td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>3.0'</td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-11.0'</td>
<td></td>
</tr>
</tbody>
</table>

(-A+B = C include sign of tide height as reported)

**Estimated Penetration Length**  
- 6'

**Description of Core Drive**  
- Hard at end of drive

**Refusal Encountered?**  
- No

**Total Core Recover Length**  
- 6.2'

<table>
<thead>
<tr>
<th>Time End:</th>
<th></th>
</tr>
</thead>
</table>

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering Homogeneous</th>
<th>Comments:</th>
</tr>
</thead>
</table>
| cobble, gravel, sand C M F, silt clay, organic matter | gray, black, brown brown surface, olivine | None, slight, mod, strong H₂S, petroleum, septic | Layerings | Shell fragments throughout core  
Clay at bottom of core |

**Recorded by:** JM (ABC), TLS
# Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Job No.** 080482-01 BG03 T4  
**Date** 2.19.09  
**Core Pushed By** TEG  
**Core Logged By** TLS, BJ, JM (ABC)  
**Water Depth** 14.0'  
**Mudline Elevation** -11.0'  
**Penetration Length (feet)** 6  
**Core Recovery (feet)** 6.2  
**Diameter of Core (inches)** 4  
**Type of Core**  
- [ ] Shelby  
- [X] Piston Core  
- [ ] Other - Vibracore  
**Core Quality**  
- [X] Good  
- [ ] Fair  
- [ ] Poor  
- [ ] Disturbed  
**Average % Compaction =**

### Classification and Remarks

<table>
<thead>
<tr>
<th>Core Sections</th>
<th>Theoretical Depth in (ft.)</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1</td>
<td></td>
<td></td>
<td>fine sandy silt, moderate hydrocarbon odor, dark gray color, shell fragments</td>
</tr>
<tr>
<td>02</td>
<td>25&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>51.6&quot;</td>
<td></td>
<td></td>
<td>medium grain sand, gray color, shell fragments</td>
</tr>
<tr>
<td>04</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>56&quot;</td>
<td></td>
<td></td>
<td>medium grain sand with clay, gray color, shells</td>
</tr>
<tr>
<td>06</td>
<td>74&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Classification and Remarks:**

- (Color, Consistency, Moisture, Grain Size, Sheen, Odor)

**Core Sections:**

- **01:** 51.6" 
- **02:** 25" 
- **03:** 56" 
- **04:** 5" 
- **05:** 51.6" 
- **06:** 74" 

**Sample Analytes:**

- fine sandy silt, moderate hydrocarbon odor, dark gray color, shell fragments
- medium grain sand, gray color, shell fragments
- medium grain sand with clay, gray color, shells
- end of core (~17' MLLW)
**Sediment Core Collection Form**

<table>
<thead>
<tr>
<th>Station ID:</th>
<th>ABM-CS-7</th>
<th>Date:</th>
<th>2-19-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Alamitos Bay Marina Basin 1</td>
<td>Project Number:</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Coordinates:</td>
<td>Lat/Northing: 33° 44.8885'</td>
<td>Long/Easting:</td>
<td>118° 06.8516'</td>
</tr>
<tr>
<td>Vertical Datum:</td>
<td>MLLW</td>
<td>MLW Other:</td>
<td></td>
</tr>
<tr>
<td>Depth Measurement:</td>
<td>Sounder</td>
<td>Leadline</td>
<td></td>
</tr>
<tr>
<td>Project Depth</td>
<td>15'</td>
<td>Overdredge</td>
<td>2'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Start:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>14.0'</td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>3.0'</td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-11.0'</td>
<td></td>
</tr>
<tr>
<td>(-A+B = C include sign of tide height as reported)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Penetration Length</td>
<td>6'</td>
<td></td>
</tr>
<tr>
<td>Description of Core Drive</td>
<td>Hard at end of drive</td>
<td></td>
</tr>
<tr>
<td>Refusal Encountered?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Total Core Recover Length</td>
<td>6.2'</td>
<td></td>
</tr>
<tr>
<td>Time End:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>cobble, gravel, sand C M F , silt clay, organic matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Color</td>
<td>gray, black, brown brown surface, olivine</td>
</tr>
<tr>
<td>Sediment Odor</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
</tr>
<tr>
<td>Any Layering Homogeneous</td>
<td>Layerings</td>
</tr>
</tbody>
</table>

**Comments:**

- Shell fragments throughout core
- Clay at bottom of core

**Recorded by:** JM (ABC), TLS
## Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Job No.** 080482-01 BG03 T4  
**Date** 2.20.09  
**Core Pushed By** TEG  
**Core Logged By** TLS, BJ, JM (ABC)  
**Type of Core**  
- [ ] Shelby  
- [ ] Piston Core  
- [ ] Other-Vibracore  
**Mudline Elevation** -12.6'  
**Penetration Length (feet)** 6  
**Core Recovery (feet)** 6  
**Diameter of Core (inches)** 4

### Classification and Remarks

<table>
<thead>
<tr>
<th>Depth in (ft.)</th>
<th>Theoretical</th>
<th>Actual</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
<th>Classification and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fine sandy silt, dark gray color, no odor, shell fragment at 10&quot;</td>
</tr>
<tr>
<td>29&quot;</td>
<td></td>
<td>02</td>
<td></td>
<td></td>
<td>medium grain sand, no odor, dark gray color</td>
</tr>
<tr>
<td>57&quot;</td>
<td></td>
<td>03</td>
<td></td>
<td></td>
<td>course grain sand with clay mixed throughout, no odor, dark gray color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>04</td>
<td></td>
<td></td>
<td>mixed vegetation throughout</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>end of core (~ -18.5' MLLW)</td>
</tr>
</tbody>
</table>
**Sediment Core Collection Form**

**Station ID:** ABM-CS-9  
**Date:** 2-20-09

**Project Name:** Alamitos Bay Marina Basin 1  
**Project Number:** 080482-01 BG03 T4

**Coordinates:**  
Lat/Northing: 33° 45.0400'  
Long/Easting: 118° 06.8186'

**Vertical Datum:** MLLW  
**Other:** MLW

**Depth Measurement:**  
Sounder  
Leadline

**Project Depth** 12'  
**Overdredge** 2'

<table>
<thead>
<tr>
<th>Attempt 1</th>
<th>Attempt 2</th>
<th>Attempt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Start:</strong></td>
<td>8:45</td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>15.1'</td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>3.3'</td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-11.8'</td>
<td></td>
</tr>
<tr>
<td>(-A+B = C include sign of tide height as reported)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Penetration Length</td>
<td>3'</td>
<td></td>
</tr>
<tr>
<td>Description of Core Drive</td>
<td>Easy push</td>
<td></td>
</tr>
<tr>
<td>Refusal Encountered?</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Total Core Recover Length</td>
<td>2.8'</td>
<td></td>
</tr>
<tr>
<td><strong>Time End:</strong></td>
<td>9:45</td>
<td></td>
</tr>
</tbody>
</table>

**Core Characteristics**

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering Homogeneous</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobble, gravel, sand C M F , silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Homogeneous</td>
<td>Cored too much, removed bottom 1’ on boat, dark fine sandy silt</td>
</tr>
<tr>
<td>cobble, gravel, sand C M F , silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td></td>
<td>Relocated core due to deep depth at original location</td>
</tr>
<tr>
<td>cobble, gravel, sand C M F , silt clay, organic matter</td>
<td>gray, black, brown brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recorded by:** DWF, TLS
# Visual Classification of Subsurface Core

