# ORMOND BEACH GENERATING STATION

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM

# SAMPLING QUALITY ASSURANCE PROCEDURES MANUAL

August 2009

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# RRI ENERGY

# ORMOND BEACH GENERATING STATION

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**NPDES Sampling Quality Assurance Procedures Manual**

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**NPDES Sampling Procedures Manual Signoff and Approval**

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| Michael J. Mancuso | Author | Developed | 08/31/09 | |
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# TABLE OF CONTENTS

**FIGURES**



**TABLES**



**APPENDICES**

Appendix A -6. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for annual Low Volume Waste sampling (May) subcontracted to Calscience Environmental Laboratories.

Appendix A -7. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for stormwater sampling subcontracted to CAPCO Analytical Services.

# CHAPTER 1

# ORMOND BEACH QUALITY ASSURANCE PROCEDURES OVERVIEW

## SECTION 1 NPDES PERMIT OVERVIEW

### 1.1.0 Introduction

RRI Energy discharges waste water from the Ormond Beach Generating Station under the waste discharge requirements stipulated in the National Pollutant Discharge Elimination System (NPDES) Monitoring and Reporting Program No. CI-5619 (Permit Number CA0001198) issued by the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) on 28 June 2001.

### 1.1.1 Station Description

The Ormond Beach Generating Station is located on the California coast, approximately 2.3 miles (mi) (3.7 kilometers (km)) southeast of the entrance to Port Hueneme in Ventura County. The generating station consists of two steam-electric, gas fueled generating units, each rated at 750 megawatts (Mw). At full load, each unit produces 5.7 million pounds (lbs) (2.6 million kilograms (kg)) of steam per hour which is supplied to two tandem compound turbines at a temperature of 555.6 °C.

Cooling water is supplied to the station through a 13.1 feet (ft) (4.0-meter (m)) inside-diameter (ID) concrete conduit at a maximum flow rate of about 475,000 gallons per minute (gpm). The intake structure (Discharge Serial No. 002) is located 2098 ft (640 m) offshore at a water depth of about 32.8 ft (10 m) Mean Low Lower Water (MLLW); the port is 6.6 ft (2 m) above the bottom and is covered by a raised velocity cap. Seawater enters the conduit at a velocity of about 2.7 feet per second (ft/sec) (82 centimeters per second (cm/s)) and passes through a screening facility in the plant to remove marine life, trash, and other debris.

After passing through the screenwell, cooling water is pumped to two condensers (one per unit), where the temperature is elevated approximately 16.7 °C when the plant is operating at full capacity. The heated effluent is returned to the ocean through a 14.1 ft (4.3-m)-ID conduit which terminates 1500 ft (457 m) offshore at a bottom depth of 29.5 ft (9 m) (MLLW). The discharge water is directed vertically upward and exits the outfall coffer (Discharge Serial No. 001) at a depth of 19.7 ft (6 m) (MLLW) at a speed of about 2.8 ft/sec (87 cm/s).

Approximately 20,000 gpm of the main flow is diverted to three auxiliary heat exchangers which cool treated de-ionized water used in auxiliary station equipment. The temperature of this seawater is elevated approximately 5.6°C before it joins the main cooling-water flow in the discharge conduit.

Ormond discharges up to 688.2 million gallons per day (mgd) of waste water consisting of once through cooling water from the two steam-electric generating units (four condenser halves), metal cleaning waste (wastewaters resulting from chemical cleaning of any metal process equipment including, but not limited to, boiler tube, boiler fireside, and air preheaters), and low volume wastes (softener regeneration wastes, fireside and preheater washes, and floor drains) into the Pacific Ocean at Ormond Beach, a water way of the United States. The wastes are directed vertically upward from an outfall coffer (Discharge Serial No. 001) at a depth of 19.7 ft (6 m) (MLLW) (Latitude: 34$^o$ 07' 26", Longitude: 119$^o$ 10' 24").

### 1.1.2 NPDES Permit Sections

The NPDES permit contains the following sections:

- Reporting Requirements
- Effluent Monitoring Requirements
- Effluent Monitoring Program
- Effluent Monitoring Program for In-Plant Waste Streams
- Receiving Water Monitoring
- Storm Water Monitoring and Reporting

### 1.1.3 Quality Assurance Manual Description

This Quality Assurance (QA) Manual will provide standard procedures for the various elements of the NPDES permit. The manual is divided into three chapters to facilitate use by station personnel.

Chapter 1 addresses the NPDES Permit and Quality Assurance Manual including:

- NPDES Permit Overview
- NPDES Permit Sections
- Quality Assurance Manual Description

Chapter 2 will address the In-Plant Monitoring including:

- Responsibilities and Accountabilities
- Regulatory Monitoring and Report Writing
- Surface Monitoring Point Locations and Descriptions
- Sampling Preparation and Recordkeeping
- Sample Collection, Analysis, Preservation, and Disposition Procedures
    - Effluent Monitoring
    - In-Plant Waste Streams
    - Storm Water Monitoring
- Quality Assurance Procedures

Chapter 3 will address the Receiving Water Monitoring including:

- Water Column Monitoring
- Sediment Characteristics
- Mussel Bioaccumulation
- Benthic Infauna
- Fish Impingement

# CHAPTER 2

# IN-PLANT MONITORING

## SECTION 2.1 IN-PLANT MONITORING OVERVIEW

### 2.1.0 Introduction

The collection, analysis, and reporting of in-plant surface water samples are a system-wide effort required by regulatory environmental permits and other RRI Energy, Inc. commitments. Decisions based on the analysis of these surface water samples are dependent on the proper collection of these samples. One of the greatest initial potential sources of inaccurate analytical results is due to sampling techniques and practices utilized by the sampling technician in the field. Sample handling, preservation, storage, and shipment of the samples are other potential sources of inaccurate analytical results. This chapter of the manual will provide guidelines for the consistent Standard Operating Procedures (SOPs) for the collection of samples for the National Pollution Discharge Elimination System (NPDES) and other regulated sampling requirements for the RRI Energy Ormond Beach Generating Station. The chapter will provide standard procedures for:

- Sample Collection (representative sampling)
- Sample Preservation
- Sample Deposition
- Documentation (accurate recordkeeping)
- Proper Analysis (Environmental Protection Agency approved protocols)
- Quality Assurance / Quality Control (QA/QC)

The SOPs presented in this chapter of the manual are intended for the use by personnel involved with the collection, on-site analysis, submittal of samples to contract laboratories for analysis, and reporting of analytical results for the RRI Energy Ormond Beach Generating Station. This manual is part of RRI Energy's overall Environmental Quality Assurance Program.

Station personnel or contracted laboratories are responsible for the collection, analyses, and reporting of the data for the In-Plant Monitoring. This section will outline the responsibilities and accountabilities of the station personnel, regional support staff, and contract laboratories.

### 2.1.1 Responsibilities and Accountabilities

The responsibility for the sample collection, analysis, and reporting of the data generated is shared between station personnel, regional support staff, and contracted laboratories. A flow diagram of the flow of information between the responsible individuals is presented in Figure 2.1.1.

2.1.1.1 Station Manager

The Station Manager for the Ormond Beach Generating Station is responsible for:

- Operating the station in compliance with environmental regulations, commitments, and policies.
- Ensure all station personnel are in compliance with this manual.
- Ensure all labs follow approved EPA protocols for sample collection, preservation, handling, storage shipping and analysis.
- Ensure all assigned station personnel meet all QA/QC requirements, participate in the annual DMR QA-QC studies and if desired, perform routine proficiency testing.

2.1.1.1 Environmental Safety and Health (ESIH) Local Process Owner (LPO)

The ESIH LPO for the Ormond Beach Generating station is responsible for:

- Ensuring that all EPA protocols and techniques for sample collection, preservation, handling, storage, shipping and analysis are followed.
- Reviewing qualifications and services provided by of all NPDES laboratories, including Ormond Beach Generating Station Laboratory.
- Approving EPA protocols and techniques for sample collection, preservation, handling, storage, shipping and analysis as applicable for the on-station NPDES lab.
- Assisting station personnel during audits of QA programs to assure compliance with regulatory requirements and RRI Energy and station policies.
- Submitting required data, obtaining and maintaining permits, and interface with all regulatory agencies.
- Coordinating with the various laboratories used and prepare and submit all NPDES reports in a timely manner.

- Interfacing with all environmental regulatory agencies to ensure their requests are properly addressed.

- Maintaining all required records as specified in the Station Records Retention Procedure.

- Coordinating with all laboratories to identify and investigate suspect samples results.

- Providing technical support as needed and ensuring necessary station follow-up is completed.

- Assisting to identify and investigate all suspect samples results.

2.1.1.2 Lab Director

The Lab Director for the Ormond Beach Generating station is responsible for:

- Reviewing, commenting and approving all NPDES water quality control QA/QC standards.
- Ensuring that environmental water samples are collected, analyzed on-site for specific parameters, and/or properly transferred to contract laboratories for analysis.
- Supervising station personnel during audits of QA programs to assure compliance with regulatory requirements and RRI Energy and station policies.

- Assisting to identify and investigate all suspect samples results.

- Providing technical support as needed and ensuring necessary station follow-up is completed.

- Ensuring all test results from the station NPDES lab are timely reported to the ESIH office.

2.1.1.3 Chemical Technician

The Chemical Technician for the Ormond Beach Generating Station is responsible for:

- Training designated station personnel in sample collection, on-site analysis and reporting water data.

- Identifying and investigate all suspect samples results and report to the Lab Director and ESIH LPO.

- Ensuring that all EPA protocols and techniques for sample collection, preservation, handling, storage, shipping and analysis are followed.

- Providing technical support as needed and ensuring necessary station follow-up is completed.

- Timely reporting test results to the ESIH Office.

- Performing trend analysis, if necessary, using historical analytical results.

2.1.1.3 Contract Analytical Laboratories

Outside laboratories, such as MBC Applied Environmental Sciences (MBC), Calscience Environmental Laboratories (CEL), CAPCO, and Proteus Sea Farms provide analytical services to Ormond Beach Generating Station and participate in audit programs to ensure the quality and validity of the analytical results. The responsibilities of the laboratories may include:

- Providing the appropriate sample containers (labeled or unlabeled) with the required preservative for specific analytical parameters.

- Providing approved NPDES / EPA protocols and analysis techniques

- Providing Chain-of-Custody forms

- Performing NPDES / EPA approved sample analysis and reporting results to the station in a timely manner. Expeditious reporting of the results is required, along with expeditious review of the results by station personnel

- Retaining analytical results and other records as required by regulation to be maintained for data generated by the outside laboratory

- Immediate notification of suspect samples, or analytical results, or if results exceed the monthly average permit limits

- Participating in the annual DMR QA studies

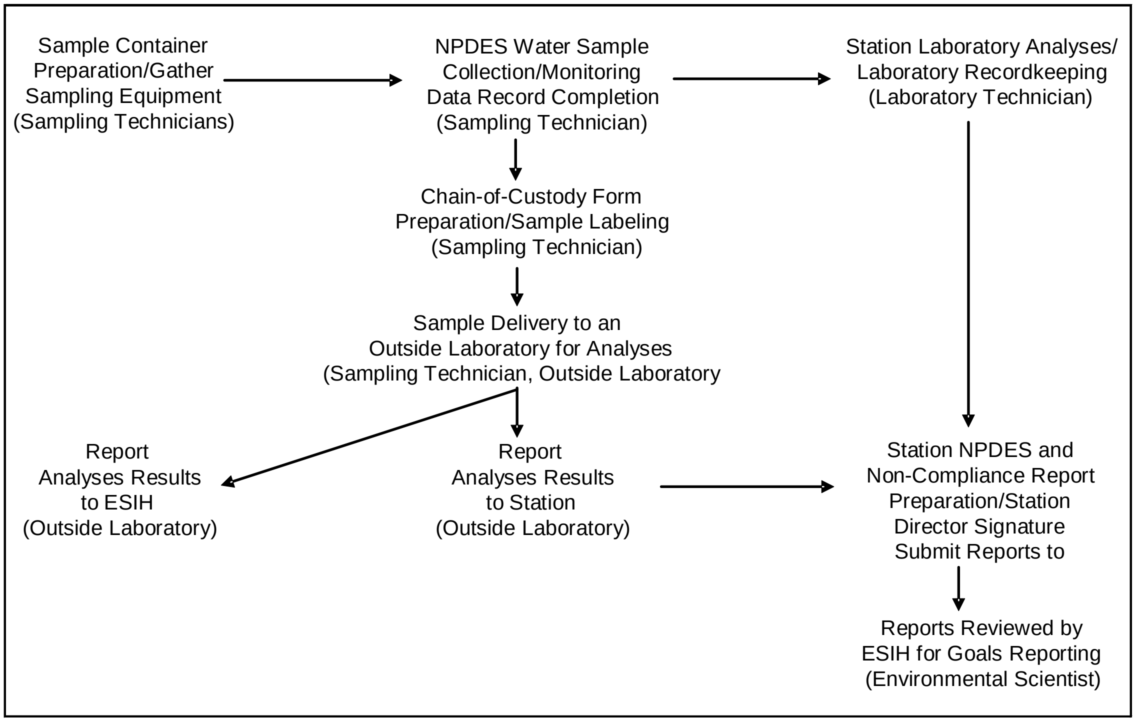


**Figure 2.1.1. Information flow chart.**

## SECTION 2.2 REGULATORY MONITORING AND REPORT WRITING

### 2.2.0 Regulatory Monitoring

Station sampling point(s) have been established for the point of discharge and are located where representative samples of that effluent can be obtained. Provisions have been made to enable visual inspection before discharge. If an oil sheen, debris, and/or other objectionable materials or odors are present, the discharge shall not be commenced until compliance with the requirements has been demonstrated. All visual observations shall be included in the monitoring report. The LARWQCB shall be notified in writing of any change in the sampling points, or in the methods for determining the quantities of pollutants in the individual waste streams.

Pollutants are analyzed using methods described in 40CFR 136.3, 136.4, and 136.5; or where no methods are specified for a given pollutant, methods have been approved by the LARWQCB or the State Board. Laboratories analyzing monitoring samples must be certified by the Department of Public Health through the Environmental Laboratory Accreditation Program (ELAP). A copy of the laboratory certification is submitted with the annual report.

Water/wastewater samples must be analyzed within the allowable holding time limits as specified in 40CFR 136.3 and are presented in Table 2.5.2. All QA/QC samples must be run on the same dates as the samples were actually analyzed, and the results must be reported in the Regional Board format (if available).

### 2.2.1 NPDES Monitoring Reports

Monitoring data required by NPDES Permit Number CA0001198 is submitted to the California Regional Water Quality Control Board (LARWQCB) Los Angeles Region.

Specific monitoring data is submitted on a monthly, quarterly, semiannual, and annual basis as required by the permit. The frequency and schedule for submittal is as follows.

Daily Cl sampling and testing is performed on days of chlorination when the station is discharging water. The chlorination system is on only on days that the station chemical technician is not on station. Monitoring data must be received by the LARWCQB by the first day of the second month following each sampling period.

Weekly pH sampling and testing is performed when the station is discharging water. Monitoring data must be received by the LARWCQB by the first day of the second month following each sampling period.

Monthly sampling is performed when the station discharges water at anytime during a given month. Monitoring data must be received by the LARWQCB by the first day of the second month following each monthly sampling period.

Quarterly sampling is performed during the months of February, May, August, and November. Monitoring data must be received by the LARWQCB by the first day of the second month following each quarterly sampling period. Any mitigation or remedial activity including pre-discharge treatment conducted at the site to bring the discharge into full compliance must be reported in the quarterly monitoring report.

Semiannual sampling is performed during the months of May and November. Monitoring data must be received by the LARWQCB by the first day of the second month following each semiannual sampling period.

Annual sampling is performed during the month of May. Monitoring data must be received by the LARWQCB by the first day of the second month following each annual sampling period.

Should there be instances when monitoring could not be completed during these specified months, the LARWQCB must be notified and the reason stated to obtain an alternate schedule.

An annual summary report shall be submitted to the LARWQCB by March 1 of each year. The report shall contain a discussion, tabular, and graphical summaries of the data obtained during the previous calendar year. The annual summary shall include a discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements. The data shall be submitted to the LARWQCB on hard copy and on a 3 ½ inch computer diskette. The electronic data must be in an IBM compatible format, preferably in Microsoft Excel format.

For every item where the permit requirements are not met, station personnel shall submit a statement of the cause(s), and actions taken or proposed which will bring the discharge into full compliance at the earliest possible time, including a timetable for implementing these actions.

All monitoring and annual summary reports must be addressed to the LARWQCB, Attention: Information Technology Unit. The reports must be referenced to Compliance File Number CI-5619 to facilitate routing to the appropriate staff and file.

Each monitoring report must affirm in writing that "All analyses were conducted at a laboratory certified for such analyses by the State of California Department of Public Health, and in accordance with current USEPA guideline procedures or as specified in the Monitoring Program".

Each report shall contain the following completed declaration:

"I declare under penalty of law that I have personally examined, and am familiar with, the information submitted in this document and all attachments, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment. [CWC Sections 13263, 13267, and 13268]".

Executed on the _____ day of __________ at _______________.

_____________________ (Signature)

_____________________ (Title)

The LARWQCB is developing a compliance monitoring database management system that may require submittal of the monitoring and annual reports electronically when it becomes fully operational.