**Job:** Alamitos Bay Marina Basin 1  
**Date:** 2.20.09

<table>
<thead>
<tr>
<th>Job No.</th>
<th>Exploration/Core No.</th>
<th>Water Depth</th>
<th>Mudline Elevation</th>
<th>Penetration Length (feet)</th>
<th>Core Recovery (feet)</th>
<th>Core Pushed By</th>
<th>Core Logged By</th>
<th>Type of Core</th>
<th>Diameter of Core (inches)</th>
<th>Core Quality</th>
<th>Average % Compaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>080482-01 BG03 T4</td>
<td>ABM-CS-9</td>
<td>15.1'</td>
<td>-11.8'</td>
<td>3</td>
<td>2.8</td>
<td>TEG</td>
<td>TLS, BJ, JM (ABC)</td>
<td>Other-Vibracore</td>
<td>4</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>

**Classification and Remarks**

(Color, Consistency, Moisture, Grain Size, Sheen, Odor)

<table>
<thead>
<tr>
<th>Depth in (ft.)</th>
<th>Core Sections</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>01</td>
<td></td>
<td>fine sandy silty, dark gray color, slight sulfuric odor</td>
</tr>
<tr>
<td>2</td>
<td>02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>03</td>
<td></td>
<td>shell fragments at 30&quot;</td>
</tr>
<tr>
<td>34&quot;</td>
<td></td>
<td></td>
<td>end of core (~ 15' MLLW)</td>
</tr>
</tbody>
</table>
## Sediment Core Collection Form

<table>
<thead>
<tr>
<th>Station ID:</th>
<th>ABM-CS-10</th>
<th>Date:</th>
<th>2-20-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Alamitos Bay Marina Basin 1</td>
<td>Project Number:</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Coordinates:</td>
<td>Lat/Northing 33° 45.0070'</td>
<td>Long/Easting:</td>
<td>118° 06.8391'</td>
</tr>
<tr>
<td>Vertical Datum</td>
<td>MLLW</td>
<td>MLW</td>
<td>Other:</td>
</tr>
<tr>
<td>Depth Measurement</td>
<td>Sounder</td>
<td>Leadline</td>
<td></td>
</tr>
<tr>
<td>Project Depth</td>
<td>12’</td>
<td>Overdredge</td>
<td>2’</td>
</tr>
<tr>
<td>Time Start:</td>
<td>10:35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A) Measured Water Depth</td>
<td>14.1’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B) Tide Height</td>
<td>2.0’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) Mudline Elevation</td>
<td>-12.1’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Penetration Length</td>
<td>4’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description of Core Drive</td>
<td>Easy push</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refusal Encountered?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Core Recover Length</td>
<td>3.25’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time End:</td>
<td>11:00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Core Characteristics

| Sediment Type | cobble, gravel, sand C M F , silt clay, organic matter | cobble, gravel, sand C M F , silt clay, organic matter | cobble, gravel, sand C M F , silt clay, organic matter |
| Sediment Color | gray, black, brown brown surface, olivine | gray, black, brown brown surface, olivine | gray, black, brown brown surface, olivine |
| Sediment Odor | None, slight, mod, strong H₂S, petroleum, septic | None, slight, mod, strong H₂S, petroleum, septic | None, slight, mod, strong H₂S, petroleum, septic |
| Any Layering Homogeneous | Homogeneous | |

### Comments:

Relocated due to original location being too deep

Recorded by: DWF, TLS
**Visual Classification of Subsurface Core**

<table>
<thead>
<tr>
<th>Job</th>
<th>Alamitos Bay Marina Basin 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job No.</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Exploration/Core No.</td>
<td>ABM-CS-10</td>
</tr>
<tr>
<td>Date</td>
<td>2.20.09</td>
</tr>
<tr>
<td>Core Pushed By</td>
<td>TEG</td>
</tr>
<tr>
<td>Core Logged By</td>
<td>TLS, BJ, JM (ABC)</td>
</tr>
<tr>
<td>Type of Core</td>
<td>□ Shelby □ Piston Core □ Other-Vibracore</td>
</tr>
<tr>
<td>Diameter of Core (inches)</td>
<td>4</td>
</tr>
<tr>
<td>Mudline Elevation</td>
<td>-12.1’</td>
</tr>
<tr>
<td>Penetration Length (feet)</td>
<td>4</td>
</tr>
<tr>
<td>Core Recovery (feet)</td>
<td>3.25</td>
</tr>
<tr>
<td>Core Quality</td>
<td>□ Good □ Fair □ Poor □ Disturbed</td>
</tr>
<tr>
<td>Average % Compaction</td>
<td>=</td>
</tr>
</tbody>
</table>

**Classification and Remarks**

<table>
<thead>
<tr>
<th>Depth in (ft.)</th>
<th>Core Sections</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35”</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>39”</td>
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<td></td>
</tr>
<tr>
<td>3</td>
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<td></td>
<td></td>
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<tr>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>5</td>
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<td></td>
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<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Fine sandy silt, slight sulfuric odor, dark gray color
- Shell at 26.5”
- Fine grain sand
- End of core (~ -15.5’ MLLW)
**Sediment Core Collection Form**


<table>
<thead>
<tr>
<th>Station ID:</th>
<th>ABM-CS-11</th>
<th>Date:</th>
<th>2-20-09</th>
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</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Alamitos Bay Marina Basin 1</td>
<td>Project Number:</td>
<td>080482-01 BG03 T4</td>
</tr>
<tr>
<td>Coordinates:</td>
<td>Lat/Northing 33° 45.9641’</td>
<td>Long/Easting:</td>
<td>118° 06.8395’</td>
</tr>
<tr>
<td>Vertical Datum</td>
<td>MLLW</td>
<td>MLW</td>
<td>Other:</td>
</tr>
<tr>
<td>Depth Measurement</td>
<td>Sounder</td>
<td>Leadline</td>
<td></td>
</tr>
<tr>
<td>Project Depth</td>
<td>12’</td>
<td>Overdredge</td>
<td>2’</td>
</tr>
</tbody>
</table>

| Time Start: | 11:28 |
| (A) Measured Water Depth | 12.7’ |
| (B) Tide Height | 1.0’ |
| (C) Mudline Elevation | -11.7’ |

\[(-A+B = C \text{ include sign of tide height as reported})\]

- Estimated Penetration Length: 4’
- Description of Core Drive: Easy push
- Refusal Encountered? No
- Total Core Recover Length: 3.5’
- Time End: 11:50

### Core Characteristics

<table>
<thead>
<tr>
<th>Sediment Type</th>
<th>cobble, gravel, sand C M F, silt clay, organic matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Color</td>
<td>gray, black, brown brown surface, olivine</td>
</tr>
<tr>
<td>Sediment Odor</td>
<td>None, slight, mod, strong H2S, petroleum, septic</td>
</tr>
<tr>
<td>Any Layering Homogeneous</td>
<td>Homogeneous</td>
</tr>
</tbody>
</table>

**Comments:**

Recorded by: DWF, TLS
# Visual Classification of Subsurface Core

**Job** Alamitos Bay Marina Basin 1  
**Date** 2.20.09  
**Core Pushed By** TEG

### Details
- **Job No.** 080482-01 BG03 T4  
- **Core No.** ABM-CS-11  
- **Water Depth** 12.7’  
- **Mudline Elevation** -11.7’  
- **Penetration Length (feet)** 4  
- **Core Recovery (feet)** 3.5

### Core Quality
- **Core Quality** □ Good  □ Fair  □ Poor  □ Disturbed  
- **Diameter of Core (inches)** 4

### Core Sections

<table>
<thead>
<tr>
<th>Theoretical Depth (ft.)</th>
<th>Sample Interval</th>
<th>Sample Analytes</th>
<th>Classification and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td>fine sandy silt, dark gray color, slight sulfuric odor</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td>piece of black plastic at 18”</td>
</tr>
<tr>
<td>42”</td>
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<td></td>
<td>end of core (~ -16’ MLLW)</td>
</tr>
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</table>

### Analytes

- **Analytes Sample**

Average % Compaction =
Station ID: ABM-CS-12    Date: 2-20-09

Project Name: Alamitos Bay Marina Basin 1    Project Number: 080482-01 BG03 T4

Coordinates: Lat/Northing: 33° 44.9461'    Long/Easting: 118° 06.9027'

Vertical Datum: MLLW

Depth Measurement: Sounder

MLLW

Project Depth: 15’    Overdredge: 2’

Time Start: 12:00

(A) Measured Water Depth: 11.9’
(B) Tide Height: 0.5’
(C) Mudline Elevation: -11.4’

\(-A+B = C\) include sign of tide height as reported

Estimated Penetration Length: 7’

Description of Core Drive: Easy push

Refusal Encountered: Yes, at 7’

Total Core Recover Length: 7’

Time End: 12:27

Core Characteristics

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<tr>
<th>Sediment Type</th>
<th>Sediment Color</th>
<th>Sediment Odor</th>
<th>Any Layering</th>
<th>Comments</th>
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<tbody>
<tr>
<td>cobble, gravel, sand, silt, clay, organic matter</td>
<td>gray, black, brown, brown surface, olivine</td>
<td>None, slight, mod, strong H₂S, petroleum, septic</td>
<td>Homogeneous</td>
<td>Some shells and shell fragments throughout core</td>
</tr>
</tbody>
</table>

Recorded by: DWF, TLS
**Visual Classification of Subsurface Core**

<table>
<thead>
<tr>
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<th>Date 2.20.09</th>
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</thead>
<tbody>
<tr>
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<td>TEG</td>
</tr>
<tr>
<td>Exploration/Core No. ABM-CS-12</td>
<td>TLS, BJ, JM (ABC)</td>
</tr>
<tr>
<td>Water Depth 11.9'</td>
<td>4</td>
</tr>
<tr>
<td>Mudline Elevation -11.4'</td>
<td></td>
</tr>
<tr>
<td>Penetration Length (feet) 7</td>
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<tr>
<td>Core Recovery (feet) 7</td>
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<tr>
<td>Core Quality Good</td>
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<tr>
<td>Core Recovery %</td>
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<tr>
<td>Average % Compaction =</td>
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<tr>
<th>Type of Core</th>
<th>Shelby</th>
<th>Piston Core</th>
<th>Other-Vibracore</th>
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<tr>
<td>Diameter of Core (inches)</td>
<td>4</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>fine sandy silt, slight sulfuric odor, dark gray color, shell at the top</td>
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<tr>
<td>02</td>
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<tr>
<td>03</td>
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<tr>
<td>04</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>shell fragment at 60&quot;</td>
</tr>
<tr>
<td>06</td>
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<tr>
<td>81&quot;</td>
<td>fine grain sand, gray color, slight odor</td>
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<td></td>
<td>end of core (~ -18.5' MLLW)</td>
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<tr>
<td>7</td>
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<td>8</td>
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APPENDIX B
LABTORATORY DATA PACKAGE
February 27, 2009

Scott Johnson
Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Subject: Calscience Work Order No.: 09-02-1819
Client Reference: Alamitos Bay Marina Basin

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/19/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Robert Stearns
Project Manager

Calscience Environmental Laboratories, Inc.
### Analytical Report

**Aquatic Bioassay & Consulting Laboratories**  
29 North Olive Street  
Ventura, CA 93001-2552  
Date Received: 02/19/09  
Work Order No: 09-02-1819  
Preparation: EPA 7471A Total  
Method: EPA 7471A

**Project: Alamitos Bay Marina Basin**

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<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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- Results are reported on a dry weight basis.

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- Results are reported on a dry weight basis.

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- Results are reported on a dry weight basis.

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- Results are reported on a dry weight basis.

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- Results are reported on a dry weight basis.

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<td>Qual</td>
<td>mg/kg</td>
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</tbody>
</table>

**7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL:(714) 895-5494 • FAX: (714) 894-7501**
<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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**RL** - Reporting Limit, **DF** - Dilution Factor, **Qual** - Qualifiers

- Results are reported on a dry weight basis.
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<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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-Results are reported on a dry weight basis.

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | 0.0487 | 0.0316 | 1  | Qual | mg/kg |

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | ND     | 0.0281 | 1  | Qual | mg/kg |

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | 0.242  | 0.0284 | 1  | Qual | mg/kg |

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | ND     | 0.0261 | 1  | Qual | mg/kg |

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | ND     | 0.0253 | 1  | Qual | mg/kg |

Parameter  | Result | RL  | DF | Qual | Units |
-----------|--------|-----|----|------|-------|
Mercury    | 0.277  | 0.0347 | 1  | Qual | mg/kg |

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers
## Project: Alamitos Bay Marina Basin

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- Results are reported on a dry weight basis.

Parameter: Mercury

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers
### Project: Alamitos Bay Marina Basin

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- Results are reported on a dry weight basis.

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RL - Reporting Limit  
DF - Dilution Factor  
Qual - Qualifiers  

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL:(714) 895-5494 • FAX: (714) 894-7501
### Project: Alamitos Bay Marina Basin

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- Results are reported on a dry weight basis.

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | 0.0575 | 0.0285 | 1 |   | mg/kg |

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | 0.387 | 0.0363 | 1 |   | mg/kg |

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | 2.03  | 0.0337 | 1 |   | mg/kg |

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | 2.38  | 0.0315 | 1 |   | mg/kg |

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | ND    | 0.0266 | 1 |   | mg/kg |

Parameter | Result | RL  | DF | Qual | Units |
---|---|---|---|---|---|
Mercury   | ND    | 0.0200 | 1 |   | mg/kg |

RL - Reporting Limit ,  DF - Dilution Factor ,  Qual - Qualifiers
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### Project: Alamitos Bay Marina Basin

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**Notes:**
- **RL** - Reporting Limit
- **DF** - Dilution Factor
- **Qual** - Qualifiers
# Analytical Report

## Project: Alamitos Bay Marina Basin

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### Project: Alamitos Bay Marina Basin

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**RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers**

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL: (714) 895-5494 • FAX: (714) 894-7501
## Analytical Report

### Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

**Date Received:** 02/19/09  
**Work Order No:** 09-02-1819

**Project:** Alamitos Bay Marina Basin

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**RL** - Reporting Limit  
**DF** - Dilution Factor  
**Qual** - Qualifiers