### 2.2.2 Flow Measurements

Flow measurements are entered in the appropriate column for flow and in the proper date row (date of sampling). Decimals are required for data representative of conduit flow in million gallons per day (mgd) and flow rates in gallons per day (gpd) are reported as whole numbers. If one flow estimate or measurement is indicated and only one was obtained, that reading is reported as both the “Average” and “Maximum”. If two or more readings are required/obtained, or a continuous flow recorder is in operation, the arithmetic average of those readings is reported as the “Average” and the highest reading is reported in the “Maximum” column. The frequency of flow readings and sample type is noted on the reporting form column headings. If no discharge occurred during any given reporting period, “NODI (9)” must be entered under flow column.

The Daily Maximum flow limit for Ormond’s outfalls is 688.2 mgd.

### 2.2.3 Sample Measurements

The results of sample analyses are always entered in the appropriate column for each parameter and in the proper date row (date of sampling). The appropriate units are supplied on the FORM. Before transcribing the results onto the FORM or calculating averages, the analytical results from outside laboratories must be converted to the same units if necessary. If a parameter was undetected in a given reporting period, “ND” must be entered under the parameter in the day of the sampling and noted in the remarks column as “Not-Detected”.

### 2.2.4 Non-Compliance Notifications

Ormond must comply with all applicable effluent limitations, national standards of performance toxic effluent standards, and all federal regulations established pursuant to Sections 301, 302, 303(d), 304, 306, 307, 316, and 423 of the Federal Clean Water Act and amendments thereto.

In the determination of compliance with the monthly average limitations, the following provisions shall apply to all constituents:

2.2.4.1 If the analytical result of a single sample monitored monthly or at a lesser frequency, does not exceed the monthly average limit for that constituent, Ormond will have demonstrated compliance with the monthly average limit for that month.

2.2.4.2 If the analytical result of a single sample monitored monthly or at a lesser frequency, exceeds the monthly average limit for that constituent, Ormond shall collect three (3) additional samples at approximately equal intervals during the month. All four (4) analytical results shall be reported in the monitoring report for that month, or 45 days after the sample was obtained, whichever is later.

If the numerical average of the analytical result of these four samples does not exceed the monthly average limit for that constituent, compliance with the monthly average limit has been demonstrated for that month. Otherwise, the monthly average limit has been violated.

2.2.4.3 If item 2.2.4.2 has not been implemented and the result of one sample (item 2.2.4.1) exceeds the monthly average limit, then Ormond is in violation of the monthly average limit.

2.2.4.4 In the event of noncompliance with a monthly average effluent limitation, the sampling frequency for that constituent shall be increased to weekly and shall continue at this level until compliance with the monthly average effluent limitation has been demonstrated.

### 2.2.5 Investigation of Suspect Samples

Station personnel should make certain that all samples collected are taken from the proper locations, with the proper techniques, utilizing the appropriate equipment, and at the frequencies specified in the NPDES permit. This ensures the number of suspect samples is minimized.

A suspect sample is a sample that is inconsistent with previous samples taken at a specific location and that may not be representative of the actual discharge. Suspect samples can occur during:

- Severe weather (e.g. high winds, torrential rain) that may contaminate the sample
- Improper sampling
- Improper analysis
- Shipping damage/delays

All samples should be verified by station personnel before shipping to exclude any suspect samples prior to analysis.

Abnormal sample results should be investigated as suspect. Suspect samples can be identified by the laboratory or station personnel. Station personnel must contact the laboratory if any suspect results are identified. Laboratory personnel must review the analysis of that sample and the laboratory reporting of the sample's data to ensure accuracy. If the analysis and reporting is confirmed, the laboratory must reanalyze the original extraction of the sample, and then reanalyze the original sample (if there is adequate sample remaining). Results can be considered accurate if they pass all three QA checks. Resampling may be recommended if time permits.

### 2.2.6 Invalidating Samples

Sample results that have been found to be in error and not representative of the water quality in the discharge must be invalidated. The results must be reported to the LARWQCB accompanied by a letter detailing the reasons the results should be invalidated. A sample should be invalidated if it was:

- Collected under abnormal circumstances – these include unusual site conditions and severe weather which may have contaminated the sample
- Collected using improper sampling techniques – use of improper sampling equipment, improper sample types, or incorrect preservation
- Collected at improper sample locations
- Analyzed beyond approved hold times
- Damaged during storage or shipment to the laboratory
- Analyzed by improper laboratory methods

Samples should not be invalidated when samples are:

- Collected under normal weather conditions – including normal rain
- Higher or lower values than normal results

Every precaution should be taken during sampling, collection, preservation, and shipping to assure that samples are not invalidated except under extreme conditions.

Samples shipped to the laboratory but subsequently were determined to be invalid should be invalidated by having station personnel contact the laboratory and explain the reasons for invalidating the sample. Resampling should occur if time permits. The general manager is ultimately responsible for making the decision to invalidate a sample and the reason should be logged in the Environmental Coordinator’s daily log book and initialed by the manager.

If a sample is found to be invalid after being submitted to LARWQCB, station personnel must contact ESIH and they must contact the RWQCB that receives the stations monitoring reports. Resampling should occur if time permits and an amended monitoring report should be completed and resubmitted. The Environmental Coordinator will coordinate an investigation of the suspect samples between the station and the laboratory and will maintain on file the reason for invalidating a sample.

### 2.2.7 Reporting Extra Samples

Often extra sampling is performed in addition to the minimum sample requirements of the NPDES permit. When this has occurred, questions have been raised regarding the need to report the data obtained from these extra samples.

If the station monitors any pollutant using analytical methods contained in 40 CFR Part 136 or alternate test procedures approved pursuant to those parts, unless other test procedures have been specified in the permit, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the monitoring reporting form.

### 2.2.8 Grab Samples vs. Continuous Recorders

If continuous recorders at the outfalls or in-plant waste streams are in place to monitor a water quality parameter (e.g. flow). These monitors record data at set time intervals over a 24-hour period. Often the permit requires only grab samples to be taken at some of these locations. In this situation, station personnel should report the lowest recorded value for the time period as the instantaneous minimum and the highest recorded value for the time period as the instantaneous maximum. Daily minimums/maximums would also be the lowest and the highest recorded for the 24-hour time period. If the permit requires a certain number of grab samples per time period, these can be read off the continuous record. These individual data points should be equally spaced from one another to be the most representative of prevailing conditions at that discharge point.

### 2.2.9 Reporting Significant Numbers

When reporting analytical data on reporting form, all numbers must be reported with the proper number of significant figures. Extra decimal places not present on the NPDES permit should be eliminated from the report. Note, however, that whole numbers as given in the following example do not follow exactly the mathematical rules for determining significant figures. Whole numbers are interpreted as having a decimal point even though one may not be shown. For example: An oil and grease sample has a value of 14.9 mg/l. The permit has a daily maximum of 20 mg/l. The number of significant figures in the permit is two so the value reported should only have two figures. Thus, the 14.9 mg/l would be rounded to 15 mg/l. if the permit had a daily maximum of 20.0 mg/l the significant figures are now three and the value of 14.9 mg/l would be written on the reporting form. The amount of significant figures expressed in the NPDES permit should be used on the reporting form in circumstances where the permit and the reporting form vary in the number of significant figures.

Numbers converted to scientific notation have only the number of significant figures that are to the left of the decimal point if the decimal point is not specified. For example: 1,400,000,000 converts to $1.4 \times 10^9$ (two significant figures) while 1,400,000,000.0 converts to $1.40 \times 10^9$ (three significant figures). When reporting values in significant figures, report only the number of significant figures required. For example: if the limit is $7 \times 10^8$ BTU/day (one significant figure) and you have a value of $7.1 \times 10^8$ BTU/day, $7 \times 10^8$ BTU/day should be reported.

Rounding should be performed consistent with guidance provided by the most recent version of *Standard Methods for the Examination of Water and Wastewater*. Rounding should be performed by dropping digits that are not significant. If the digit 6, 7, 8, or 9 is dropped, the preceding digit should be increased by one unit. If the digit 0, 1, 2, 3, or 4 is dropped the preceding digit should not be altered. If the digit 5 is dropped, the preceding digit should be rounded off to the nearest even number; thus, 2.25 becomes 2.2 and 2.35 becomes 2.4.

## SECTION 2.3 SURFACE WATER MONITORING POINT LOCATIONS AND DESCRIPTIONS

### 2.3.0 Outfalls

Ormond Beach Generating Station has two outfalls permitted under NPDES Permit Number CA0001198 that require sampling when discharging. NPDES outfall numbers and descriptions are listed below.

| Outfall Number | Description |
|---|---|
| 001 | Condenser cooling water |
| 002 | Intake water for condenser cooling water, Discharge during tunnel reversal for heat treatments |

Monitoring requirements for each outfall are listed in Table 2.3.1. Specific sample collection points for the outfalls are presented in Figures 2.5.1 to 2.5.3.

### 2.3.1 Contributing Flows

| Operation | Flow (mgd) | Description |
|---|---|---|
| Once-through cooling water | 688.2 | Ocean Discharge |
| Mariculture Laboratory | 0.29 | Ocean Discharge |
| Condensate overboard | Negligible | Ocean Discharge |
| Auxiliary boiler blowdown | Negligible | Ocean Discharge |
| Bulk chemical storage drains | Negligible | Retention & Ocean Discharge |
| Fireside and Air Preheater Wash | 0.04 | Retention & Ocean Discharge |
| Miscellaneous floor drains | 0.07 | Oil Removal, Retention & Ocean Discharge |
| Condensate demineralizer regeneration Wastes | 0.07 | Retention & Ocean Discharge |
| Metal Chemical Cleaning | 0.32 | Lime Precipitation, Retention, Sludge Disposal, & Ocean Discharge |
| Mobile Reverse Osmosis Unit Wastes | 0.003 | Retention & Ocean Discharge |

Figure 2.3.1 is a station map showing the relative location of all of the contributing flows and sampling points throughout the station.

Monitoring requirements for each sampling point are listed in Table 2.3.1. Specific sample collection points for the waste streams other than the outfalls are presented in Figures 2.5.4 to 2.5.10.

### 2.3.2 NPDES Permit Outfalls and Waste Streams, Parameters, and Sampling Requirements Overview

In accordance with Ormond's NPDES permit, discharges through the facilities outfalls are monitored for flow and chemical constituents at varying frequencies. In addition, water temperature is continuously monitored at the station's water intake.

Table 2.3.1 describes the facility outfalls / waste streams and presents the permit sampling requirements.

**Table 2.3.1. Facility outfalls and waste streams NPDES sampling requirements.**

| Constituent | Units | Type of Sample | Minimum Frequency of Analysis |
|---|---|---|---|
| Outfall 001 – Discharge | | | |
| Total waste flow[1] | gal/day | ---- | daily |
| Temperature[1] | $^{o}$F | continuous | ---- |
| pH | pH units | grab | weekly |
| Total residual chlorine[2] | mg/L | grab[3] | daily |
| Free available chlorine[2] | mg/L | grab[3] | daily |
| Chronic toxicity | TUc | grab | quarterly |
| Total coliform[4] | MPN/100ml | grab | quarterly |
| Fecal coliform[4] | MPN/100ml | grab | quarterly |
| Enterococci[4] | MPN/100ml | grab | quarterly |
| Priority Pollutant Metals | µg/L | grab | semi-annually |
| Hexavalent chromium | µg/L | grab | semi-annually |
| Acute toxicity | TUa | grab | annually |
| Ammonia nitrogen | µg/L | grab | annually |
| Nitrate nitrogen | mg/L | grab | annually |
| Radioactivity[5] | pCi/ml | grab | annually |
| Priority Pollutants | µg/L | grab | annually[6] |
| | | | |
| Outfall 002 - Intake | | | |
| Chronic Toxicity (dilution water) | | grab | quarterly |
| Priority Pollutant Metals | µg/L | grab | semi-annually |
| Hexavalent chromium | µg/L | grab | semi-annually |
| | | | |
| Metal Cleaning Wastes | | | |
| Flow (no flow-state in report) | mgd | ---- | monthly |
| pH | pH units | grab | monthly |
| Suspended solids | mg/L | grab | monthly |
| Oil and grease | mg/L | grab | monthly |

| Constituent | Units | Type of Sample | Minimum Frequency of Analysis |
|---|---|---|---|
| Copper, total | mg/L | grab | monthly |
| Iron, total | mg/L | grab | monthly |
| | | | |
| Non-Chemical Metal Cleaning Wastes | | | |
| Flow (no flow-state in report) | mgd | ---- | monthly |
| pH | pH units | grab | monthly |
| Suspended solids | mg/L | grab | monthly |
| Oil and grease | mg/L | grab | monthly |
| Copper, dissolved metal fraction only | mg/L | grab | monthly |
| Iron, dissolved metal fraction only | mg/L | grab | monthly |
| | | | |
| Low Volume Wastes | | | |
| Flow (no flow-state in report) | mgd | ---- | monthly |
| pH | pH units | grab | monthly |
| Suspended solids | mg/L | grab | monthly |
| Oil and grease | mg/L | grab | monthly |
| Priority Pollutants | µg/L | grab | annually[6] |
| | | | |
| Stormwater | | | |
| pH | pH units | grab | Opportunity[7] |
| Total Suspended Solids | mg/L | grab | Opportunity[7] |
| Specific conductivity | µmho/cm | grab | Opportunity[7] |
| Oil and Grease | mg/L | grab | Opportunity[7] |
| Total Organic Carbon (TOC) | mg/L | grab | Opportunity[7] |
| Iron (total) | mg/L | grab | Opportunity[7] |
| | | | |
| Fish Impingement Normal Operations | # of Fish/ invertebrates | 24-hour composite | Every two months |
| Fish Impingement Heat Treatment | # of Fish/ invertebrates | grab | As scheduled |

[1] Where continuous monitoring of temperature and flow is required, the following shall be included in the report:

Temperature: Only the maximum temperature for each calendar day shall be reported, except when temperatures exceed 105$^{o}$F, in which case the reason(s), time of day, and duration of such events shall also be reported.

Flow: Total daily flow.

[2] Monitoring is only applicable during periods of chlorine addition. A statement certifying that chlorination did not occur during the day may be submitted in lieu of an analysis.

[3] Multiple grab samples, with at least four equally spaced samples during each hour of chlorine addition, the maximum and average concentrations for the duration of chlorine addition shall be reported. Alternatively, a single grab sample may be collected at the time of peak residual chlorine concentration.

[4] The limit stipulated is a receiving water limit. The Discharger may sample the effluent to demonstrate compliance with the receiving water limit. If the effluent does not meet the limit stipulated in Section I.B.1 through I.B.3 (page 16) of Order No. 01-092, the Discharger must sample the receiving water as stipulated to demonstrate compliance.

[5] A statement certifying that radioactive pollutants were not added to the discharge may be submitted in lieu of monitoring.

[6] Sampling and analysis shall be completed annually. Analysis should include priority pollutants listed on page T-20 except metals listed in Section III. C. of the permit.

[7] During the first significant storm of the season and one subsequent storm.

### 2.3.3 Stormwater

Ormond has implemented a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the general NPDES permit for stormwater discharges. The sampling requirements are presented in Table 2.3.1 above and sampling points are depicted in Figures 2.5.5 and 2.5.9. Station personnel are directed to the complete SWPPP for more detailed information.

### 2.3.4 Fish Impingement

Fish impingement is currently monitored by an outside contractor, during two distinct operational modes, normal operation and heat treatments. The sampling point for monitoring fish impingement is depicted in Figure 2.5.10 and detailed in Section 3.5.2 of this manual.