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**RL** - Reporting Limit, **DF** - Dilution Factor, **Qual** - Qualifiers
# Analytical Report

**Aquatic Bioassay & Consulting Laboratories**  
29 North Olive Street  
Ventura, CA 93001-2552

**Date Received:** 02/19/09  
**Work Order No:** 09-02-1819

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**Project:** Alamitos Bay Marina Basin

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**RL** - Reporting Limit, **DF** - Dilution Factor, **Qual** - Qualifiers
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**Project:** Alamitos Bay Marina Basin

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<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date Collected</th>
<th>Matrix</th>
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<tbody>
<tr>
<td>Method Blank</td>
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<table>
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<tr>
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<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
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<th>Date Analyzed</th>
<th>Method</th>
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<tbody>
<tr>
<td>Solids, Total</td>
<td>ND</td>
<td>0.100</td>
<td>1</td>
<td>%</td>
<td>%</td>
<td>02/25/09</td>
<td>02/25/09</td>
<td>SM 2540 B</td>
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<tr>
<td>Solids, Total</td>
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<td>1</td>
<td>%</td>
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<td>02/25/09</td>
<td>02/25/09</td>
<td>SM 2540 B</td>
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</tbody>
</table>

**Notes:** RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers
Quality Control - Spike/Spike Duplicate

Project  Alamitos Bay Marina Basin

<table>
<thead>
<tr>
<th>Quality Control Sample ID</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date Analyzed</th>
<th>MS/MSD Batch Number</th>
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<tr>
<td>ABM-CS-1-03</td>
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<th>MSD %REC</th>
<th>%REC CL</th>
<th>RPD</th>
<th>RPD CL</th>
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<td>96</td>
<td>104</td>
<td>76-136</td>
<td>8</td>
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RPD - Relative Percent Difference  
CL - Control Limit
Aquatic Bioassay & Consulting Laboratories  
29 North Olive Street  
Ventura, CA 93001-2552  

Quality Control - Spike/Spike Duplicate  

Date Received: 02/19/09  
Work Order No: 09-02-1819  
Preparation: EPA 7471A Total  
Method: EPA 7471A  

Project  Alamitos Bay Marina Basin  

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<th>Date Analyzed</th>
<th>MS/MSD Batch Number</th>
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<th>%REC CL</th>
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<th>RPD CL</th>
<th>Qualifiers</th>
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RPD - Relative Percent Difference  
CL - Control Limit
Project: Alamitos Bay Marina Basin

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<th>Date Analyzed</th>
<th>Sample Conc</th>
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Aquatic Bioassay & Consulting Laboratories 29 North Olive Street Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1819
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

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<th>Quality Control Sample ID</th>
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<th>Date Analyzed</th>
<th>LCS/LCSD Batch Number</th>
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</table>

RPD - Relative Percent Difference , CL - Control Limit
Aquatic Bioassay & Consulting Laboratories  
29 North Olive Street  
Ventura, CA 93001-2552

Date Received: N/A  
Work Order No: 09-02-1819  
Preparation: EPA 7471A Total  
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

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<th>LCS %REC</th>
<th>LCSD %REC</th>
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<td>Solid</td>
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<td>104</td>
<td>82-124</td>
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</table>

RPD - Relative Percent Difference, CL - Control Limit
## Glossary of Terms and Qualifiers

**Work Order Number:** 09-02-1819

<table>
<thead>
<tr>
<th>Qualifier</th>
<th>Definition</th>
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<tbody>
<tr>
<td>*</td>
<td>See applicable analysis comment.</td>
</tr>
<tr>
<td>1</td>
<td>Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>2</td>
<td>Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>3</td>
<td>Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>4</td>
<td>The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>5</td>
<td>The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.</td>
</tr>
<tr>
<td>A</td>
<td>Result is the average of all dilutions, as defined by the method.</td>
</tr>
<tr>
<td>B</td>
<td>Analyte was present in the associated method blank.</td>
</tr>
<tr>
<td>C</td>
<td>Analyte presence was not confirmed on primary column.</td>
</tr>
<tr>
<td>E</td>
<td>Concentration exceeds the calibration range.</td>
</tr>
<tr>
<td>H</td>
<td>Sample received and/or analyzed past the recommended holding time.</td>
</tr>
<tr>
<td>J</td>
<td>Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.</td>
</tr>
<tr>
<td>ME</td>
<td>LCS Recovery Percentage is within LCS ME Control Limit range.</td>
</tr>
<tr>
<td>N</td>
<td>Nontarget Analyte.</td>
</tr>
<tr>
<td>ND</td>
<td>Parameter not detected at the indicated reporting limit.</td>
</tr>
<tr>
<td>Q</td>
<td>Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.</td>
</tr>
<tr>
<td>U</td>
<td>Undetected at the laboratory method detection limit.</td>
</tr>
<tr>
<td>X</td>
<td>% Recovery and/or RPD out-of-range.</td>
</tr>
<tr>
<td>Z</td>
<td>Analyte presence was not confirmed by second column or GC/MS analysis.</td>
</tr>
</tbody>
</table>
Laboratory Client: ABC Laboratories

Address: 29 N. Olive St
City: Ventura
State: CA
Zip: 93001

Client Project Name / Number: Alamitos Bay Marina Basin 1

Project Contact: Scott Johnson

Sampler(s): (Print) Jim Mann

COELT Log Code: 21819

Cooler Receipt: 

Temp: 

requested Analyses:

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Field Point Name (For COELT Edf)</th>
<th>Sampling Date</th>
<th>Sampling Time (Hr:Min)</th>
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Received by: (Signature/affiliation)  Date: 2/19/09  Time: 17:00
Received by: (Signature/affiliation)  Date: 2/19/09  Time: 17:40
Received by: (Signature/affiliation)  Date: 2/19/09  Time: 17:40

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

05/01/07 Revision
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<tr>
<th>LAB USE ONLY</th>
<th>SAMPLE ID</th>
<th>FIELD POINT NAME (FOR COELT EDF)</th>
<th>SAMPLING DATE</th>
<th>SAMPLING TIME</th>
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REQUESTED ANALYSES:
- TPH (g)
- TPH (t)
- TPH (t) or CE (C28)
- VOCs (6/26ОС)
- Oxygenates (8/26ОС)
- SVOCs (8/26ОС)
- PCBs (6/26)
- PnAs (6/26)
- T22 Metals (6/26)
- CTs (6/26)
- TPH (g) (6/26)
- Mercury (6/26)
- PAH (6/26)

Rein).: (Signature)  
Received by: (Signature/Address)  
Date: 02/19/09 Time: 17:00

Rein).: (Signature)  
Received by: (Signature/Address)  
Date: 02/19/09 Time: 17:40

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<th>PCBs (8062)</th>
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Relinquished by: (Signature)  
Received by: (Signature/Affiliation)  
Date: 02/19/09  
Time: 17:00

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Received by: (Signature/Affiliation)  
Date: 02/19/09  
Time: 17:40

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05/01/07 Revision
WORK ORDER #: 09-02-1007

SAMPLE RECEIPT FORM

CLIENT: ABC

DATE: 02/19/09

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 1.4°C - 0.2°C (CF) = 1.2°C

☐ Blank  ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: ____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air  ☐ Filter  ☐ Metals Only  ☐ PCBs Only

Initial: W2

CUSTODY SEALS INTACT:

☐ Cooler ☐ No (Not Intact) ☐ Not Present ☐ N/A  Initial: W2

☐ Sample ☐ No (Not Intact) ☐ Not Present  Initial: YL

SAMPLE CONDITION:

Chain-Of-Custody (COC) document(s) received with samples…….. ☑ ☐ ☐

COC document(s) received complete........................................... ☐ ☑ ☐

Sampler's name indicated on COC............................................ ☑ ☐ ☐

Sample container label(s) consistent with COC........................... ☐ ☐ ☐

Sample container(s) intact and good condition.......................... ☐ ☐ ☐

Correct containers and volume for analyses requested................... ☑ ☐ ☐

Analyses received within holding time..................................... ☑ ☐ ☐

Proper preservation noted on COC or sample container............... ☑ ☐ ☑

Volatile analysis container(s) free of headspace........................... ☑ ☐ ☐

Tedlar bag(s) free of condensation........................................... ☑ ☐ ☑

CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve ☐ EnCores® ☐ TerraCores® ☐ ________

Water: ☐ VOA ☐ VOAh ☐ VOAna2 ☐ 125AGB ☐ 125AGBh ☐ 125AGBpO4 ☐ 1AGB ☐ 1AGBna2

☐ 1AGBs ☐ 500AGB ☐ 500AGBs ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 500PB ☐ 500PBNa ☐ 250PB

☐ 250PBN ☐ 125PB ☐ 125PBna2 ☐ 100PBsterile ☐ 100PBNa2 ☐ ________ ☐ ________ ☐ ________

Air: ☐ Tedlar® ☐ Summa® ☐ ________  Checked/Labeled by: YL


Preservative: h:HCLO n:HNO3 na2:Na3S2O3 na:NaOH po4:H3PO4 s:H2SO4 znna:ZnAc2+NaOH

Reviewed by: YL  Scanned by: YL

SOP T100_090 (12/10/08)
**SAMPLE ANOMALY FORM**

**CHAIN OF CUSTODY (COC):**
- □ Not relinquished by client – no signature
- □ No date/time relinquished
- □ COC not received with samples – notify PM
- ☑ Incomplete information regarding samples, tests, etc.

**Comments:**

Received 1 oz jar for each sample.

---

**SAMPLES - CONTAINERS & LABELS:**
- □ Samples NOT RECEIVED but listed on COC
- □ Samples received but NOT LISTED on COC
- □ Holding time expired – list sample ID(s) and test
- □ Insufficient quantities for analysis – list test
- □ Improper container(s) used – list test
- □ No preservative noted on label – list test and notify lab
- □ Sample labels illegible – note test/container type
- □ Sample labels do not match COC – Note in comments
  - □ Sample ID
  - □ Date and Time Collected
  - □ Project Information
  - □ # of containers
- □ Sample containers compromised – Note in comments
  - □ Leaking
  - □ Broken
  - □ Without Labels
- □ Other:

**Comment:**

---

**HEADSPACE – Containers with Bubble > 6mm or ¼ inch:**

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of Vials Received</th>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of Vials Received</th>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of RS KO2 or DD or Organic Lead Received</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

---

Initial / Date: 2/19/09

---

**SOP T100_081 (09/19/08)**
February 27, 2009

Scott Johnson
Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Subject: Calscience Work Order No.: 09-02-1922
Client Reference: Alamitos Bay Marina Basin

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/20/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental Laboratories, Inc.
Robert Stearns
Project Manager
## Analytical Report

Aquatic Bioassay & Consulting Laboratories  
29 North Olive Street  
Ventura, CA 93001-2552  

---

**Project:** Alamitos Bay Marina Basin  

### Client Sample Number

<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABM-CS-8-01</td>
<td>09-02-1922-1-A</td>
<td>02/20/09 08:45</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 02:23</td>
<td>090220L06</td>
</tr>
</tbody>
</table>

- Results are reported on a dry weight basis.

**Parameter**  

<table>
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<tr>
<th>Mercury</th>
<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
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<tbody>
<tr>
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<td>0.0348</td>
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<td>mg/kg</td>
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Mercury  
02/20/09 02/20/09 02:26  
090220L06  

- Results are reported on a dry weight basis.

**Parameter**  

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<td>0.0333</td>
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| ABM-CS-8-03  
09-02-1922-3-A  
02/20/09 08:45  
Solid  
Mercury  
02/20/09 02/20/09 02:28  
090220L06  

- Results are reported on a dry weight basis.

**Parameter**  

<table>
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<th>DF</th>
<th>Qual</th>
<th>Units</th>
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<td>0.0283</td>
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<td>Qual</td>
<td>mg/kg</td>
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| ABM-CS-8-04  
09-02-1922-4-A  
02/20/09 08:45  
Solid  
Mercury  
02/20/09 02/20/09 02:30  
090220L06  

- Results are reported on a dry weight basis.

**Parameter**  

<table>
<thead>
<tr>
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<th>DF</th>
<th>Qual</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ND</td>
<td>0.0266</td>
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<td>Qual</td>
<td>mg/kg</td>
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| ABM-CS-9-01  
09-02-1922-5-A  
02/20/09 10:02  
Solid  
Mercury  
02/20/09 02/20/09 02:37  
090220L06  

- Results are reported on a dry weight basis.

**Parameter**  

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<thead>
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<th>DF</th>
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<th>Units</th>
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<td></td>
<td>0.692</td>
<td>0.0428</td>
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<td>mg/kg</td>
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| ABM-CS-9-02  
09-02-1922-6-A  
02/20/09 10:02  
Solid  
Mercury  
02/20/09 02/20/09 02:39  
090220L06  

- Results are reported on a dry weight basis.

**Parameter**  

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<th>Units</th>
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<td>0.0359</td>
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<td>mg/kg</td>
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</table>
### Project: Alamitos Bay Marina Basin

<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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<tbody>
<tr>
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<td>09-02-1922-7-A</td>
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<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:41</td>
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<tr>
<td>ABM-CS-10-01</td>
<td>09-02-1922-8-A</td>
<td>02/20/09 11:15</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:43</td>
<td>090220L06</td>
</tr>
<tr>
<td>ABM-CS-10-02</td>
<td>09-02-1922-9-A</td>
<td>02/20/09 11:15</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:46</td>
<td>090220L06</td>
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<td>ABM-CS-11-01</td>
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<td>02/20/09 11:58</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:48</td>
<td>090220L06</td>
</tr>
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<td>ABM-CS-11-02</td>
<td>09-02-1922-11-A</td>
<td>02/20/09 11:38</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:50</td>
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<tr>
<td>ABM-CS-12-01</td>
<td>09-02-1922-12-A</td>
<td>02/20/09 12:40</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
<td>02/20/09 20:52</td>
<td>090220L06</td>
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</tbody>
</table>

**Results are reported on a dry weight basis.**

<table>
<thead>
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<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>1.83</td>
<td>0.0389</td>
<td>1</td>
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<td>mg/kg</td>
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<tr>
<td>Mercury</td>
<td>0.205</td>
<td>0.0336</td>
<td>1</td>
<td></td>
<td>mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>ND</td>
<td>0.0316</td>
<td>1</td>
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<td>mg/kg</td>
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<tr>
<td>Mercury</td>
<td>0.183</td>
<td>0.0349</td>
<td>1</td>
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<td>Mercury</td>
<td>0.299</td>
<td>0.0330</td>
<td>1</td>
<td></td>
<td>mg/kg</td>
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<tr>
<td>Mercury</td>
<td>0.199</td>
<td>0.0340</td>
<td>1</td>
<td></td>
<td>mg/kg</td>
</tr>
</tbody>
</table>

- **RL** - Reporting Limit, **DF** - Dilution Factor, **Qual** - Qualifiers
### Project: Alamitos Bay Marina Basin

<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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</thead>
<tbody>
<tr>
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<td>09-02-1922-13-A</td>
<td>02/20/09 12:40</td>
<td>Solid</td>
<td>Mercury</td>
<td>02/20/09</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>02/20/09</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>02/20/09</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>02/20/09</td>
</tr>
<tr>
<td></td>
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</table>

-Results are reported on a dry weight basis.