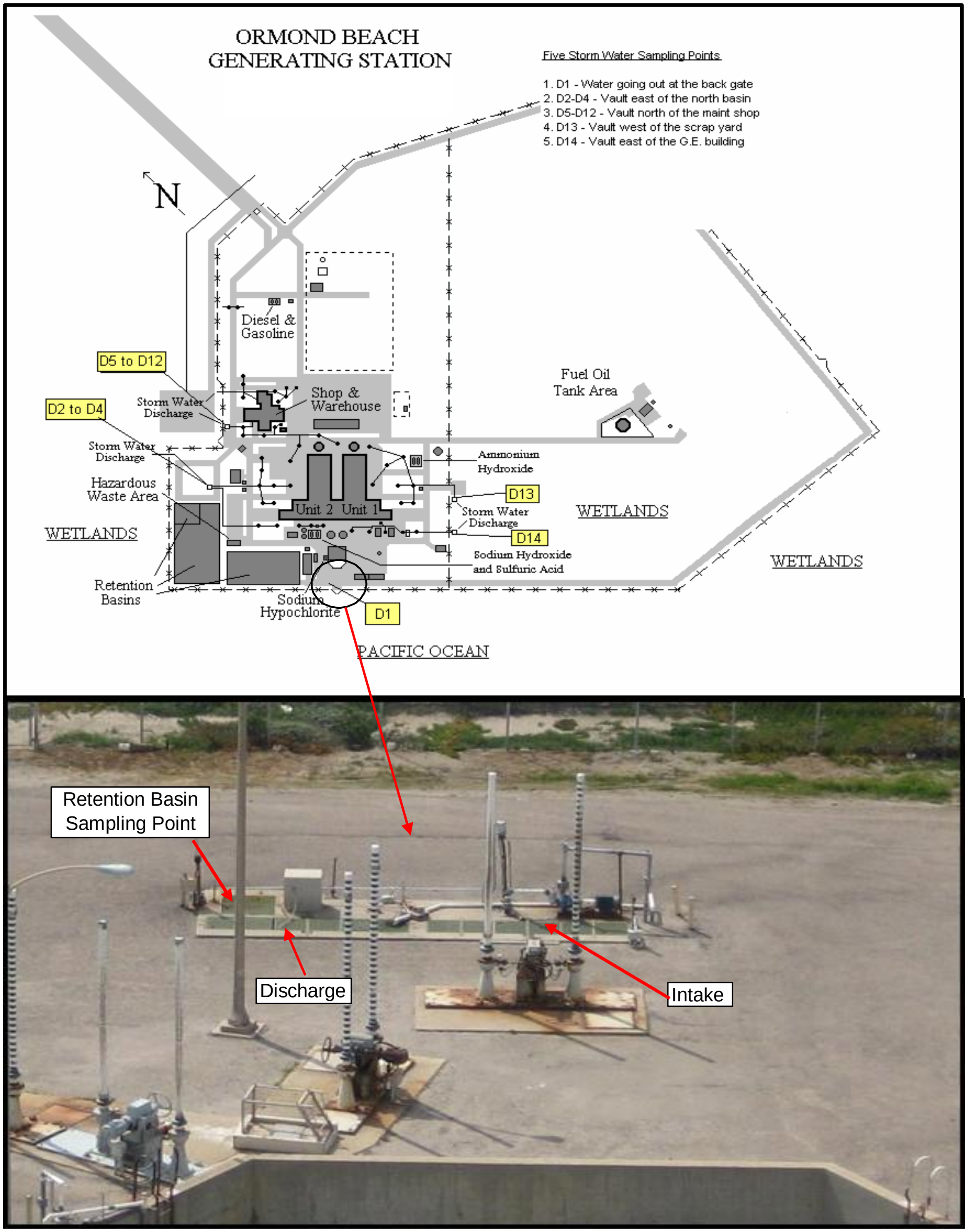


**Figure 2.3.1 Ormond Beach Station sampling points.**

## SECTION 2.4 SAMPLING PREPARATION AND RECORDKEEPING

### 2.4.0 Sampling Container and Equipment Preparation

2.4.0.1 Sampling Containers

Before the sampling technician collects any NPDES surface water samples, all sampling containers must be inspected for cleanliness. Clean sample containers are usually provided to the station by the contract laboratory. Sample containers should be clean and replaced after every use. Should any sample container appear to be contaminated, it should be properly disposed of and replaced by a clean container from the supplier.

2.4.0.2 Sample Labeling and Identification

Water samples collected to be shipped to an outside laboratory for analysis must be properly labeled to avoid confusion and possible loss. Information that must be transmitted to the outside laboratory via the sample labels should include:

- Station identification (should be preprinted)
- Outfall identification (should be preprinted)
- Date and time sample collected (completed by technician at time of sampling)
- Sampler's name (completed by technician at time of sampling)
- Sample number and type (should be preprinted)
- Preservative (should be preprinted)
- Analysis requested (should be preprinted)
- Split number if more than one container is used for a single analyte at any station, i.e. -01, -02, -03 (completed by technician at time of sampling)

The labels for containers prepared by an outside laboratory normally have a label preprinted in advance with as much collection data as possible (outfall, date, preservation method, and analysis requested). When preparing samples for in-plant sampling, the labels should be as complete as possible in advance of the sample collection. The date, time and sampler's name should be completed as the samples are collected to avoid incorrect information should the collection be delayed or performed by other personnel than anticipated. Any incorrect labels should be removed and discarded and the sample re-labeled with the correct information to avoid any confusion. A permanent, waterproof marker or pen (e.g. a Sharpie or similar brand) must be used to label the sample containers. It is recommended that all labels for samples sent to an outside laboratory be covered by clear, adhesive packing tape after the label is completely filled out. The tape should cover the label and adhere to the sample container several inches to each side. If it is possible that the label will be exposed to wet ice or water, the tape should completely wrap the sample bottle with ends that overlap. Samples collected for in-house analysis must be logged in. At the discretion of the chemical technician, the labels provided by outside laboratories may be replaced by the station specific labels printed on weather resistant labels.

2.4.0.3 Sampling Equipment

A checklist of equipment required to obtain and document the collection of the field samples is presented in Table 2.4.1. When practical, duplicate equipment and replacement parts should be stocked in the event of unexpected failures during field sampling. An insulated cooler or container must be used to store and transport the samples to the laboratory. Wet ice must be used to chill the sample to approximately 4$^{o}$C, but not freeze the samples.

### 2.4.1 Laboratory Records

Keeping complete, accurate laboratory records is one of the most important components of an effective Quality Assurance (QA) program. These records allow the validation of any sampling/analysis conducted by the station for both in-plant and contracted laboratories. The sampling and laboratory technicians are responsible for completing and maintaining these records. Laboratory records include field sampling data/Chain-of-Custody (CoC) forms, in-house analysis records, and laboratory/field test equipment calibration/maintenance records. These records must be maintained in permanent files such as logbooks, binders, etc. Accurate sample identification following proper labeling techniques is also an important part of the QA program.

2.4.1.1 Field sampling Data/Chain-of-Custody Forms

All important specific sampling and data gathered in the field is documented on the field sampling data/CoC form. Strict CoC procedures provide a paper trail for documenting the progress of samples from the time of collection through laboratory processing and final disposition. This documentation becomes especially important should the samples and the laboratory analysis results become subject to use as evidence in litigation. Even when not subject to litigation, the form provides a useful control over routing of the samples.

Field sampling data/CoC forms contain the following information:

- Station
- Name(s) of sampler(s) and/or person(s) performing any on-site analysis (record the names of any observers e.g. personnel from EHIS or CRWQCB)
- Monitoring point identification
- Sample number
- Date of sample collection (yymmdd)
- Times the samples were collected and analyzed for field parameters (military time)
- Sample type (grab or composite)
- Number of containers for each monitoring point
- Analysis required
- Number of containers being shipped to receiving laboratory per sample
- Comments (should include explanation of any notations made on the record sheet, variations in materials and equipment used, problems encountered during sampling, etc.)

- Relinquishing signature, sample transporter (other than commercial courier e.g. FedEx or UPS), and receiving laboratory signatures

The field sampling data/CoC forms provided by contract laboratories can be single sheets or duplicate/triplicate (NCR) forms. If a single sheet CoC is provided, a photocopy of the CoC should be retained in the stations files. If duplicate/triplicate forms are provided, the last sheet should be retained for the station's files and the other sheets should accompany the samples. Also kept in the station's files are any forms pertaining to in-house analysis. All applicable information required by the forms must be completed by the sampler(s).

Recording all observations on these forms, particularly those that could affect the quality of the sample and/or subsequent analysis interpretation, is extremely important. Although observations may seem trivial or obvious at the time of sample collection, these details must not be trusted to memory. The information must be recorded as soon as possible. Information must be double-checked for accuracy and completeness.

The CoC must be signed, dated, and the time entered each time the custody of the sample(s) is transferred to another party (i.e. sampler(s) to station laboratory operator, to a courier service, to a contract laboratory). The original (and subsequent copies) must accompany the sample(s) when they are shipped via mail or common courier. These forms should be enclosed in a waterproof envelope and enclosed in the cooler with the samples or in a clearly identified envelope and attached to the outside of the shipping package. Upon arrival at the laboratory, the forms will identify the contents of the package. The receiving laboratory will sign and complete the CoC by including the date and time received at the laboratory. Any inconsistencies or damage to the samples can be immediately resolved and if not, resampling can be scheduled if necessary. A copy of the completed CoC is attached to the final results to provide a paper trail for the sample(s) from collection to final disposition.

Ormond has developed its own Sample Analysis Request & Chain of Custody forms that accompany the contract laboratories CoCs. These forms ensure the required analyses are listed on the contract laboratories' CoCs and assist the laboratory technician in verifying all samples for the specified period have been collected and sent for analysis. Examples of the in-house Sample Analysis Request & Chain of Custody forms are presented in Appendix A.

These forms are also used for documenting samples collected for purposes other than NPDES compliance (i.e. process water, non-regulated, etc.).

2.4.1.2 In-House Analysis Records

Worksheets documenting all measurements, calculations, and results for in-house analyses of samples must be prepared and maintained by the station laboratory technician under the direction of their supervisor. This applies to the routine monthly NPDES samples, the analytical program samples, and the annual EPA NPDES DMR QA program samples. These worksheets will document the manner in which the result was obtained should there be any question as to the results obtained. Because of increasing regulatory and public scrutiny of results reported, it is essential that the in-house analysis records be properly kept and maintained. The records for all the in-house analyses/calculations must be kept together in one central notebook or may be combined with the field sampling data/CoC forms.

2.4.1.3 Laboratory and Field Test Equipment Recordkeeping

Permanent files must be maintained in the Ormond laboratory to record periodic calibrations and maintenance checks performed on field and laboratory test equipment and accessories. Establishing routine testing, maintenance, and calibration of field and laboratory equipment will prevent problems that can affect data quality. The manufacturer's instruction manuals must be added to these records to provide instructions for testing/calibration and requirements for maintenance and calibration frequencies.

Documentation must be maintained in logbooks or other permanent files for each piece of equipment, which can be kept together for all equipment with separate sections for each piece of equipment. Field test and laboratory equipment may include pH meters, balances, analytical instruments, etc.

Each logbook must contain:

- Instrument name and model number
- Calibration schedules – records of calibrations including operator name, date and time, reagents used, results, and corrective actions taken on errors
- Maintenance schedules – records of maintenance performed on the equipment including date, time, operator, description of maintenance, problems observed and resolution (e.g. manufacturer servicing). The laboratory daily log should have a section for daily QA (e.g. pH analysis).

2.4.1.4 Flow and Monitoring Equipment Records

Where the use of continuous flow, temperature, and/or pH meters are required, written records of the calibration and maintenance performed on these meters must be maintained by the station in addition to the strip charts and other records.

### 2.4.2 Record Retention

All station records associated with NPDES sampling, analysis, and reporting must be retained for a minimum of three (3) years. These records include field data/CoC records, instrument calibrations and maintenance schedules, sample results calculations, flowmeter and pH meter strip charts, and laboratory analyses. ESIH retains the monthly NPDES reports, outside laboratory analyses, and field sampling data/CoC records indefinitely.

**Table 2.4.1. Equipment list for NPDES sampling at Ormond Beach Generating Station.**

1. Sample containers with appropriate labels and preservative(s)
2. Extra sample containers for each collection point
3. Insulated cooler with wet ice
4. Field sampling data/COC forms and clipboard
5. Pencils and waterproof marking pens
6. Personal Protective Equipment (PPE) hard hat, gloves, eye and ear protection, long pants, hard shoes or boots
7. Collection device i.e. beaker/cup, bailer, dipper, polyethylene bucket and rope

## SECTION 2.5 SAMPLE COLLECTION, ANALYSIS, PRESERVATION, AND DISPOSITION PROCEDURES

### 2.5.0 Introduction

The NPDES permit specifies the sampling point locations to be collected for the outfalls and waste streams. Figures 2.5.1 through 2.5.10 depict the sampling locations designed to comply with the NPDES permit requirements. Sampling from locations not Reliant-approved is unacceptable and all data from sampling points not approved will be invalid. All designated surface water sampling locations must be labeled with the appropriate outfall number or waste stream description.

### 2.5.1 Sample Types

Two types of samples are required by the NPDES permit, grab and composite:

- Grab sample – Defined as an individual sample collected over a period of time not exceeding 15 minutes. Grab samples represent only the condition that exists at the time the water sample is collected. Grab samples are used to characterize the wastewater stream at a particular instant in time. Certain parameters such as pH, temperature, residual chlorine, dissolved oxygen, fecal coliforms, and oil and grease must be evaluated as grab samples due to biological, chemical, or physical interactions that take place after sample collection which could affect the analyses results.

- Composite sample – Defined as a minimum of eight discrete samples taken at equal time intervals over the compositing period. If the flow rate does not vary more than 15% of the average flow rate, a time interval composite will provide a representative sample. If the flow rate is highly variable, a flow proportional composite sample will be required. Composite samples show the average condition of the wastewater stream discharged during a specific period. The composite samplers must be operated in accordance with the manufacturer's instructions.

  Note: Automatic composite samplers must be located or protected in a way to prevent freezing or vandalism (e.g. using an insulated housing or placing the unit inside treatment buildings). The units should be refrigerated and equipped with thermometers to verify that the samples are being preserved at $4^oC$.

### 2.5.2 Sample Preservation

Two methods (cooling and acidification) are used either singly or together to preserve the samples prior to analyses by the receiving laboratory. Table 2.5.1 outlines the proper preservation for each sample container.

**Table 2.5.1. The number of containers needed for each sampling location, the appropriate preservative for each parameter, recommended sample volume, and sample holding times.**

| Parameters | No. of Containers | Preservative | Sample Volume (ml)* | Holding Time |
|---|---|---|---|---|
| Outfall 001 (Discharge) | | | | |
| pH | 1 | none | 500 | Analyze immediately |
| Chlorine, free available | 1 | none | 100 | Analyze immediately |
| Chlorine, total residual | 1 | none | 100 | Analyze immediately |
| Coliforms, total and fecal | 1 | Cool, 4 ºC, 0.008% $Na_2S_2O_3$ | 100 | 6 hours |
| Enterococcus | 1 | Cool, 4 ºC, 0.008% $Na_2S_2O_3$ | 100 | 6 hours |
| pp- metals | 1 | $HNO_3$ to pH<2 | 1000 | 6 months |
| pp- hex chromium | 1 | Cool, 4 ºC | 500 | 24 hours |
| pp- mercury | 1 | Cool, 4 ºC, $HNO_3$ to pH<2 | 500 | 28 days |
| pp-voc | 2 | Cool, 4 ºC | 40 | 7 days |
| pp-semi voc | 1 | Cool, 4 ºC | 1000 | 7 days |
| pp- pesticides | 1 | Cool, 4 ºC | 1000 | 7 days |
| pp- PCBs | 1 | Cool, 4 ºC | 1000 | 7 days |
| Ammonia | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 1000 | 28 days |
| Cyanide | 1 | Cool, 4 ºC, NaOH to pH>12 | 1000 | 14 days |
| Dioxin | 2 | Cool, 4 ºC | 1000 | 30 days |
| Nitrate | 1 | Cool, 4 ºC | 500 | 48 hours |
| Phenols | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 1000 | 28 days |
| Radioactivity | 1 | Cool, 4 ºC | 1000 | 5 days |
| Specific conductivity | 1 | Cool, 4 ºC | 500 | 28 days |
| Toxicity, acute | 1 | Cool, 4 ºC | 10L | 24 hours |
| Toxicity, chronic | 1 | Cool, 4 ºC | 10L | 24 hours |
| | | | | |
| 002 - Intake | | | | |
| Coliforms, total and fecal | 1 | Cool, 4 ºC, 0.008% $Na_2S_2O_3$ | 100 | 6 hours |
| Enterococcus | 1 | Cool, 4 ºC, 0.008% $Na_2S_2O_3$ | 100 | 6 hours |
| pp- metals | 1 | $HNO_3$ to pH<2 | 1000 | 6 months |
| pp- hex chromium | 1 | Cool, 4 ºC | 500 | 24 hours |
| pp- mercury | 1 | Cool, 4 ºC, $HNO_3$ to pH<2 | 500 | 28 days |
| Toxicity, acute | 1 | Cool, 4 ºC | 10L | 24 hours |
| Toxicity, chronic | 1 | Cool, 4 ºC | 10L | 24 hours |

| Parameters | No. of Containers | Preservative | Sample Volume (ml)* | Holding Time |
|---|---|---|---|---|
| Low Volume Wastes (Boiler Blowdown & Rentention Basins) | | | | |
| pH | 1 | none | 500 | Analyze immediately |
| Oil and Grease | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 1000 | 28 days |
| Total Suspended Solids | 1 | Cool, 4 ºC | 1000 | 7 days |
| pp- metals | 1 | $HNO_3$ to pH<2 | 1000 | 6 months |
| pp- hex chromium | 1 | Cool, 4 ºC | 500 | 24 hours |
| pp- mercury | 1 | Cool, 4 ºC, $HNO_3$ to pH<2 | 500 | 28 days |
| pp-voc | 2 | Cool, 4 ºC | 40 | 7 days |
| pp-semi voc | 1 | Cool, 4 ºC | 1000 | 7 days |
| pp- pesticides | 1 | Cool, 4 ºC | 1000 | 7 days |
| pp-PCBs | 1 | Cool, 4 ºC | 1000 | 7 days |
| Cyanide | 1 | Cool, 4 ºC, NaOH to pH>12 | 1000 | 14 days |
| Dioxin | 2 | Cool, 4 ºC | 1000 | 30 days |
| Phenols | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 1000 | 28 days |
| Iron (total) | 1 | $HNO_3$ to pH<2 | 500 | 6 months |
| | | | | |
| Stormwater | | | | |
| pH | 1 | none | 500 | Analyze immediately |
| Total Suspended Solids | 1 | Cool, 4 ºC | 1000 | 7 days |
| Specific conductivity | 1 | Cool, 4 ºC | 500 | 28 days |
| Oil and Grease | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 1000 | 28 days |
| Total Organic Carbon (TOC) | 1 | Cool, 4 ºC, $H_2SO_4$ to pH<2 | 500 | 28 days |
| Iron (total) | 1 | $HNO_3$ to pH<2 | 500 | 6 months |

* Sample volume and containers may vary depending upon the analysis method

2.5.2.1 Preservation by Cooling

Samples requiring cooling must be kept in the refrigerator and then by using only wet ice during storage/shipping/delivery until they are analyzed. The appropriate cooling temperature is 4°C or 39°F. Cooling the samples slows the bacterial growth, which in turn inhibits bacterial solubilization of particulate matter. Cooling also stabilizes/inhibits chemical and physical reactions that may affect analysis results.