<table>
<thead>
<tr>
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<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>0.288</td>
<td>0.0335</td>
<td>1</td>
<td>Qual</td>
<td>mg/kg</td>
</tr>
</tbody>
</table>

| ABM-CS-12-03         | 09-02-1922-14-A | 02/20/09 12:40 | Solid | Mercury | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 090220L06 |

-Results are reported on a dry weight basis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
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<td>0.0321</td>
<td>1</td>
<td>Qual</td>
<td>mg/kg</td>
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</table>

| ABM-CS-12-04         | 09-02-1922-15-A | 02/20/09 12:40 | Solid | Mercury | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 090220L06 |

-Results are reported on a dry weight basis.

<table>
<thead>
<tr>
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<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>ND</td>
<td>0.0344</td>
<td>1</td>
<td>Qual</td>
<td>mg/kg</td>
</tr>
</tbody>
</table>

| ABM-CS-12-05         | 09-02-1922-16-A | 02/20/09 12:40 | Solid | Mercury | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 090220L06 |

-Results are reported on a dry weight basis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>ND</td>
<td>0.0333</td>
<td>1</td>
<td>Qual</td>
<td>mg/kg</td>
</tr>
</tbody>
</table>

| ABM-CS-12-06         | 09-02-1922-17-A | 02/20/09 12:40 | Solid | Mercury | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 02/20/09 |
|                      |                |               |       |         | 090220L06 |

-Results are reported on a dry weight basis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>ND</td>
<td>0.0307</td>
<td>1</td>
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<table>
<thead>
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<th>099-12-452-96</th>
<th>N/A</th>
<th>Solid</th>
<th>Mercury</th>
<th>02/20/09</th>
</tr>
</thead>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>02/20/09</td>
</tr>
<tr>
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<table>
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<th>RL</th>
<th>DF</th>
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<th>Units</th>
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<tbody>
<tr>
<td>Mercury</td>
<td>ND</td>
<td>0.0200</td>
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<td>Qual</td>
<td>mg/kg</td>
</tr>
</tbody>
</table>
### Project: Alamitos Bay Marina Basin

#### Client Sample Number

<table>
<thead>
<tr>
<th>Lab Sample Number</th>
<th>Date/Time Collected</th>
<th>Matrix</th>
<th>Instrument</th>
<th>Date Prepared</th>
<th>Date/Time Analyzed</th>
<th>QC Batch ID</th>
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<tbody>
<tr>
<td><strong>Rinsate ABM-CS-9</strong></td>
<td>09-02-1922-18-A</td>
<td>02/20/09 16:20</td>
<td>Aqueous</td>
<td>Mercury</td>
<td>02/24/09 02/24/09 17:02</td>
<td>090224L02B</td>
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<td>09-02-1922-19-A</td>
<td>02/20/09 10:20</td>
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#### Parameter

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<td>Qual</td>
<td>mg/L</td>
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</tbody>
</table>

**RL** - Reporting Limit, **DF** - Dilution Factor, **Qual** - Qualifiers
<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
<th>Date Collected</th>
<th>Matrix</th>
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</thead>
<tbody>
<tr>
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<table>
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<th>DF</th>
<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
<th>Date Analyzed</th>
<th>Method</th>
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<tbody>
<tr>
<td>Solids, Total</td>
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<td>1</td>
<td>%</td>
<td></td>
<td>02/26/09</td>
<td>02/26/09</td>
<td>SM 2540 B</td>
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<table>
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</thead>
<tbody>
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<table>
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<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
<th>Date Analyzed</th>
<th>Method</th>
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<tbody>
<tr>
<td>Solids, Total</td>
<td>60.2</td>
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<td>1</td>
<td>%</td>
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<td>02/26/09</td>
<td>02/26/09</td>
<td>SM 2540 B</td>
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</table>

<table>
<thead>
<tr>
<th>Client Sample Number</th>
<th>Lab Sample Number</th>
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<th>Matrix</th>
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<tbody>
<tr>
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<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
<th>Date Analyzed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids, Total</td>
<td>70.9</td>
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<td>1</td>
<td>%</td>
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<td>02/26/09</td>
<td>SM 2540 B</td>
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</table>

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RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers
### Project: Alamitos Bay Marina Basin

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<td>09-02-1922-8</td>
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<td>09-02-1922-9</td>
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<td>%</td>
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<tr>
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<td>%</td>
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<td>Solids, Total</td>
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<td>%</td>
<td>02/26/09</td>
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<td>SM 2540 B</td>
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</table>

RL - Reporting Limit    
DF - Dilution Factor    
Qual - Qualifiers
### Project: Alamitos Bay Marina Basin

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<td>%</td>
<td>02/26/09</td>
<td>02/26/09</td>
<td>SM 2540 B</td>
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</table>

| ABM-CS-12-01 | 09-02-1922-12 | 02/20/09 | Solid | Solids, Total | 58.9 | 0.100| 1 | %    | 02/26/09       | 02/26/09       | SM 2540 B   |

<table>
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<tr>
<th>Parameter</th>
<th>Result</th>
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<th>DF</th>
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<th>Units</th>
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<td>SM 2540 B</td>
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| ABM-CS-12-02 | 09-02-1922-13 | 02/20/09 | Solid | Solids, Total | 59.8 | 0.100| 1 | %    | 02/26/09       | 02/26/09       | SM 2540 B   |

<table>
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<th>DF</th>
<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
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<th>Method</th>
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<tbody>
<tr>
<td>Solids, Total</td>
<td>59.8</td>
<td>0.100</td>
<td>1</td>
<td>%</td>
<td>02/26/09</td>
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<td>SM 2540 B</td>
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| ABM-CS-12-03 | 09-02-1922-14 | 02/20/09 | Solid | Solids, Total | 62.4 | 0.100| 1 | %    | 02/26/09       | 02/26/09       | SM 2540 B   |

<table>
<thead>
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<th>Result</th>
<th>RL</th>
<th>DF</th>
<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
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<td>%</td>
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| ABM-CS-12-04 | 09-02-1922-15 | 02/20/09 | Solid | Solids, Total | 58.2 | 0.100| 1 | %    | 02/26/09       | 02/26/09       | SM 2540 B   |

<table>
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<th>DF</th>
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Project: Alamitos Bay Marina Basin