2.5.2.2 Preservation by Acidification

Samples for metals, volitiles, and other specific analytical parameters require the addition of acids for preservation. Adding acids to the appropriate sample containers should be done by the sampler or prepared in advance by the laboratory. Acids used to preserve sample integrity include sulfuric acid ($H_2SO_4$) and nitric acid ($HNO_3$). Approximately 2 ml of acid is sufficient to attain a pH <2 in samples of 1000 ml or less.

2.5.2.3 Reagents and Standards

A chemical supply house (i.e. Fisher Scientific) provides most of the reagents and standards to the station laboratories. All solutions are made, standardized, bottled, labeled, and shipped with strict quality control. All containers are sealed to assure non-contamination. If the seal is broken, the solution must be discarded as suspect. The label on the reagent container should indicate the solution name, concentration, preparation date, shelf life date, and any warning information. All reagents must be replaced upon expiration of shelf life. The labels on each container must be checked to verify that the purity of the reagents meets the needs of the particular method used. If standards and solutions are mixed by the station laboratory, procedures provided by the Environmental and Chemistry Support or as approved by regulatory agencies must be followed, and a copy of those procedures kept in the laboratory at all times. Fresh, pure reagents must always be used. Reagent containers must never be reused.

All reagents must be replaced upon expiration of shelf life or according to the following replacement schedule presented in Table 2.5.2.

**Table 2.5.2. Reagent replacement schedule.**

| Reagent | Replacement |
|---|---|
| Potassium Chloride (KCl) | Yearly |
| Sulfuric Acid ($H_2SO_4$) | Every 3 years or sooner, if color changes |
| Nitric Acid ($HNO_3$) | Yearly, sooner if color changes |
| Buffer Solution (pH 4.0 and 7.0) | Expiration date, or sooner if turbid appearance |

If any reagent becomes contaminated or is suspected to be contaminated, it must be discarded and replaced. Evaporation may affect the reagent’s strength requiring replacement if the reagent bottle is frequently open, or contains only a small amount of reagent.

Original labels must remain on all reagents and solution containers. If the reagent or solution is transferred into another container for use in the field or laboratory, the container must be properly labeled with Right-to-Know and fire safety labels.

### 2.5.3 Sample Holding Times

Because pH and Total Residual Chlorine are highly susceptible to changes in ambient conditions, they must be determined within 15 minutes of sample collection in the field or at the Ormond laboratory.

The remaining parameters are to be analyzed by the appropriate offsite laboratory. Table 2.5.1 shows that the length of time that the samples can be held prior to testing is highly variable, i.e. between 6 hours and 28 days. Therefore, the samples must be transported to the appropriate laboratory as soon as possible.

### 2.5.4 Sample Container and Equipment Requirements

Table 2.5.1 describes the number of containers needed for each sampling location, the appropriate preservative for each parameter, recommended sample volume, and sample holding times. The recommended sample volumes are greater than the minimum volume necessary to perform the analysis to ensure adequate sample in case of errors or duplicate analyses. Additional sample volume may also be used for periodic quality control samples for audit purposes.

A checklist of equipment necessary to obtain and document the collection of samples is presented in Table 2.4.1. The list assumes prior sample container preparation by the contract laboratory or supplier prior to the time of collection. An insulated cooler must be used to store and transport the samples. Wet ice should be used as the refrigerant to cool the sample to approximately $4^{o}C$ without freezing the sample. Dry ice must never be used to refrigerate the samples because it will freeze the sample and make the analysis invalid.

### 2.5.5 "Clean Hands / Dirty Hands" Sampling

Although the normal sampling procedure is adequate for most conventional parameters, the potential for sample contamination due to sampling procedures is high. For analytes of concern, the "clean hands/dirty hands" sampling technique (EPA Method 1669, discussed in more detail below) will greatly reduce the potential for sample contamination during the sampling process.

The following is a summary of the EPA Method 1669, "clean hands/dirty hands" technique:

- Two people - one designated "clean hands", one designated "dirty hands".
- Sample bottles and equipment are cleaned in the laboratory and double bagged.
- "Cleans hands" person only touches inner bag and sample bottle, NOTHING ELSE!
- "Dirty hands" person handles the outer bag and any sampling equipment.
- Laboratory prepared sampling equipment.
- Extreme awareness of potential sources of contamination (boats, atmosphere, dental fillings, jewelry, etc.).
- Analysis at "clean" laboratories.

### 2.5.6 Sample Collection and Flow Measurements

Prior to sample collection, sample containers (Table 2.5.1) and the equipment listed in Table 2.4.1 must be mobilized.

Sample collection should always be representative of the effluent quality. For example, if a condition at a particular sample site occurs once out of every ten sampling events, then the sampling should be scheduled to include that condition once out of every ten sampling events. The condition should not be avoided entirely or sampled more often than the condition exists. In another example, a schedule requires weekly samples to be taken on the same day week after week is appropriate for a discharge that is not expected to vary significantly from day to day or to vary in any particular pattern. In this case where discharge quality varies but not in a regular pattern, samples collected at the same time and on the same day each week will eventually cover the variety of discharge conditions. Furthermore, effluent limitations contained in the NPDES permit are applicable at all times and not just while sampling occurs.

2.5.6.1 Sample Collection Techniques

The wide variety of conditions existing at the different sampling locations requires that good judgment be exercised when collecting representative NPDES samples. There are basic guidelines described below, however, that always apply to sample collection and that must be followed carefully by the sampler(s).

- Samples must be collected where the wastewater is well mixed, near the center of flow where the turbulence is the greatest. This applies to any point where a grab sample is taken or where the automatic composite sampler tubing (intake line) originates.

- When grab sampling weir overflows or pipe discharges, the sample container must be filled immediately at the point of overflow or discharge, prior to the point where the wastewater enters or mixes with other water streams.

- When composite sampling or grab sampling, if a “transfer” takes place (e.g. pouring wastewater from a composite collection container for lab use) be certain the contents of the container are fully mixed prior to pouring so that the resulting sample is representative (i.e. if suspended iron solids are in the sample, without proper transfer, they could be left in the composite collection container and the laboratory will get unrepresentative data).

- When grab sampling quiet/wide/more undisturbed water discharges, skimming the water surface or dragging the channel bottom must be avoided. Care must be taken to avoid disturbing areas of settled solids or other debris. Floating debris must also be avoided. The sample container must be submerged below the water surface, with the container mouth facing upstream into the flow. Never submerge a container that has been prepared prior to sampling with preservative, take the sample with equipment designed to capture the sample below the water surface (i.e. van Dorn sampler) and transfer the sample into the container with the preservative.

- A minimum airspace (headspace) should be left in any sample container after filling them with sample water, except for a fecal coliform sample, where an inch of space must be left in the sample container to allow for mixing during the analysis. If a sample that must be analyzed immediately (i.e. pH, Total Residual Chlorine, etc.) will not be completed at the sampling location, no headspace should be left in the sample container.

- Remember to mark/label all sample containers prior to sampling. Except for pre-preserved sample bottles, rinse out all sample containers with sample water. Leave no headspace when filling the sample containers.

2.5.6.2 Sample Collection Points and Descriptions

2.5.6.2.1 Discharge and Intake samples are collected utilizing a pump located in the metal housing on the ocean side of the screen well area with a Tygon hose inserted into the proper tunnel.

2.5.6.2.2 Outfall 001 - Discharge

The hose is inserted through the hole in the grate directly in front of the pump housing for the discharge sample. The hose is dropped into the discharge flow and the pump run for 10 minutes prior to clear any water in the system. The sample is collected in a sampling beaker or cup from the PVC nipple located in the front of the pump housing. Fill and rinse the beaker three times prior to collecting a sample to fill the appropriate sample bottles. Care must be taken when filling the sample bottles. Sample bottles should not be filled to overflowing or directly from the nipple because some bottles contain preservatives (usually acids) and over filling may affect the sample analysis if the sample is not preserved properly. An overview of the sampling area is presented in Figure 2.5.1 and a more detailed view of the Discharge sample point is presented in Figure 2.5.2.

2.5.6.2.3 Outfall 002 - Intake

The hose is inserted through the hole in the grate to the right (when facing the ocean) of the pump housing for the intake sample. The hose is dropped into the intake flow and the pump run for 10 minutes prior to clear any water in the system. The sample is collected in a sampling beaker or cup from the PVC nipple located in the front of the pump housing. Fill and rinse the beaker three times prior to collecting a sample to fill the appropriate sample bottles. Care must be taken when filling the sample bottles. Sample bottles should not be filled to overflowing or directly from the nipple because some bottles contain preservatives (usually acids) and over filling may affect the sample analysis if the sample is not preserved properly. An overview of the sampling area is presented in Figure 2.5.1 and a more detailed view of the Intake sample point is presented in Figure 2.5.3.

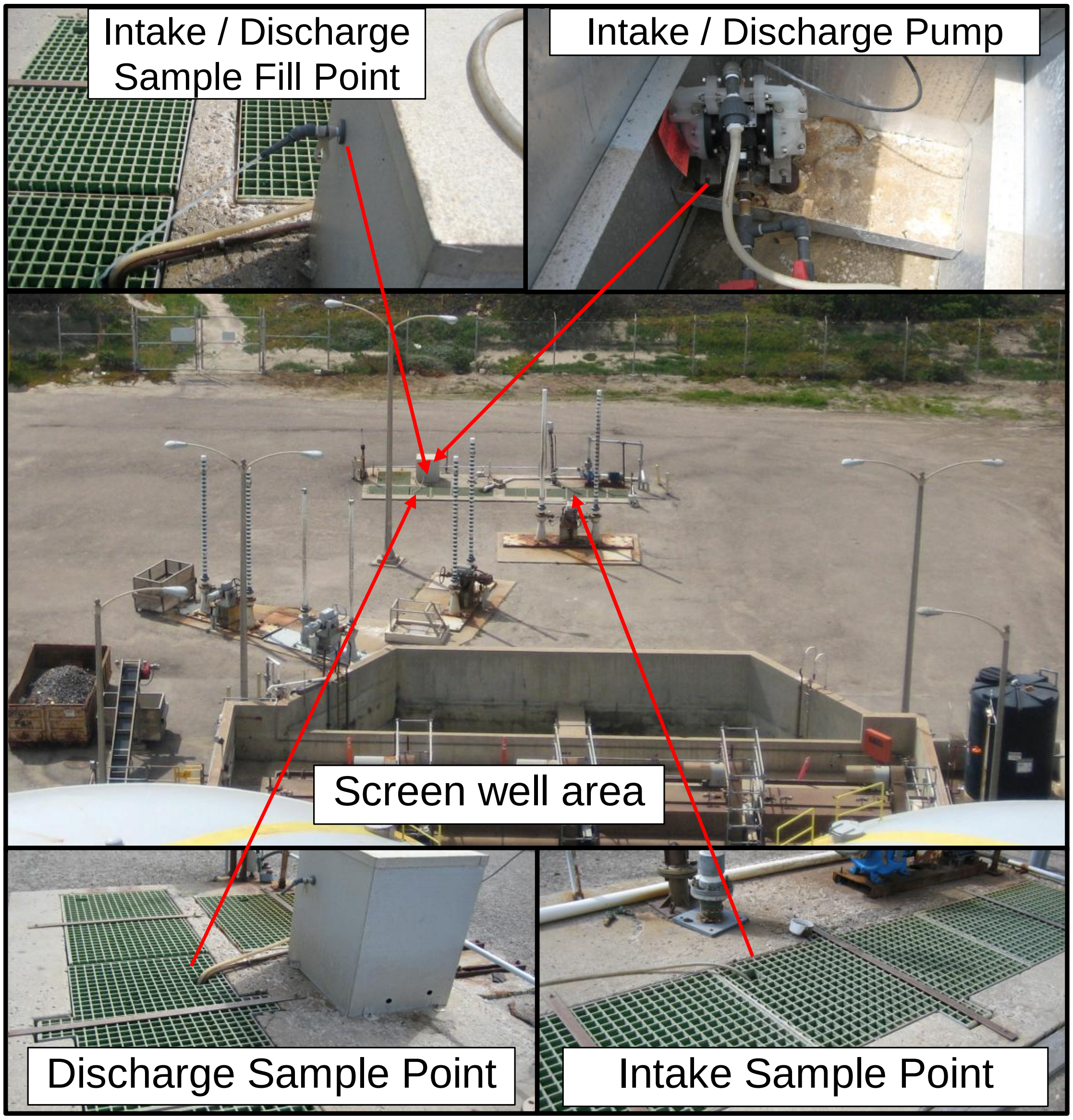


**Figure 2.5.1. NPDES Outfall 001 Discharge and 002 Intake collection points.**

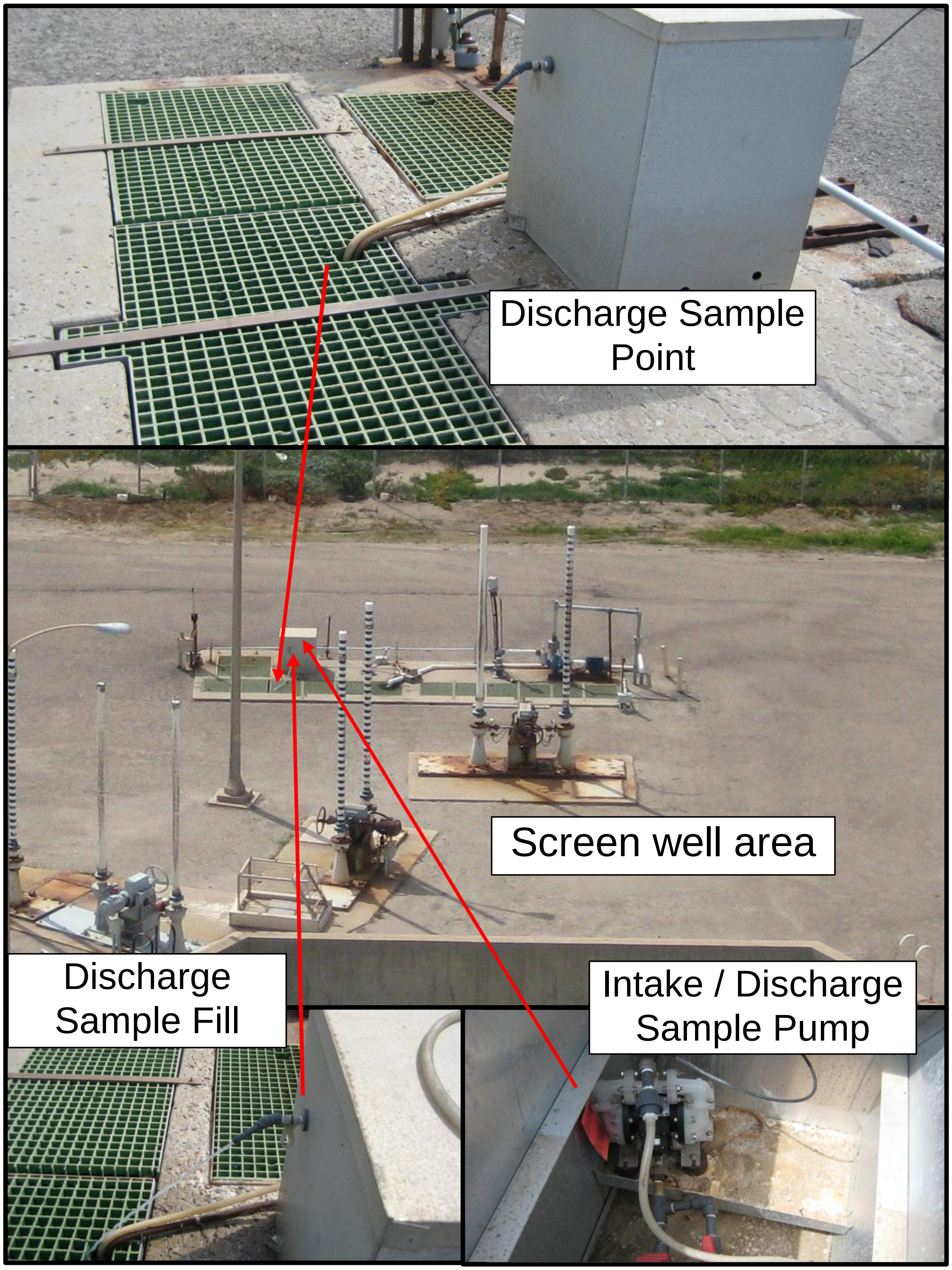


**Figure 2.5.2. NPDES Outfall 001 Discharge (water chemistry and toxicity testing collection point).**

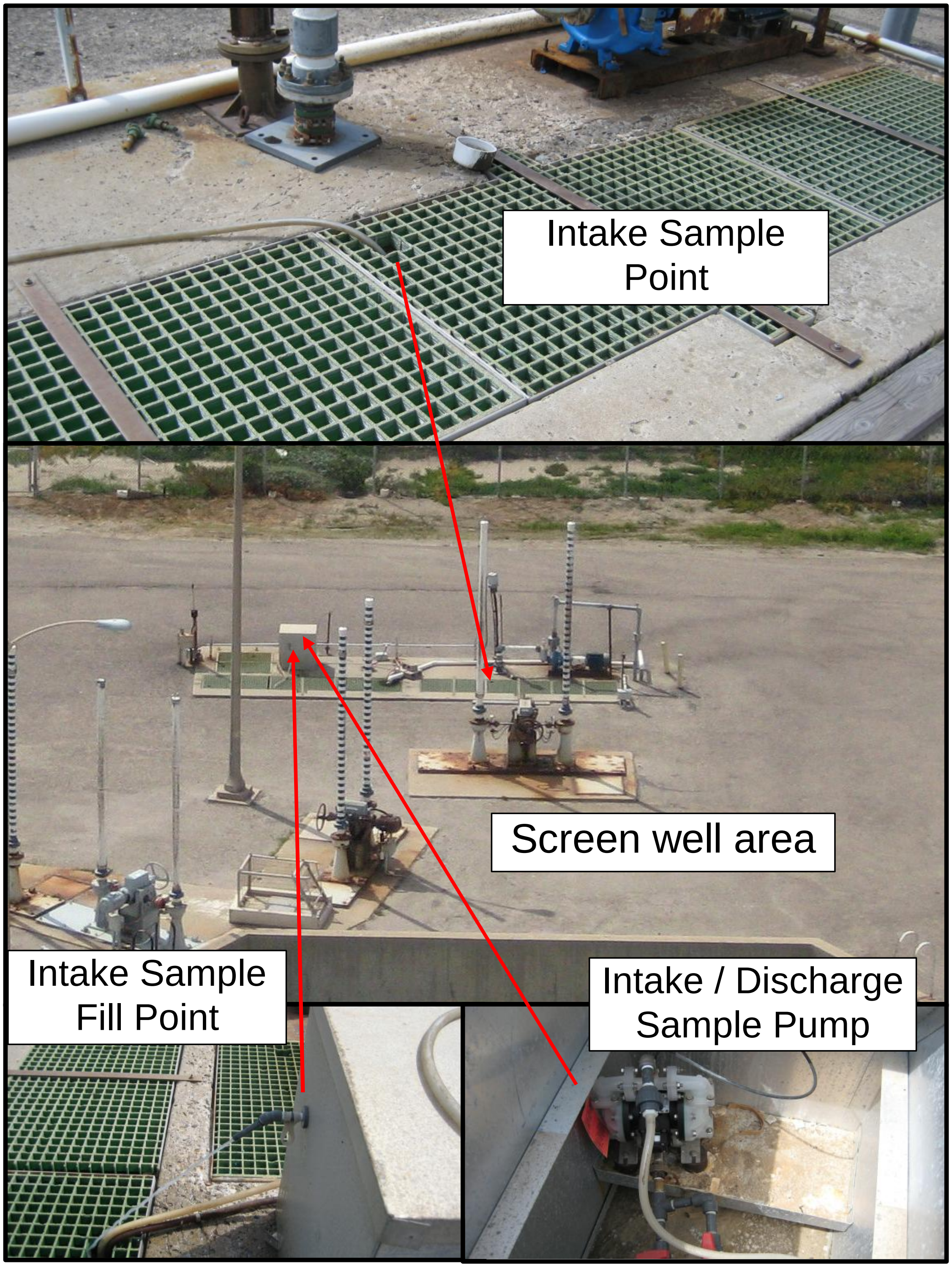


**Figure 2.5.3. NPDES Outfall 002 Intake (water chemistry and toxicity testing collection point).**

2.5.6.2.3 Retention Basin samples are collected at the end of the pipe located near the discharge sampling point. The green grate is lifted and the samples are collected at the end of the retention basin discharge pipe prior to entering the main discharge flow. A detailed view of the retention basin collection point is presented in Figure 2.5.4.

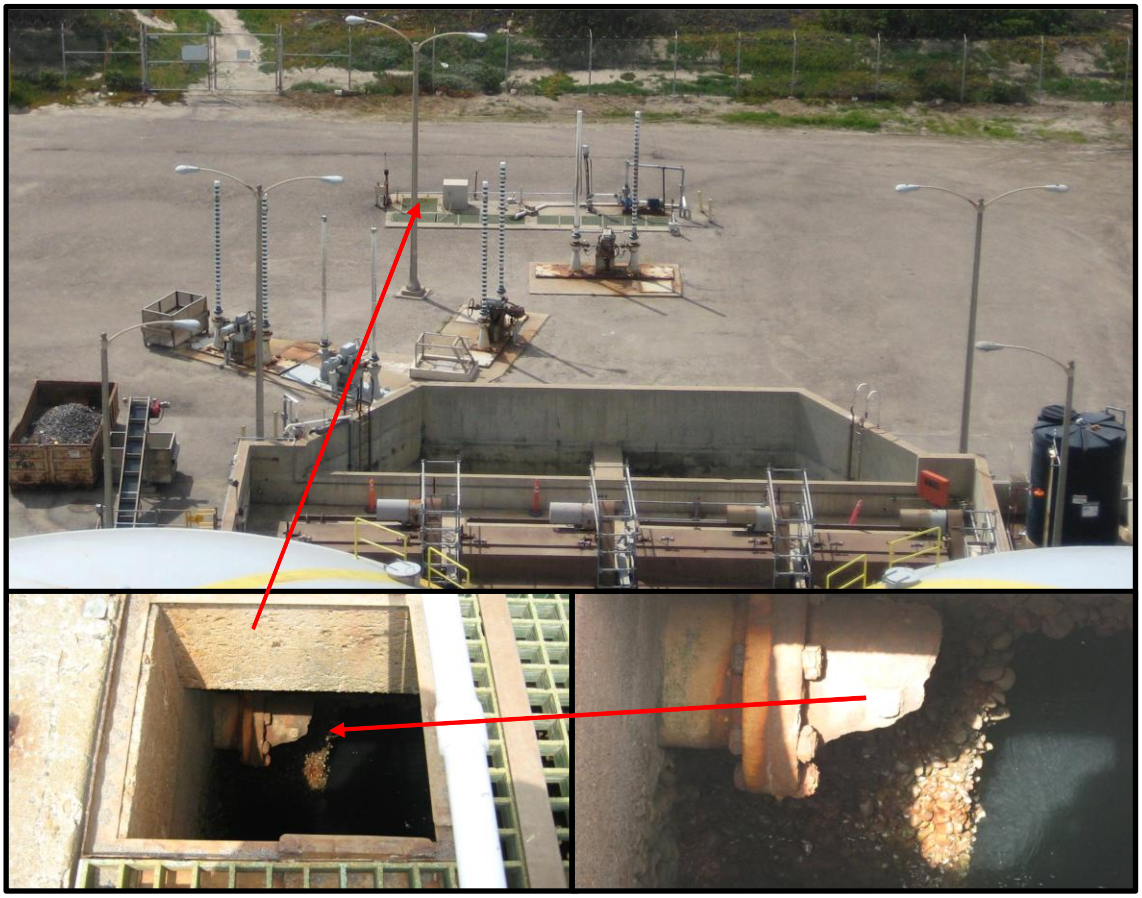

**Figure 2.5.4. Retention Basin sampling point.**

2.5.6.2.4 Storm Water sampling is performed at five locations within the station's perimeter. There are five different designated sample collection points (Figure 2.3.1 and Figures 2.5.5 through 2.5.9):

- Back Gate (D1): Any low area between the back gate and the south retention base along the stations west perimeter fence.
- North West Yard Drain (D2-D4): Yard drain east of the north retention basin.
- North East Yard Drain (D5-D12): Yard drain east of the contractor's gate.

- South East Yard Drain (D13): Yard drain west of the metal scrapyard.

- South West Yard Drain (D14): Yard drain south east of the insulator building.

**Figure 2.5.5. Stormwater collection point D1 Back Gate (between gate and so. retention basin).**

Figure 2.5.6. Stormwater collection point D2 - D4 North West Yard Drain east of the north retention basin.


**Figure 2.5.7. Stormwater collection points D5 - D12 North East Yard Drain east of contractor's gate.**

Figure 2.5.8. Stormwater collection point D13 South East Yard Drain west of the metal scrapyard.

**Figure 2.5.9 Stormwater collection point D14 South West Yard Drain south east of the insulator building.**

2.5.6.2.5 Fish impingement and Heat Treatment sampling is located at the intake structure (Figure 2.5.10)

**Figure 2.5.10. Fish impingement collection point.**

2.5.6.3 Flow Measurements

Flow rates are calculated by multiplying the run time from the pumps watt-hour meters by the pump design data. All units of flow rate must be reported in millions of gallons per day (mgd). Flow measurements obtained in other units must be converted to mgd using the appropriate conversion chart for the device used to make the measurement.

### 2.5.7 Sample Disposition

Before the samples are prepared for shipment, the field sampling data/CoC form must be checked for completeness and accuracy, including for all signatures.

The samples that must be sent to an outside laboratory for analysis must be delivered to that laboratory as soon as possible due to the short holding times for some parameters. For example, Coliform (total and fecal) and enteroccocus samples have a maximum hold time of 6 hours; hexavalent chromium has a maximum hold time of 24 hours; and turbidity, biochemical oxygen demand (BOD), phosphate, have a maximum hold time of 48 hours. To expedite the sample delivery, make arrangements for shipping or delivery prior to sample collection. Station laboratory personnel must be certain the delivery will be made on time. The sooner a sample is analyzed, the more reliable are the results.

To prepare the sample package for shipment/delivery, the cooler must be completely sealed to prevent any tampering during transit. When addressing the package, the person in the receiving laboratory authorized to receive and inventory the contents must be identified. This person will then check the contents and accept custody for the samples from the delivery person and sign the field sampling data/CoC forms accordingly. Any special handling instructions required, such as refrigeration, must be clearly identified on the package. DOT has no special requirements for shipment of preserved samples. Deviations from the required handling or transport procedures must be noted on the field sampling data/CoC form.

### 2.5.8 Sample Analyses

If not performed in the field by the sampler(s), pH, Total Residual Chlorine (TRC), and Free Available Chlorine (FAC) must be measured in the station laboratory within 15 minutes of collection. Field pH (or lab pH), TRC, FAC, and field temperature must be recorded on the field data/CoC form. See the operating manuals for specific instructions for the operation and maintenance of the field equipment used for these measurements.
An excellent overall analytical procedure reference is the *Standard Methods for the Examination of Water and Wastewater*, latest edition.

### 2.5.9 Laboratory Responsibility

The laboratory receiving the samples must immediately take inventory of the sample containers and sign the CoC forms. If any sample containers were damaged in transport, the laboratory must immediately notify the Station Chemical Technician at 805) 986-7205, if not available notify the station control room (24 Hrs) at 805) 986-7201.

## SECTION 2.6 QUALITY ASSURANCE PROCEDURES

### 2.6.0 Environmental, Safety and Industrial Health Department (ESIH)

While the station is responsible for ensuring that all in-house, California Regional Water Quality Control Board (CRWQCB), and Environmental Protection Agency (EPA) requirements of NPDES monitoring are in compliance, ESIH is responsible for providing guidance, interpretations, and maintaining QA manuals. The objectives of the NPDES QA program are outlined in Section 1. To maintain the standards of the program, audits of the NPDES program may be performed as determined by Reliant management. The following should be included in the audits:

- Procedures used for collecting NPDES water samples
- Methods used for obtaining on-site measurements, including the calibration and maintenance of all field monitoring devices
- Sample custody records completion
- Sample analyses records from the station and outside laboratories
- Laboratory and field test equipment calibration and maintenance documentation

Qualified outside laboratories and consulting firms conducting NPDES sampling, preservation, analyses, and reporting functions for the station are required by their contract to adhere to CRWQCB, EPA, and Reliant-approved QA methods and requirements.

In addition to audits conducted by Reliant or an outside consultant, the station may be subject to audits/inspections by environmental regulatory agency personnel. Anytime such personnel collect NPDES-related samples for their own analyses, the station may choose to take duplicate samples for analyses to verify the results obtained by the regulatory agency. Each year, the station also participates in the EPA DMR QA study. ESIH obtains and distributes the required samples and prepares and submits the reporting packages to the providers and the agencies. Section 2.6.4 is the QA procedure that must be followed when NPDES samples are being split. ESIH can be contacted for more information.

### 2.6.1 Technical Services Chemistry Support Group

By station request, the Technical Services Chemistry Support Group will visit a station laboratory to review analytical techniques and resolve any questions brought up at that time. In addition, the Chemistry Support Group may evaluate contractor laboratories, periodically review station laboratory QA procedures, and review analytical group analysis results.

### 2.6.2 Station Quality Assurance

The station is responsible for ensuring compliance with all in-house and regulatory agency requirements of the NPDES monitoring program. Station responsibilities include:

- Operation and maintenance of field sampling and flow measurement equipment are in agreement with the manufacturers' instructions

- Calibration of field and laboratory analytical equipment

- Participation in the annual EPA DMR QA Study program and, if desired, in the analytical group QA program

- Complying with the QA program

- Performing QA samples for NPDES monitoring

### 2.6.3 Splitting Environmental Water Samples with Regulatory Personnel

2.6.3.1 Purpose

The purpose of this procedure is to document the steps to be followed when a representative of an environmental regulatory agency collects any environmental water sample for analyses to determine compliance with permits.

2.6.3.2 Scope

This procedure applies to all Reliant facilities where water samples may be taken. Such sampling points may include, but are not limited to, NPDES discharges, ground-water monitoring wells, drinking water systems, wastewater treatment systems, and impoundments.

2.6.3.3 Definitions

NPDES - National Pollution Discharge Elimination System

Permit - For the purposes of this procedure all applicable environmental permits, licenses, laws, regulations, consent order and agreements, compliance orders, approvals, programs, and Company policy.

Regulatory Agency - Any and all of the local, state, or federal agencies with authority to issue or revoke permits and enforce compliance, e.g., EPA, CRWQCB, etc.

2.6.3.4 References

- Federal Clean Water Act – 1977, as amended
- Safety Drinking Water Act

- NPDES and Ground-water Sampling QA Procedures Manual
- Standard Methods for the Examination of Water and Wastewater Manual
- Applicable permits

2.6.3.5 Instructions

Regulatory personnel (inspectors) conduct environmental inspections of Reliant facilities. On occasion, they will collect a sample(s) of a discharge stream, wells, etc. to determine compliance with applicable permits or if a system upset/noncompliance situation is suspected. Facility personnel may collect split sample(s) with the inspector and have the samples analyzed for the same parameters the inspector intends to analyze. Before sampling, facility personnel must determine what those parameters are, as this will affect sample type, containers, sample volume, preservatives, and holding time. Facility personnel can refer to their QA manuals or the Standard Methods Manual for this specific sample treatment information. Any deviance from approved or required sampling /analyses procedures on the inspector's part must be noted.

2.6.3.5.1 Sampling Procedures

Prior to sampling and after determining those parameters the inspector will analyze, facility personnel must prepare the appropriate sample containers. For certain parameters, sample containers must be prepared <u>in duplicate</u> and facility personnel must collect two identical samples. The additional facility sample <u>may</u> be analyzed by a reputable independent laboratory; in addition to the in-house analyses that will be performed normally by the station laboratory and/or contracted outside laboratory on the first duplicate facility sample. The independent laboratory may be called upon to conduct the identical analyses in the event there is a discrepancy between facility and the regulatory test results. This second duplicate must be held by the facility and analyzed only as a reference sample. The exceptions to this potential duplicate analyses requirement are for the measurement of those parameters with a holding time of 14 days or less such as pH, specific conductance, temperature, TSS, free/total chlorine residuals, MBAS, orthophosphates, etc. All other facility samples with holding time of 28 days or more are subject to analyses by two laboratories. ESIH can be contacted for guidance on accredited/certified laboratories.

2.6.3.5.2 Sample Collection Splitting

When the sample is drawn, sufficient volume must be collected to ensure both the inspector and the facility personnel can fill their sample containers from the same drawn sample. If possible, parallel samples must be avoided (each party draws a sample(s) consecutively and independently direct from the sampling point). Sampling must be properly documented through completion of field data/CoC forms. Normally, the inspector will collect the type of sample (grab, 24-hour composite, etc.) as required by the applicable permit. If not, such a deviance must be documented.

2.6.3.5.3 Sample Disposition

After the sample(s) are collected and split with the inspector, the required procedures for sample preservation and holding time must be followed. Again, any deviation from approved methods by the inspector must be noted. Any questions on these methods can be directed to ESIH. The facility samples must be analyzed/shipped to an outside laboratory as soon as possible to meet the holding time requirements. Facility personnel must request the following of any laboratory conducting analyses on such samples:

- Duplicate analyses must be conducted on another day as a repeatability check (analyses must be conducted within the required holding time).

- Preserved samples must be retained for the entire required holding time, especially metals samples.

Should the regulatory agency personnel fail to provide results of their analyses within the sample holding time, the second duplicate or reference sample must be analyzed by the independent laboratory no later than one week before the holding time expires.