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<th>Qual</th>
<th>Units</th>
<th>Date Prepared</th>
<th>Date Analyzed</th>
<th>Method</th>
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RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers
Quality Control - Spike/Spike Duplicate

Aquatic Bioassay & Consulting Laboratories  
29 North Olive Street  
Ventura, CA 93001-2552

Date Received: 02/20/09  
Work Order No: 09-02-1922  
Preparation: 02/20/09  
Method: EPA 7471A Total  

EPA 7471A Total

Project  Alamitos Bay Marina Basin

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<th>Quality Control Sample ID</th>
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<th>Date Analyzed</th>
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RPD - Relative Percent Difference  
CL - Control Limit
## Quality Control - Spike/Spike Duplicate

**Aquatic Bioassay & Consulting Laboratories**  
29 North Olive Street  
Ventura, CA 93001-2552

**Work Order No:** 09-02-1922  
**Preparation:** EPA 7470A Total  
**Method:** EPA 7470A

**Project:** Alamitos Bay Marina Basin

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<th>MS/MSD Batch Number</th>
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<th>%REC CL</th>
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**RPD - Relative Percent Difference**  
**CL - Control Limit**
Project: Alamitos Bay Marina Basin

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RPD - Relative Percent Difference, CL - Control Limit
Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories
29 North Olive Street
Ventura, CA 93001-2552

Date Received: N/A
Work Order No: 09-02-1922
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: Alamitos Bay Marina Basin

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<th>Quality Control Sample ID</th>
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<th>Date Prepared</th>
<th>Date Analyzed</th>
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<td>97</td>
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RPD - Relative Percent Difference, CL - Control Limit
## Quality Control - LCS/LCS Duplicate

Aquatic Bioassay & Consulting Laboratories  
29 North Olive Street  
Ventura, CA 93001-2552

Date Received: N/A  
Work Order No: 09-02-1922  
Preparation: EPA 7470A Total  
Method: EPA 7470A

### Project: Alamitos Bay Marina Basin

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<th>Quality Control Sample ID</th>
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RPD - Relative Percent Difference, CL - Control Limit
## Glossary of Terms and Qualifiers

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<th>Qualifier</th>
<th>Definition</th>
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<tr>
<td>*</td>
<td>See applicable analysis comment.</td>
</tr>
<tr>
<td>1</td>
<td>Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>2</td>
<td>Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>3</td>
<td>Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>4</td>
<td>The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.</td>
</tr>
<tr>
<td>5</td>
<td>The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.</td>
</tr>
<tr>
<td>A</td>
<td>Result is the average of all dilutions, as defined by the method.</td>
</tr>
<tr>
<td>B</td>
<td>Analyte was present in the associated method blank.</td>
</tr>
<tr>
<td>C</td>
<td>Analyte presence was not confirmed on primary column.</td>
</tr>
<tr>
<td>E</td>
<td>Concentration exceeds the calibration range.</td>
</tr>
<tr>
<td>H</td>
<td>Sample received and/or analyzed past the recommended holding time.</td>
</tr>
<tr>
<td>J</td>
<td>Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.</td>
</tr>
<tr>
<td>ME</td>
<td>LCS Recovery Percentage is within LCS ME Control Limit range.</td>
</tr>
<tr>
<td>N</td>
<td>Nontarget Analyte.</td>
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<tr>
<td>ND</td>
<td>Parameter not detected at the indicated reporting limit.</td>
</tr>
<tr>
<td>Q</td>
<td>Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.</td>
</tr>
<tr>
<td>U</td>
<td>Undetected at the laboratory method detection limit.</td>
</tr>
<tr>
<td>X</td>
<td>% Recovery and/or RPD out-of-range.</td>
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<tr>
<td>Z</td>
<td>Analyte presence was not confirmed by second column or GC/MS analysis.</td>
</tr>
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<td>SAMPLE ID</td>
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REQUESTED ANALYSES:

- TPH (g)
- TPH (g) or (Cr-Cr) or (Cr-Cr)
- BTEX / MBF (8268) or (Cr-Cr)
- VOCs (8670)
- Oxygenates (8268)
- E nzyme Prep (8035)
- SVOCs (8270)
- Pesticides (8061A)
- PCBs (8662)
- PAHs (8610) or (8270)
- T2 Metals (8610, 8790 or 218, 6)
- COV (8610 or 8790 or 218, 3)
- VOCs (8670 or 8790 or 218, 3)
- TPH (g) or (Cr-Cr)
- Mercury (7471A)

SPECIAL INSTRUCTIONS:

- Fquis dadd

DISTRIBUTION: White with final report, Green and Yellow to Client.
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05/01/07 Revision
## LABORATORY CLIENT:

**ABC Laboratories**

**Address:** 90 N Olive Street  
**City:** Ventura, CA  
**Zip:** 93001  
**Tel:** (805) 643-5621  
**E-mail:** Scott@aquabio.org

## CLIENT PROJECT NAME / NUMBER:

**Alamitos Bay Marina Basin**

## PROJECT CONTACT:

**Scott Johnson**

## Turnaround Time:

- **SAME DAY**  
- **24 HR**  
- **48 HR**  
- **72 HR**  
- **STANDARD**

## SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY):

- RWQCB REPORTING FORMS
- COELT EDF

## SPECIAL INSTRUCTIONS:

- Equis & Edie

### LAB USE ONLY

<table>
<thead>
<tr>
<th>SAMPLE ID</th>
<th>FIELD POINT</th>
<th>SAMPLING</th>
<th>MATRIX</th>
<th>NO. OF CONT.</th>
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**Date:** 2.20.09  
**Time:** 13:43

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Released by:** (Signature)

**Received by:** (Signature/Affiliation)

**Received by:** (Signature/Affiliation)

**Received by:** (Signature/Affiliation)

**Received by:** (Signature/Affiliation)

**Received by:** (Signature/Affiliation)

**Received by:** (Signature/Affiliation)
**LABORATORY CLIENT:** ABC Laboratories  
**ADDRESS:** 29 N. Olive Street  
**CITY:** Ventura  
**STATE:** CA  
**ZIP:** 93001  
**TELEPHONE:** (805) 641-5621

**CLIENT PROJECT NAME / NUMBER:** Alamitos Bay Marsh Basin  
**PROJECT CONTACT:** Scott Johnson  
**SAMPLER(S): (PRINT):** Jim Mann  
**LAB USE ONLY:** 02-22

### REQUESTED ANALYSES

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<td>10-20</td>
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**RECEIVED BY:** (Signature)  
**DATE:** 1-20-09  
**TIME:** 2:00 PM

**RECEIVED BY:** (Signature)  
**DATE:** 1-20-09  
**TIME:** 1:13 PM

**RECEIVED BY:** (Signature)  
**DATE:** 1-20-09  
**TIME:**

**RECEIVED BY:** (Signature)  
**DATE:** 1-20-09  
**TIME:**

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05/01/07 Revision
WORK ORDER #: 09-02-_____

SAMPLE RECIPIENT FORM

CLIENT: ABC Labs

DATE: 02/20/09

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature $\frac{2.5}{0.2}$ °C = 3 °C

☐ Blank  ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by:______).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air  ☐ Filter  ☐ Metals Only  ☐ PCBs Only

Initial: DL

CUSTODY SEALS INTACT:

☐ Cooler  ☐ ____________  ☐ No (Not Intact)  ☑ Not Present  ☐ N/A

Initial: DL

☐ Sample  ☐ ____________  ☐ No (Not Intact)  ☑ Not Present

Initial: WSC

SAMPLE CONDITION:

Yes  No  N/A

Chain-Of-Custody (COC) document(s) received with samples........... ☐  ☐  ☐

COC document(s) received complete........................................... ☐  ☑  ☐

Sampler's name indicated on COC................................................... ☐  ☐  ☐

Sample container label(s) consistent with COC.............................. ☐  ☐  ☐

Sample container(s) intact and good condition.............................. ☐  ☐  ☐

Correct containers and volume for analyses requested................... ☑  ☐  ☐

Analyses received within holding time...................................... ☑  ☐  ☐

Proper preservation noted on COC or sample container.................... ☑  ☐  ☐

Volatile analysis container(s) free of headspace............................ ☐  ☐  ☐

Tedlar bag(s) free of condensation............................................ ☐  ☐  ☑

CONTAINER TYPE:

Solid: ☑ 4ozCGJ  ☐ 8ozCGJ  ☐ 16ozCGJ  ☐ Sleeve  ☐ EnCores®  ☐ TerraCores®  ☐

Water: ☐ VOA  ☐ VOAh  ☐ VOAna₂  ☐ 125AGB  ☐ 125AGBh  ☐ 125AGBpo₄  ☐ 1AGB  ☐ 1AGBna₂

☐ 1AGBs  ☐ 500AGB  ☐ 500AGBs  ☐ 250CGB  ☐ 250CGBs  ☐ 1PB  ☐ 500PB  ☐ 500PBna  ☐ 250PB

☐ 250PBn  ☐ 125PB  ☐ 125PBznna  ☐ 100PBsterile  ☐ 100PBna₂  ☐ ____________

Air: ☐ Tedlar®  ☐ Summa®  ☐

Checked/Labeled by: NSC

Reviewed by: NL

Scanned by: WSC

Container: Clear  Amber  Poly/Plastic  Glass  Jar  Bottle

Preservative: HCl  HNO₃  Na₂SO₃  NaOH  PO₄  H₂PO₄  s₂O₂  znna:ZnAc₂+NaOH

SOP T100_090 (12/10/08)
SAMPLE ANOMALY FORM

CHAIN OF CUSTODY (COC):

☐ Not relinquished by client – no signature
☐ No date/time relinquished
☐ COC not received with samples – notify PM
☐ Incomplete information regarding samples, tests, etc.

Comments:

(+8) +(+9) no analyses requested

SAMPLES - CONTAINERS & LABELS:

☐ Samples NOT RECEIVED but listed on COC
☐ Samples received but NOT LISTED on COC
☐ Holding time expired – list sample ID(s) and test
☐ Insufficient quantities for analysis – list test
☐ Improper container(s) used – list test
☐ No preservative noted on COC or label – list test & notify lab
☐ Sample labels illegible – note test/container type
☐ Sample labels do not match COC – Note in comments
  ☐ Sample ID
  ☐ Date and/or Time Collected
  ☐ Project Information
  ☐ # of containers
  ☐ Sample containers compromised – Note in comments
    ☐ Leaking
    ☐ Broken
    ☐ Without Labels
  ☐ Other:

Comments:

HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of Vials Received</th>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of Vials Received</th>
<th>Sample #</th>
<th>Container ID(s)</th>
<th># of RSK or CO₂ or DO or Organic Lead Received</th>
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Comments:

Initial / Date J.L.C. 2-20-09

SOP T100_081 (09/19/08)
BEST MANAGEMENT PRACTICES
BEST MANAGEMENT PRACTICES

Best Management Practices (BMP) are the actual practices—including the forms, procedures, charts, software references, etc.—actually used by dredgers to minimize consequences of dredging and disposal on water quality. Common BMPs include Silt Curtains, Gunderbooms, and Operational Controls.

SILT CURTAINS

Silt curtains are intended to allow suspended sediment at a dredging site to settle out of the water column in a controlled area, minimizing the area that is affected by the increased suspended sediment usually present at a dredging site. A silt curtain is an impermeable barrier. They are constructed of a flexible reinforced thermoplastic material. The upper hem has floatation material and the lower hem has ballast material. Silt curtains are most effective when used on a project where they are not opened and closed to allow equipment access to the dredging or disposal area. Silt curtains are also limited to project locations with less than 1-2 knot currents.

GUNDERBOOMS

Gunderbooms are designed to allow water to flow through the curtain while filtering suspended dredged sediment from the flow. Gunderbooms are similar to silt curtains but are constructed of permeable geotextile fabrics. They are also designed to extend from the water surface to the project bottom.

MECHANICAL DREDGE OPERATIONAL CONTROLS

There are three fundamental controls possible with mechanical dredges.

- **Increase cycle time.** Longer cycle time reduces the velocity of the ascending loaded bucket through the water column, which reduces potential to wash sediment form the bucket. However, limiting the velocity of the descending bucket reduces the volume of sediment that is picked up and requires more total bites to remove the project material. The majority of the sediment resuspension, for a clamshell dredge, occurs when the bucket hits the bottom.

- **Eliminate multiple bites.** When the clamshell bucket hits the bottom, an impact wave of suspended sediment travels along the bottom away from the dredge bucket. When the clamshell bucket takes multiple bites, the bucket loses sediment as it is reopened for subsequent bites. Sediment is also released higher in the water column, as the bucket is raised, opened, and lowered.
· **Eliminate bottom stockpiling.** Bottom stockpiling of the dredged sediment in silty sediment has a similar effect as multiple bite dredging; an increased volume of sediment is released into the water column from the operation.

**HYDRAULIC DREDGE OPERATIONAL CONTROLS**

There are three fundamental controls possible with hydraulic dredges.

· **Reduce cutterhead rotation speed.** Reducing cutterhead rotation speed reduces the potential for side casting the excavated sediment away from the suction entrance and resuspending sediment. This measure is typically effective only on maintenance or relatively loose, fine grain sediment.

· **Reduce swing speed.** Reducing the swing speed ensures that the dredge head does not move through the cut faster than it can hydraulically pump the sediment. Reducing swing speed reduces the volume of resuspended sediment. The goal is to swing the dredge head at a speed that allows as much of the disturbed sediment as possible to be removed with the hydraulic flow. Typical swing speeds are 5-30 feet/minute.

· **Eliminate bank undercutting.** Dredgers should remove the sediment in maximum lifts equal to 80% or less of the cutterhead diameter.

**HOPPER DREDGES AND BARGES OPERATIONAL CONTROLS**

There are three controls possible with dredges and barges.

· **Eliminate or reduce hopper overflow.** Eliminating or reducing hopper overflow reduces the volume of fine material which flows from the hopper in the overflow. One caution is that this control may significantly reduce project production for hopper dredges or when hydraulic dredging into a barge.

· **Lower hopper fill level.** Lowering the hopper fill level in rough sea conditions can prevent material loss during transport.

· **Recirculation system.** Water from the hopper overflow can be recirculated to the draghead and is used to transport more material into the hopper.

**SPECIALTY EQUIPMENT**

· **Pneuma Pump.** The Pneuma pump is used primarily for removal of fine-grained sediment. The Pneuma pump offers high solids concentration (up to 90%) in the dredge slurry, with minimal turbidity.