# CHAPTER 3

# RECEIVING WATER MONITORING

## SECTION 3.1 RECEIVING WATER MONITORING OVERVIEW

### 3.1.0 Introduction

This chapter addresses permit requirements for receiving water monitoring studies for the Ormond Beach Generating Station which is owned and operated by Reliant Energy. The monitoring program is conducted in accordance with specifications set forth in National Pollutant Discharge Elimination System (NPDES) Monitoring and Reporting Program No. 2093 (Permit No. CA0001198) issued by the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) on 28 June 2001. The results of the surveys are compared among stations and with past physical and biological studies to determine if the generating station discharge is having an adverse effect on the marine environment, and if the beneficial uses of the receiving waters are being protected. Sampling includes:

- Water Column Monitoring
- Sediment Characteristics
- Mussel Bioaccumulation
- Biological Monitoring
    - Benthic Infauna
    - Fish Impingement

### 3.1.1 Scope of the Receiving Water Monitoring

The receiving water monitoring is contracted out to an environmental consulting firm due to the offshore nature of the studies to be performed. The monitoring program for the Ormond Beach Generating Station is conducted by MBC Applied Environmental Sciences (MBC) in accordance with specifications set forth in the NPDES Monitoring and Reporting Program. The monitoring program includes winter and summer water column profiling, summer sediment sampling for grain size and chemistry, mussel sampling for bioaccumulation, and summer biological sampling for benthic infauna. In addition, the impingement of fish and invertebrate species on the intake screens are monitored periodically (Section 3.5.2) and total yearly impingement estimated from monitoring results and plant operations.

The locations of the monitoring stations as described in the NPDES permit are shown in Figure 3.1.1. The monitoring program generally includes nine water quality (RW) stations, and six sediment/benthic infauna (B) stations. Latitude and longitude coordinates for all receiving water (RW) and benthic (B) stations are listed in Table 3.1.1. Modifications to this program may occur every five years (e.g. 2008) with the approval of the LARWQCB in exchange for Reliant Energy contribution to an ongoing and recurring regional monitoring program.

Field observations are conducted while occupying the above stations and include observations for red tides (plankton blooms), oil sheens, grease, floating particulates, miscellaneous debris, and ancillary observations of marine life (least terns, brown pelicans, whales, dolphins, seals, sea lions, etc.).

**Table 3.1.1. Latitude/longitude coordinates of sampling stations.**

| Stations | | | |
|---|---|---|---|
| Water Quality | Benthic | Latitude | Longitude |
| RW 1 | B 1 | 34° 07.70’ | 119° 10.98’ |
| RW 2 | B 2 | 34° 07.51’ | 119° 10.68’ |
| RW 3 | B 3 | 34° 07.44’ | 119° 10.46’ |
| RW 4 | B 4 | 34° 07.33’ | 119° 10.34’ |
| RW 5 | B 5 | 34° 07.10’ | 119° 10.06’ |
| RW 6 | B 6 | 34° 07.50’ | 119° 10.38’ |
| RW 7 | | 34° 07.17’ | 119° 10.72’ |
| RW 8 | | 34° 06.52’ | 119° 09.34’ |
| RW 9 | | 34° 08.16’ | 119° 11.78’ |

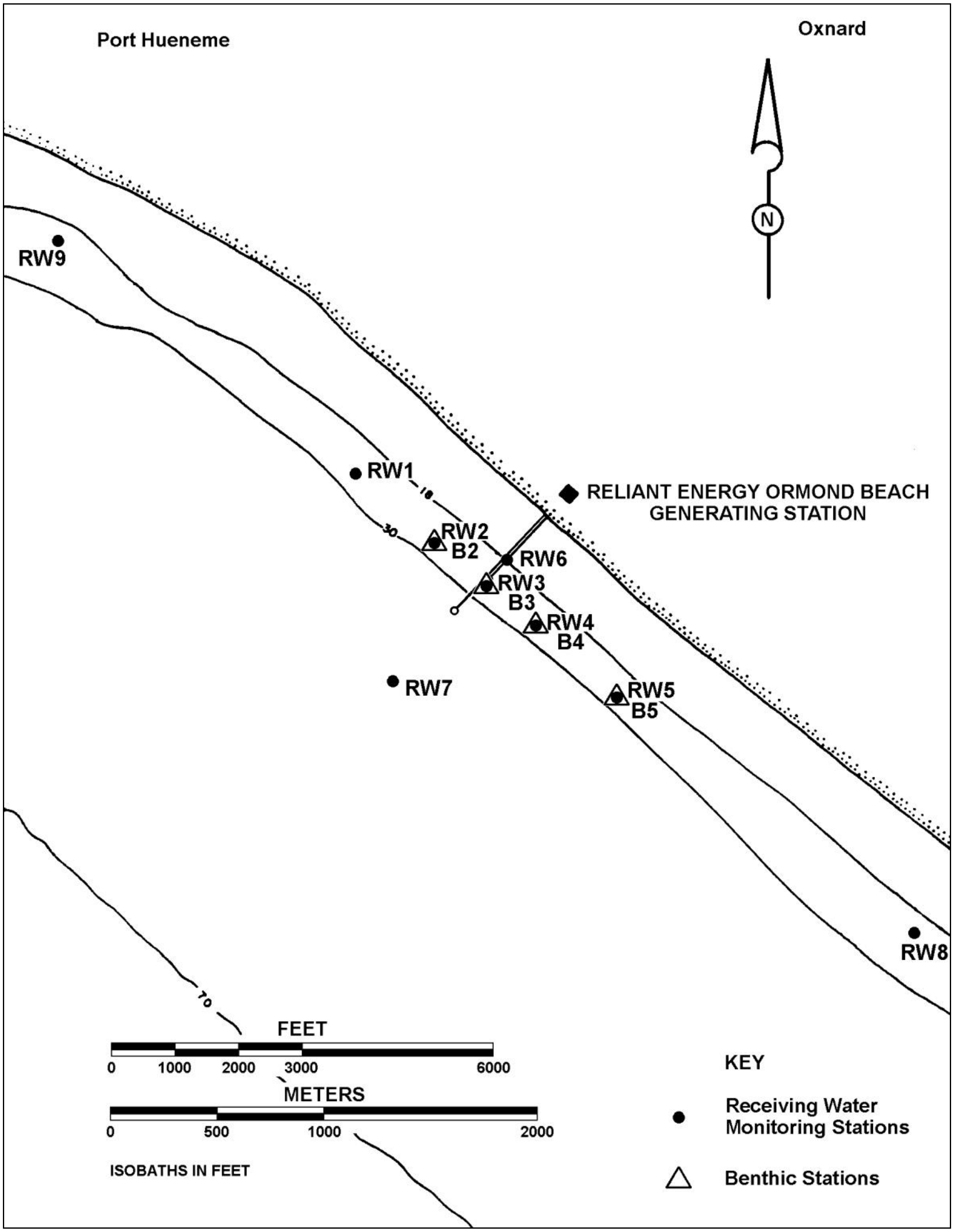

**Figure 3.1.1. Location of the offshore receiving water stations.**

### 3.1.2 Statistical Analyses

Summary statistics developed from the biological data include the number of individuals, which for trawls is expressed as both number per trawl and per standard sample area, and for infauna, number per grab and density per $m^2$; number of species; and Shannon-Wiener (Shannon and Weaver 1962) species diversity (H') index. The diversity equation is as follows:

Shannon-Wiener

$$H' = -\sum_{j=1}^{S} \frac{n_j}{N} \ln \frac{n_j}{N}$$

where: $H'$ = species diversity
$n_j$ = number of individuals in the $j^{th}$ species
$S$ = total number of species
$N$ = number of individuals

The Southern California Benthic Response Index (BRI) is an abundance-weighted average pollution tolerance of species occurring in a sample, and is a measure of the condition of marine and estuarine benthic communities (Smith et al. 2003). It classifies benthic communities as “reference” (i.e. undisturbed) or one of four levels of response to increased disturbance. The index formula is:

Benthic Response

$$BRI_s = \frac{\sum_{i=1}^{n} \sqrt[3]{a_{si}}\, p_i}{\sum_{i=1}^{n} \sqrt[3]{a_{si}}}$$

where: $BRI_s$ = BRI value for sampling unit $s_i$
$n$ = number of species with pollution tolerance scores in $s_i$
$p_i$ = pollution tolerance of species $i$
$a_{si}$ = abundance of species $i$ in $s$

Species pollution tolerances $p_i$ are determined during BRI development as the position of the abundance distribution of species $i$ on a gradient between the most and least disturbed sites. Species without pollution tolerance values are not included in the calculation. Pollution tolerance values are not assigned to species if the data are insufficient to assign a value. The index was developed for benthic samples that were sieved through a 1-mm mesh screen. Pollution tolerance scores were derived for coastal shelf samples for shallow (10-30 m deep), mid-depth (>30-120 m deep), and deep (>120-324 m deep) habitats, and for bay and harbor habitat samples, northern (Point Conception to Newport Bay) and southern (Dana Point to the U.S.-Mexico border). The species names for which scores are available are based on Edition 5 of the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT) list of invertebrate species (SCAMIT 2008).

Evenness (J’) is a measure of the degree to which a sampled community is dominated by one or a few species. Values of evenness range from 1.0 (all species with identical abundances) to 0 (Pielou 1977).

The evenness equation is as follows:

$$J' = \frac{H'}{\ln S}$$

where: J' = Evenness
H' = Shannon-Wiener Index
S = number of species within the community

Biological data are subjected to log transformations (when necessary) and classified (clustered) using NCSS 2000 Hierarchial Clustering (Hintze 1998). Cluster analysis provides a graphic representation of the relationship between species, their individual abundance, and spatial occurrence among the stations sampled. In theory, if physical conditions are identical at all stations, the biological community would be expected to be identical as well. In practice this is never the case, but it is expected that the characteristics of adjacent stations would be more similar than those distant from one another. The dendrogram shows graphically the degree of similarity (and dissimilarity) between observed characteristics and the expected average. The two-way analysis utilized in this study illustrates groupings of species and stations, as well as their relative abundance, expressed as a percent of the overall mean. Two classification analyses are performed on each set; in one (normal analysis) the sites are grouped on the basis of the species which occurred in each, and in the other (inverse analysis) the species are grouped according to their distribution among the sites. Each analysis involves three steps. The first is the calculation of an inter-entity distance (dissimilarity) matrix using Euclidean distance (Clifford and Stephenson 1975) as the measure of dissimilarity.

Euclidean distance

$$D = \left[ \sum_{1}^{n} \left( x_1 - x_2 \right) \right]^{1/2}$$

where: D = Euclidean distance between two entities
$x_1$ = score for one entity
$x_2$ = score for other entity
n = number of attributes

The second procedure, referred to as sorting, clusters the entities into a dendrogram based on their dissimilarity. The group average sorting strategy is used in construction of the dendrogram (Boesch 1977). In step three, the dendrograms from both the site and species classifications are combined into a two-way coincidence table. The relative abundance values of each species are replaced by symbols (Smith 1976) and entered into the table. In the event of extreme high abundance of a single species, abundance data are transformed using a natural log transformation [ln(x)].

3.1.3 Detection / Reporting Limits

Detection/reporting limits used in reporting chemistry results are interpreted as the smallest amount of a given analyte that can be measured above the random noise inherent in any analytical tool. Thus, any value below the detection/reporting limits cannot be considered a reliable estimate of analyte concentration. Therefore, where a test for a given analyte results in a level below the detection/reporting limit, a "none detected" (ND) value has been assigned. The complication of what numerical value to substitute for ND in statistical calculations is addressed by the Environmental Protection Agency (EPA 1989, Section 5.3.3). When values for a given analyte are ND for all stations, then means and standard deviations will also be considered ND. However, when an analyte is detected at some stations and not at others, statistical calculations can be made by substituting ND values with either (a) zero, (b) one-half the average detection limit, or (c) the average detection limit (EPA 1989). Determining which substitution to use is based on whether or not substantial information exists to support the historical presence or absence of a given analyte at the station location. Since chemistry analyses have repeatedly resulted in ND values at the same stations through past surveys, ND values have been replaced with zeros in performing statistical calculations. As the ability to detect chemicals in increasingly smaller concentrations has improved greatly with time, detection/reporting limits differ in virtually all past surveys; this would confound any yearly comparison if options (b) or (c) from above were used. Historical raw data are presented in the appendices for possible supplementary study.

## SECTION 3.2 WATER COLUMN MONITORING

### 3.2.0 Introduction

Water column measurements of physical and chemical characteristics such as water temperature, dissolved oxygen concentration, hydrogen ion concentration, and salinity are important components of the discharge monitoring program. Because biological communities exist in equilibrium within the marine environment, changes in the properties of these characteristics can result in potentially adverse impacts to these communities. As the properties within the receiving waters can vary naturally on a relatively small scale, water quality monitoring is designed to assess these parameters in a way that helps determine the scale of seasonal and tidally driven oceanographic influences with respect to the point of discharge. Long-term monitoring of these parameters can help determine whether deviations from expected patterns exist that may indicate impacts from the discharge on local biological communities and to determine whether the beneficial uses of the receiving waters remain protected.

### 3.2.1 Water Column Monitoring

Water quality monitoring is conducted at 9 receiving water (RW) stations located within the surrounding waters of the Ormond Beach Generating Station discharge (Figure 3.2.1). Stations RW1 through RW5 and RW8 and RW9 are positioned along the 30-foot (ft) isobath. Station RW6 is positioned along the 20-ft isobath and Station RW7 is positioned along the 40-foot (ft) isobath directly offshore the intake and discharge structures. Water temperature, dissolved oxygen concentration, hydrogen ion concentration, and salinity are recorded during ebbing and flooding tides, during winter and summer surveys.

Water samples are analyzed in the field using a multi-probe water quality analyzer. Monitoring at offshore stations is conducted using a Sea-Bird Water Quality Monitoring System (SBE 9/17). Data are processed using the Sea-Bird proprietary software (SeaSoft). The resulting data are imported into Microsoft Office Excel 2000 spreadsheets for further reduction and analysis. Vertical water quality profiles are constructed with SigmaPlot version 9. Color contour images depicting sea surface temperatures are constructed with TecPlot version 9.

3.2.1.1 Water Temperature

Offshore water temperatures (C°) are monitored during both the winter and the summer surveys at both the ebb and the flood tides. Temperature is measured throughout the water column from the surface to near bottom at one-meter intervals and are reported in both a tabular format and as graphic profiles that depict the entire water column.

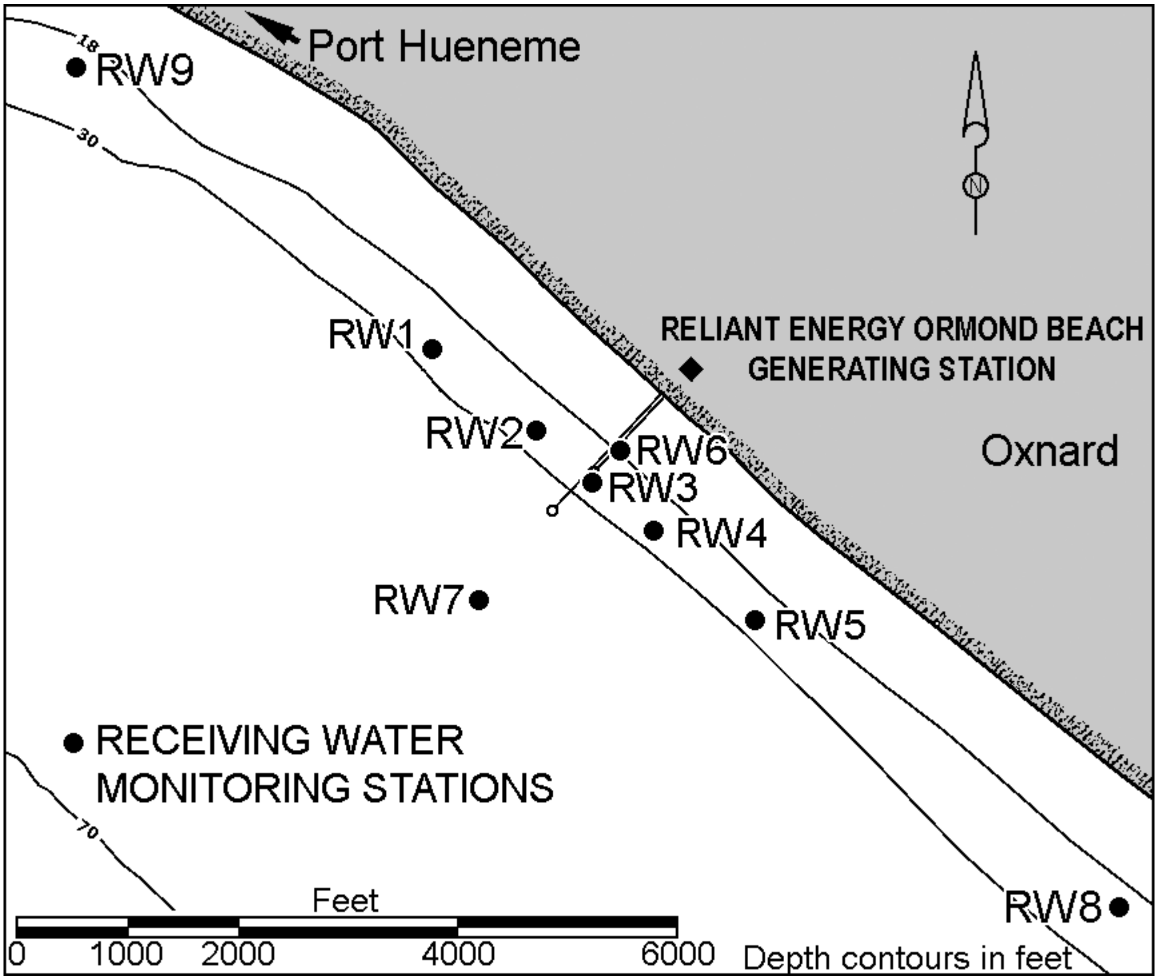


**Figure 3.2.1. Location of the water column sampling stations.**

3.2.1.2 Dissolved Oxygen Concentrations

Offshore water dissolved oxygen concentrations (mg/l) are monitored during both the winter and the summer surveys at both the ebb and the flood tides. Dissolved oxygen concentrations are measured throughout the water column from the surface to near bottom at one-meter intervals and are reported in both a tabular format and as graphic profiles that depict the entire water column.

3.2.1.3 Hydrogen Ion Concentration

Offshore water hydrogen ion concentrations (pH) are monitored during both the winter and the summer surveys at both the ebb and the flood tides. Hydrogen ion concentrations are measured throughout the water column from the surface to near bottom at one-meter intervals and are reported in both a tabular format and as graphic profiles that depict the entire water column.

3.2.1.4 Salinity

Offshore water salinity concentrations (psu) are monitored during both the winter and the summer surveys at both the ebb and the flood tides. Salinity concentrations are measured throughout the water column from the surface to near bottom at one-meter intervals and are reported in both a tabular format and as graphic profiles that depict the entire water column.

## SECTION 3.3 SEDIMENT CHARACTERISTICS

### 3.3.0 Introduction

Marine sediment characteristics are affected by both natural and anthropogenic influences. Tides, currents, and wave action all influence sediment grain size by suspending and transporting fine-grained material, resulting in coarser sediments in dynamic areas and finer sediments in areas of reduced currents and wave action. Coastal streams and rivers contribute sediments as well as contaminants to the marine environment, with variable influence from year-to-year depending on yearly rain amounts. In coastal environments, man-made structures such as jetties and breakwaters alter water movement and may result in changes in local sediment characteristics and deposition patterns, while sand replenishment projects can influence sediment characteristics over large intertidal and subtidal areas. In addition to influencing grain size, anthropogenic inputs may contribute contaminants, including metals, to the environment, which can bind to sediments. Sediment grain size and sediment chemistry trends are useful in characterizing year-to-year differences that may be related to either natural or anthropogenic influences.

Bottom samples for sediment grain size and sediment chemistry analyses are collected at Stations B1 through B6 during the summer surveys (Figure 3.3.1). All samples are collected *in situ* by biologist-divers in conjunction with infauna sampling.

### 3.3.1 Sediment Grain Size

A sample of sediments for grain size analysis is taken from a grab at each station using a 1.4 in (3.5 cm)-diameter, 5.9 in (15 cm)-long plastic core tube. The sample is transferred to a plastic bag for laboratory analysis.

The size distributions of sediment particles are determined using two techniques: laser light diffraction to measure the amount and patterns of light scattered by a particle's surface for the sand/silt/clay fraction, and standard sieving for the gravel fraction. Laboratory data from the two methods are combined and presented in tabular format. Resulting analyses include mean and median grain size, standard deviation of the grain size, sorting, skewness, and kurtosis. Data are plotted as size-distribution curves.

3.3.1.1 Sediment distribution curves and parameters describing sediment grain size characteristics for each station are presented in the report appendices and are summarized in a tabular format. Grain size is expressed in phi (Φ) units, which are inversely related to grain diameter.

3.3.1.2 Sorting is a measure of the spread of the particle distribution curve, with poorly-sorted sediments composed of a broad range of particle size classes, while well-sorted sediments contain fewer size classes. Results of the sorting analysis are presented in tabular format and as sediment distribution curves.

3.1.3 Skewness and kurtosis tell how closely the grain size distribution approaches the normal Gaussian probability curve. More extreme skewness and kurtosis values indicate non-normal distributions. Skewness is a measure of the symmetry of the particle distribution curve; a value of zero indicates a symmetrical distribution of fine and coarse materials around the median of the curve, while a value greater then zero (positive) indicates an excess of fine material, and a negative value indicates an excess of coarse material.

Kurtosis is a measure of the peakedness of the particle distribution curve. A kurtosis value of 1.0 represents a normal particle distribution curve while a value greater than 1.0 indicates a leptokurtic (peaked) distribution with better sorting in the central portion of the curve than in the tails. A value less than 1.0 indicates a platykurtic (flattened) distribution and a lack of dominance by any one size category.

Results for skewness and kurtosis values are presented in a tabular format.

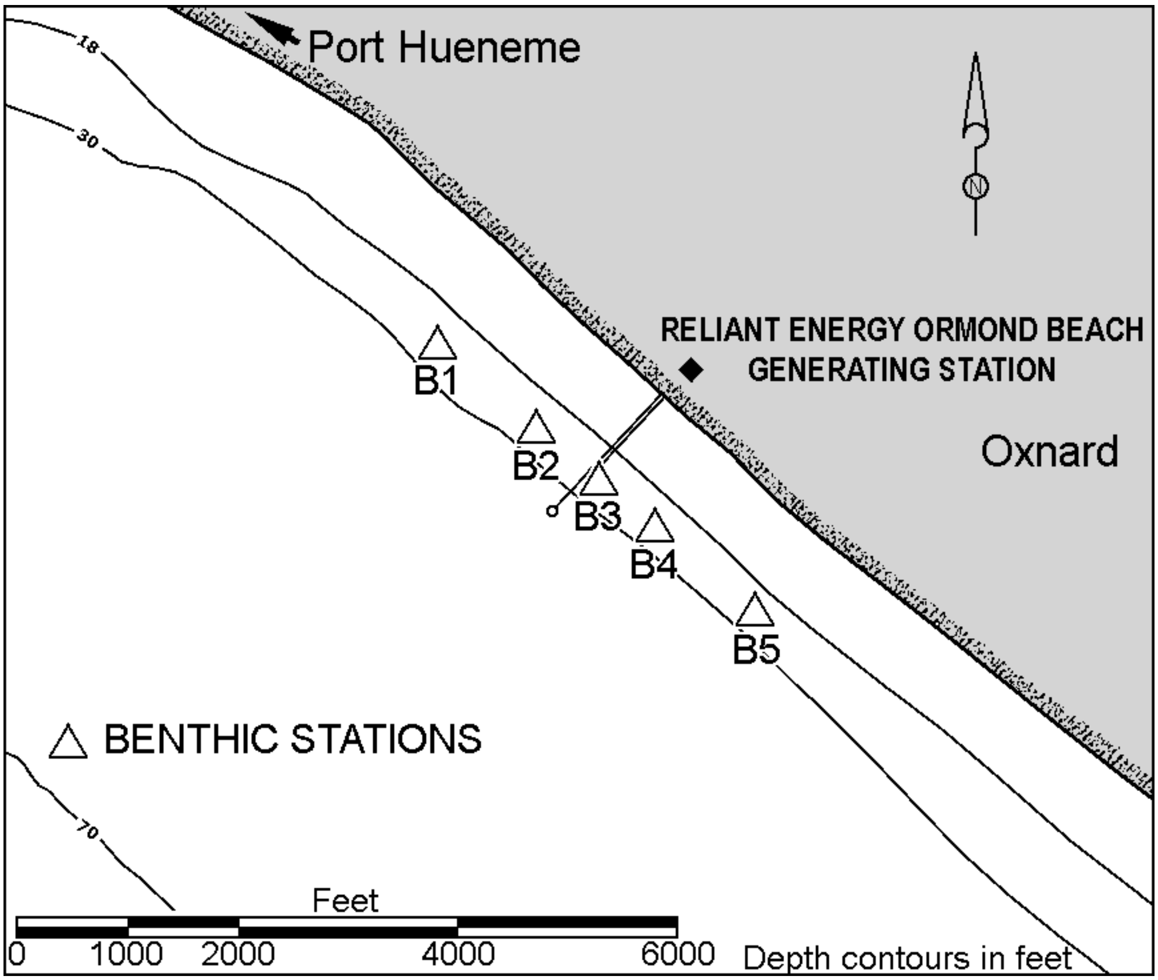


**Figure 3.3.1. Location of the sediment characterization (benthic) sampling stations.**

### 3.3.2 Sediment Chemistry

Samples for sediment chemistry analysis are taken from the upper 0.79 in (2 cm) of the sediments at each station. To ensure that sediments are not contaminated by contact with metal, cleaned glass collection jars are filled with seawater and taken to the sea floor by biologist-divers where sediment samples are collected directly with the jars.

On the surface sediments are kept on ice while in the field, and maintained at approximately 4°C until laboratory procedures begin. Replicate sediment samples are composited by the analytical laboratory prior to analysis and reported as station results. Sediment is analyzed for total percent solids and four metals: chromium, copper, nickel, and zinc. Standard Methods (SM) method 2540 B is used in determining total percent solids, and Environmental Protection Agency (EPA) method 6020 is used for metal analysis.

Sediment samples are collected at the five benthic stations and analyzed for chromium, copper, nickel, and zinc. Values are reported as dry weight. Sediment metal concentrations are presented in the report appendices and summarized in a tabular format.

## SECTION 3.4 MUSSEL BIOACCUMULATION

### 3.4.0 Introduction

Concentrations of many toxic substances in water are often too low or transitory to be reliably detected through the analysis of water samples. Also, many toxic substances are not water-soluble, but are instead associated with sediments or organic tissues. Tissues from aquatic organisms are preferably sampled because they accumulate and concentrate toxic substances to levels which may be hundreds of times the levels found in water samples, thus facilitating the detection of pollutants. Mussels are excellent subjects for this purpose because they 1) are sessile, 2) are long-lived, 3) can be transplanted and maintained in areas were they do not occur, and 4) reliably concentrate toxic pollutants from the water (SWRCB 1995, 2000).

### 3.4.1 California State Mussel Watch Program

The California State Mussel Watch Program (SMWP) monitors levels of metals and organic pollutants in both native California mussels and bay mussels. Bioaccumulation of pollutants by the two species was found to be comparable, although some differences were found between the mussels, likely related to habitat preference (SWRCB 1995, 2000). California mussels are preferentially used for analysis. However, a resident population of mussels is sometimes not available in an area, such as offshore of the Ormond Beach Generating Station discharge. Therefore, mussels are transplanted into the area for at least 90 days. All analytical results are reported on a dry weight basis; however, wet weight concentrations are calculated for comparison with evaluation criteria.

### 3.4.2 Mussel Collection / Deployment

Prior to 2006, mussels for tissue analysis were collected off of the Ormond Beach Generating Station discharge buoy. Replacement of the buoy in early 2006, however, eliminated this site as a mussel source. As a result, live bay mussels (*Mytilus galloprovincialis*) are purchased from a commercial mussel distributor, Carlsbad Aquafarms, for transplant near the Ormond Beach discharge. Donor mussels are harvested from Agua Hedionda Lagoon in Carlsbad, California, cleaned and placed within protective enclosures that allowed unrestricted water flow to the mussels, and transplanted to a mooring established near the Ormond Beach discharge. Additional mussels from the donor site are frozen for later analysis and comparison with the transplanted mussels. The transplanted mussels were retrieved and returned to the laboratory for chemical analysis.

### 3.4.3 Mussel Tissue Analyses

Tissues from the retrieved mussels are composited into a single sample replicate and analyzed for concentrations of the metals chromium, copper, nickel, and zinc according to methods used in the California State Mussel Watch Program (SMWP, and SWRCB 1986). Standard Methods (SM) method 2540B is used in determining total percent solids, and Environmental Protection Agency (EPA) method 6020 is used for metal analysis. The same methods are used with bay mussels collected from the donor site and from a set of California mussels (*Mytilus californianus*) collected from Manhattan Beach Pier in Santa Monica Bay, which served as a reference site.

### 3.4.4 Method Detection Levels

During sample analysis, metals are detectable at very low concentrations. The level below which the analytical method will no longer detect the analyte is referred to as the method detection limit (MDL). However, concentrations are only reported when results can be confirmed by exceeding a confidence level, termed the reporting limit (RL). If metal concentrations are detected at a level below the RL the results can not reliably be reported and sample results are reported as none detected (ND).

**SECTION 3.5 BIOLOGICAL MONITORING**

**3.5.0 Introduction**

The biological monitoring portion of the receiving water monitoring program consists of periodic biological surveys of the area surrounding the discharge. The biological studies include studies of those biological assemblages which may be impacted by the discharge including the benthic infauna and the fish and macroinvertebrates drawn into the station with the cooling water.

**3.5.1 Benthic Infauna**

The benthic infauna, invertebrates that live in the bottom sediments, are an important part of the marine ecosystem. These animals are a major food source for fish and other larger invertebrates, and contribute to nutrient recycling. Some species are highly sensitive to effects of human activities, while others thrive under altered conditions. The assessment of the benthic community is, therefore, a major component of many marine monitoring programs, which document both existing conditions and trends over time.

The benthic infaunal community offshore of the Ormond Beach Generating Station has been sampled as part of the NPDES environmental monitoring program since 1978. Benthic samples were collected in both winter and summer from 1978 to 1988, and only in summer since 1990. Six stations were sampled in all surveys except 1998 (only three stations), 2003 and 2008 (four stations, two replicates each instead of four replicates as in all other surveys). In 2006 the Southern California Benthic Response Index (BRI) was added to the infaunal analysis to provide a scientifically valid criterion or threshold that can be used to distinguish “healthy” and “unhealthy” benthic communities (Smith et al. 2003).

3.5.1.1 Benthic Infauna Collection and Analyses

Biologist-divers collect sediment cores for analysis of infaunal composition at Stations B1 through B6 (Figure 3.5.1). Four replicate cores are collected at each station using a hand-held, diver-operated box corer which collects a uniform sample of 15.5 $in^2$ (100.0 $cm^2$ ) surface area to a depth of 3.9 in (10.0 cm), for a total sample volume of 1.97 quart (qt) (1.0 liter (l)). The box corer is pushed into the sediment and a closing blade is swung across the mouth of the box. The core is then withdrawn from the sediment and sealed by a neoprene cover for transport to the surface. Samples are washed in the field on a 0.02 in (0.5 mm) mesh stainless-steel screen, labeled, and fixed in buffered 10% formalin-seawater.

In the laboratory, samples are transferred to 70% isopropyl alcohol, sorted to major taxonomic groups, identified to the lowest practical taxonomic level, and counted. Identifications and nomenclature follows the usage accepted by the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT Edition 5, 2008).

Representative specimens are added to MBC's reference collection. Following identification, the weight of organisms in major taxonomic groups is obtained for each replicate. Specimens are placed on small, pre-weighed mesh screens that have been immersed in 70% isopropyl alcohol, blotted on a paper towel, and air-dried for five minutes. Large organisms are weighed separately. Data are presented by station and replicate in the report appendices.

3.5.1.2 Benthic Infauna Results

The results of the benthic infauna analyses are reported for the following:

- Species Composition
- Abundance
- Species Richness
- Species Diversity
- Benthic Response index
- Biomass
- Community Composition
- Cluster Analyses

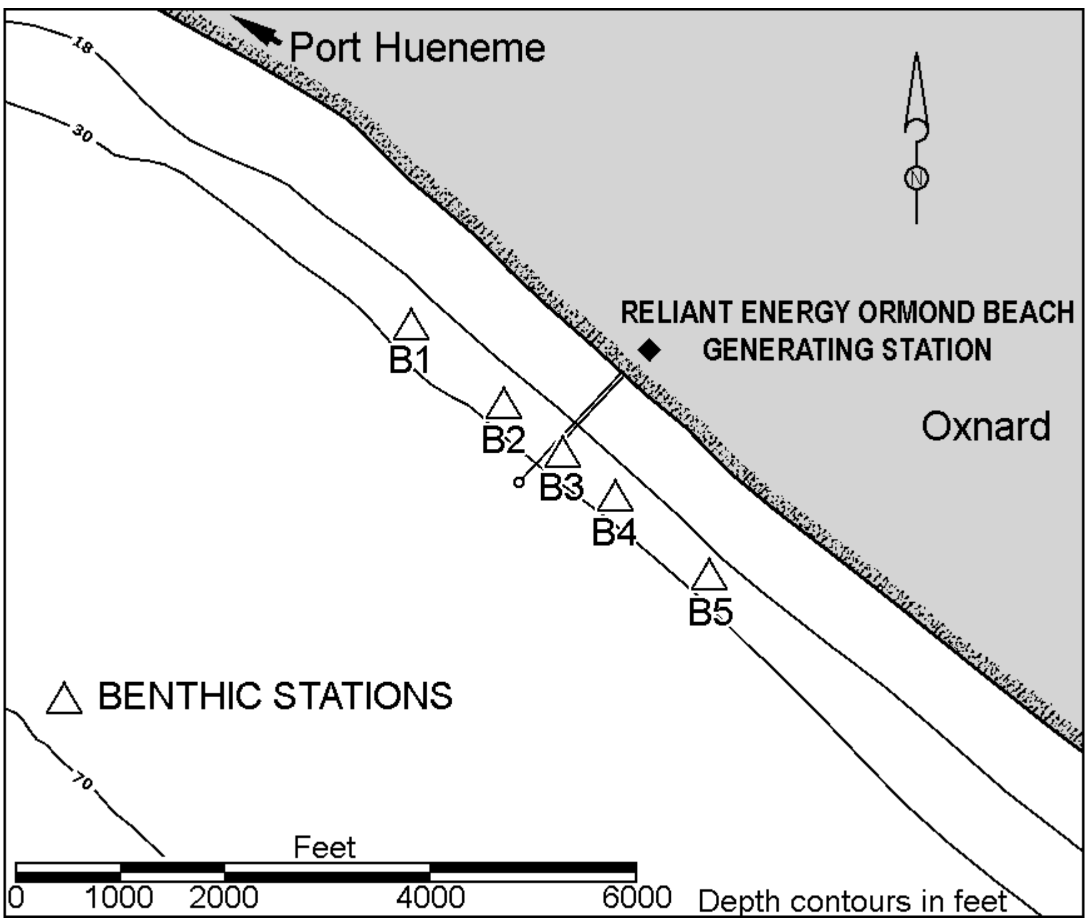


**Figure 3.5.1. Location of the benthic sampling stations.**

### 3.5.2 Fish Impingement

Ormond Beach Generating Station is located approximately 2.3 mi (3.7 km) southeast of the entrance to Port Hueneme in Ventura County, California. Seawater is supplied to the once-through cooling system (OTC) through a submerged, velocity-capped intake structure. The intake structure is located 2098 ft (640 m) offshore at a depth of -32.8 ft (-10 m) Mean Low Lower Water (MLLW). The intake point is 6.6 ft (2 m) above the bottom. Seawater is drawn into the cooling system and screened for debris, first by bar racks that remove large debris followed by mesh traveling screens that remove the remaining material too large to pass through the heat exchange condensers. Impinged material caught on the screens, including fish and macroinvertebrates, is washed off the screens into collection baskets.

Fish impingement is currently monitored by Proteus Sea Farms International, Inc., Ojai, California during normal operations of the cooling water system. Normal operation refers to the daily operational mode of the cooling water system. A summary report compiles these observations and subsequent analysis over the monitoring period to determine the interaction between the operation of the cooling water system and the general assemblage and stability of the source water community.

3.5.2.1 Normal Operation

Normal operation surveys are performed to assess the impingement of organisms during periods of normal operations at the generating station, 24-hr surveys are conducted during representative periods of operation. During such surveys, the traveling screens and trash baskets are cleared of all accumulated debris at the start of the sampling period. At the end of the 24-hour period all accumulated material is processed with up to 50 individuals of each fish species are measured to the nearest millimeter (mm) standard length (SL) or other appropriate length (disc width [DW] or total length [TL]), and aggregate biomass (kg) is recorded for all measured and unmeasured individuals. Total abundance for species with greater than 50 individuals is estimated by dividing the total weight of the unmeasured individuals by the mean weight of the measured individuals of that species.

Due to variation in daily operating patterns, all normal operation survey fish and macroinvertebrate data is standardized to circulated water flow rates to determine the rate of impingement by the following equation: Impingement Rate = Value/Circulated Water Volume in million gallons. Volume of water circulated is based on the water flow rate during the period surveyed. Monthly estimated impingement represents the impingement rate multiplied by an analysis flow representing the sampling frequency. The estimated annual impinged abundance represents the summation of each estimated monthly abundance. Biomass is calculated as is described for abundance.

Data is recorded in the field on preprinted data sheets by Proteus Sea Farms. Field sheets are provided to MBC for transcription into digital format. Data are uploaded to the MBC fish impingement long-term database. Length frequency distributions for those fishes examined are derived by rounding (1 to 4 = 0, 5 to 9 = 10) the recorded length to the nearest ten millimeters for each measurement type (SL, TL, or DW). Abundance per size class is plotted using MS Excel. Data from both survey types are utilized for length frequency analysis.

3.5.2.2 Heat Treatments

During heat treatments, accumulated material is sorted and processed. Fish and macro-invertebrates are identified to the lowest practical taxonomic level. Up to 50 individuals of each fish species are measured to the nearest millimeter (mm) standard length (SL) or other appropriate length (disc width [DW] or total length [TL]), and aggregate biomass (kg) is recorded for all measured and unmeasured individuals. Total abundance for species with greater than 50 individuals is estimated by dividing the total weight of the unmeasured individuals by the mean weight of the measured individuals of that species.

Macroinvertebrates are also sorted to the lowest possible taxonomic category, counted and an aggregate weight taken. California spiny lobster (*Panulirus interruptus*) are counted, carapace length (CL) measured to the nearest millimeter, and an aggregate weight recorded.

# APPENDIX A

**Appendix A -1. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for quarterly bacteria sampling (February, May, August, and November) subcontracted to Calscience Environmental Laboratories.**

RRI ENERGY
ORMOND BEACH GENERATING STATION
SAMPLE ANALYSIS REQUEST - CHAIN OF CUSTODY
6635 SOUTH EDISON DRIVE
OXNARD, CA 93033
805) 986-7201
Fax 805) 986-7245

TO: Cal Science Environmental Laboratories Inc
7440 Lincoln Way
Garden Grove, CA 92841-1432
714) 895-5494
Fax 714) 894-7501

| TAG # | DATE | SAMPLE NUMBER | SAMPLE TIME | COMP | GRAB | SEA WATER | SOIL | SLUDGE | OTHER | CONTAINER TYPE | TOTAL AND FECAL COLIFORMS | ENTEROCOCCUS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- OUTFALL- 090710- 01- TF COLIFORMS | 8:10 | | X | X | | | | P | X | |
| 2 | 10-Jul-09 | OB- INTAKE- 090710- 01- TF COLIFORMS | 8:30 | | X | X | | | | P | X | |
| 3 | 10-Jul-09 | OB- OUTFALL- 090710- 01- ENTEROCOCCUS | 8:10 | | X | X | | | | P | | X |
| 4 | 10-Jul-09 | OB- INTAKE- 090710- 01- ENTEROCOCCUS | 8:30 | | X | X | | | | P | | X |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| | |
|---|---|
| Client Project Name: | RRI ENERGY, ORMOND BEACH GENERATING STATION NPDES 08207A |
| Project Contact: | Michael Mancuso |

MBC applied Environmental Science
3000 Redhill Ave.
Costa Mesa CA 92626
714) 850-4830
Fax 714) 850-4840

| | | |
|---|---|---|
| Special Requirements: | XX | RWQCB REPORTING |
| Special Instructions: | Sub-Contract to Silliker Labs | MPN/100 ml reporting level |

| HANDLING | | | | | |
|---|---|---|---|---|---|
| 24 HOURS | | 5 DAYS | | DISPOSE OF SAMPLE | |
| 48 HOURS | | STANDARD | X | X | |
| 72 HOURS | | OTHER | | | |

The undersigned hereby acknowledges having received a copy of the fee schedule/general information and conditions, the provisions of which are part of this agreement.

| RELINQUISHED BY OBGS (name & signature): | DATE | TIME | RECEIVED BY CAPCO LAB (name & signature): |
|---|---|---|---|
| Adolfo Melchor | 10-Jul-09 | | |
| **RELINQUISHED BY (name & signature):** | **DATE** | **TIME** | **RECEIVED BY (name & signature):** |
| | | | |

**Appendix A -2. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for quarterly sampling subcontracted to MBC Applied Environmental Sciences.**

TO: **MBC Applied Environmental Sciences**
**3000 Redhill Avenue**
**Costa Mesa CA 92626**
**714) 850-4830**
**Fax 714) 850-4840**

| TAG # | DATE | SAMPLE NUMBER | SAMPLE TIME | COMP | GRAB | WATER | SOIL | CONTAINER TYPE | EPA/600/R-95/136 - Chronic Tests | Giant Kelp (*Macrocystis pyrifera* ) | Abalone (*Haliotis rufescens* ) | Topsmelt (*Atherinops affinis* ) | EPA/821/R-02/012 - Acute Test May Only (*Atherinops affinis* ) | DILUTION WATER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- OUTFALL- 090710- 01- TOXICITY | 8:10 | | X | X | | P | | X | | | | |
| 2 | 10-Jul-09 | OB- INTAKE- 090710- 01- DILUTION WATER | 8:30 | | X | X | | P | | | | | | X |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |

Comments:

**For additional information contact Adolfo Melchor at 805) 832-3843**

amelchor@RRI.com

| HANDLING | | | | | |
|---|---|---|---|---|---|
| 24 HOURS | | 5 DAYS | | DISPOSE OF SAMPLE | LAB STAMP |
| 48 HOURS | | **STANDARD** | **X** | **X** | |
| 72 HOURS | | OTHER | | | |

The undersigned hereby acknowledges having received a copy of the fee schedule/general information and conditions, the provisions of which are part of this agreement.

| RELINQUISHED BY OBGS (name & signature): | DATE | TIME | RECEIVED BY MBC Lab (name & signature): |
|---|---|---|---|
| Adolfo Melchor | 10-Jul-09 | | |
| **RELINQUISHED BY (name & signature):** | **DATE** | **TIME** | **RECEIVED BY (name & signature):** |
| | | | |

**Appendix A -3. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for semi-annual sampling (November) subcontracted to Calscience Environmental Laboratories.**

**RELIANT ENERGY**
**ORMOND BEACH GENERATING STATION**
**SAMPLE ANALYSIS REQUEST - CHAIN OF CUSTODY**
**6635 SOUTH EDISON DRIVE**
**OXNARD, CA 93033**
**805) 986-7201**
**Fax 805) 986-7245**

**TO:**
**Cal Science Environmental Laboratories Inc**
**7440 Lincoln Way**
**Garden Grove, CA 92841-1432**
**714) 895-5494**
**Fax 714) 894-7501**

| TAG # | DATE | SAMPLE NUMBER | SAMPLE TIME | COMP | GRAB | SEA WATER | SOIL | SLUDGE | OTHER | CONTAINER TYPE | PP Metals (EPA 6010b/7471A) | Hexavalent Chromium (PA 7196A) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- OUTFALL- 090710- 01- PP METALS | 8:00 | | X | X | | | | P | X | | |
| 2 | 10-Jul-09 | OB- INTAKE- 090710- 01- PP METALS | 7:45 | | X | X | | | | P | X | | |
| 3 | 10-Jul-09 | OB- OUTFALL- 090710- 01- Hexavalent Chrome | 8:00 | | X | X | | | | P | | X | |
| 4 | 10-Jul-09 | OB- INTAKE- 090710- 01- Hexavalent Chrome | 7:45 | | X | X | | | | P | | X | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| | |
|---|---|
| Client Project Name: | **RELIANT ENERGY, ORMOND BEACH GENERATING STATION NPDES 08207A** |
| Project Contact: | **Michael Mancuso** |

**MBC applied Environmental Science**
**3000 Redhill Ave.**
**Costa Mesa CA 92626**
**714) 850-4830**
**Fax 714) 850-4840**

| | | |
|---|---|---|
| Special Requirements: | XX | RWQCB REPORTING |
| Special Instructions: | Please report in µg/L | |

| TURN AROUND TIME | | | | | DISPOSE OF SAMPLE | |
|---|---|---|---|---|---|---|
| | SAME DAY | | 72 HOUR | | | |
| | 24 HOUR | | 5 DAYS | | X | |
| | 48 HOUR | | 10 DAYS | X | | LAB STAMP |

The undersigned hereby acknowledges having received a copy of the fee schedule/general information and conditions, the provisions of which are part of this agreement.

| RELINQUISHED BY OBGS (name & signature): | DATE | TIME | RECEIVED BY MBC Lab (name & signature): |
|---|---|---|---|
| A. MELCHOR | 10-Jul-09 | | |
| RELINQUISHED BY (name & signature): | DATE | TIME | RECEIVED BY (name & signature): |
| | | | |
| RELINQUISHED BY (name & signature): | DATE | TIME | RECEIVED BY (name & signature): |
| | | | |

**Appendix A -4. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for annual Discharge (001) sampling (May) subcontracted to Calscience Environmental Laboratories.**

# RRI ENERGY
# ORMOND BEACH GENERATING STATION
# SAMPLE ANALYSIS REQUEST & CHAIN OF CUSTODY

**6635 So. Edison Dr., Oxnard Ca. 93033**
**805) 986-7291 FAX 805) 986-7241**

**TO:** CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY
GARDEN GROVE, CA 9284101427
714) 895-5494 FAX 714) 894-7501

| | SAMPLE DATE | SAMPLE NUMBER | SAMPLE TIME | GRAB | WATER | CONTAINER TYPE | Metals (priority pollutants) | HEX Chromium (EPA 7199) | VOC (EPA 8260B) | S VOC (EPA 8270C) | Phenols (EPA 420.1) | Total Cyanide (EPA 335.2) | Pest/PCB'S (EPA 8081A /8082) | Dioxin (EPA 8290) | Nitrates (EPA 335.2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- 001- 090710- 01- METALS | 8:10 | X | X | P | X | | | | | | | | |
| 2 | 10-Jul-09 | OB- 001- 090710- 01- HEXACHR-NITRATE | 8:10 | X | X | P | | X | | | | | | | X |
| 3 | 10-Jul-09 | OB- 001- 090710- 01- VOC | 8:10 | X | X | AG | | | X | | | | | | |
| 4 | 10-Jul-09 | OB- 001- 090710- 02- VOC | 8:10 | X | X | AG | | | X | | | | | | |
| 5 | 10-Jul-09 | OB- 001- 090710- 03- VOC | 8:10 | X | X | AG | | | X | | | | | | |
| 6 | 10-Jul-09 | OB- 001- 090710- 01- SVOC | 8:10 | X | X | AG | | | | X | | | | | |
| 7 | 10-Jul-09 | OB- 001- 090710- 01- PHENOLS | 8:10 | X | X | AG | | | | | X | | | | |
| 8 | 10-Jul-09 | OB- 001- 090710- 01- CYANIDE | 8:10 | X | X | P | | | | | | X | | | |
| 9 | 10-Jul-09 | OB- 001- 090710- 01- PESTICIDES | 8:10 | X | X | AG | | | | | | | X | | |
| 10 | 10-Jul-09 | OB- 001- 090710- 01- PCBS | 8:10 | X | X | AG | | | | | | | X | | |
| 11 | 10-Jul-09 | OB- 001- 090710- 01- DIOXIN | 8:10 | X | X | AG | | | | | | | | X | |
| 12 | 10-Jul-09 | OB- 001- 090710- 02- DIOXIN | 8:10 | X | X | AG | | | | | | | | X | |
| 13 | 10-Jul-09 | OB- 001- 090710- 01- NH3-N2 | 8:10 | X | X | AG | | | | | | | | | X |

For additional information contact:
Ormond Beach Generating Station, Adolfo Melchor 805) 832-3843
MBC Applied Environmental Services, Mike Mancuso 714) 850-4830 FAX 850-4840

| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
|---|---|---|---|
| Adolfo Melchor | | 10-Jul-09 | |
| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
| | | | |

**Appendix A -5. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for annual Intake (002) sampling (May) subcontracted to Calscience Environmental Laboratories.**

# RRI ENERGY
# ORMOND BEACH GENERATING STATION
# SAMPLE ANALYSIS REQUEST & CHAIN OF CUSTODY

**6635 So. Edison Dr., Oxnard Ca. 93033**
**805) 986-7291 FAX 805) 986-7241**

**TO:** CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY
GARDEN GROVE, CA 9284101427
714) 895-5494 FAX 714) 894-7501

| | SAMPLE DATE | SAMPLE NUMBER | | | | SAMPLE TIME | GRAB | WATER | CONTAINER TYPE | Metals (priority pollutants) | HEX Chromium (EPA 7199) | VOC (EPA 8260B) | S VOC (EPA 8270C) | Phenols (EPA 420.1) | Total Cyanide (EPA 335.2) | Pest/PCB'S (EPA 8081A /8082) | Dioxin (EPA 8290) | Nitrates (EPA 335.2) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- 002- | 090710- | 01- METALS | | 8:30 | X | X | P | X | | | | | | | | | | | | | | |
| 2 | 10-Jul-09 | OB- 002- | 090710- | 01- HEXACHR | | 8:30 | X | X | P | | X | | | | | | | X | | | | | | |

For additional information contact:
Ormond Beach Generating Station, Adolfo Melchor 805) 832-3843
MBC Applied Environmental Services, Mike Mancuso 714) 850-4830 FAX 850-4840

| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
|---|---|---|---|
| Adolfo Melchor | | 10-Jul-09 | |
| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
| | | | |

**Appendix A -6. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for annual Low Volume Waste sampling (May) subcontracted to Calscience Environmental Laboratories.**

# RRI ENERGY
# ORMOND BEACH GENERATING STATION
# SAMPLE ANALYSIS REQUEST & CHAIN OF CUSTODY

**6635 So. Edison Dr., Oxnard Ca. 93033**
**805) 986-7291 FAX 805) 986-7241**

**TO:** CALSCIENCE ENVIRONMENTAL LAB
7440 LINCOLN WAY
GARDEN GROVE, CA 9284101427
714) 895-5494 FAX 714) 894-7501

| | SAMPLE DATE | SAMPLE NUMBER | | | | SAMPLE TIME | GRAB | WATER | CONTAINER TYPE | Metals (priority pollutants) | HEX Chromium (EPA 7199) | VOC (EPA 8260B) | S VOC (EPA 8270C) | Phenols (EPA 420.1) | Total Cyanide (EPA 335.2) | Pest/PCB'S (EPA 8081A /8082) | Dioxin (EPA 8290) | Radiactivity (EPA 9310/SM7-3) | Nitrates (EPA 335.2) | Ammonia (EPA 350.2) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- | RB- | 090710- | 01- METALS | 8:00 | X | X | P | X | | | | | | | | | | | | | | |
| 2 | 10-Jul-09 | OB- | RB- | 090710- | 01- HEXAVALCHROM | 8:00 | X | X | P | | X | | | | | | | | | | | | | |
| 3 | 10-Jul-09 | OB- | RB- | 090710- | 01- VOC | 8:00 | X | X | AG | | | X | | | | | | | | | | | | |
| 4 | 10-Jul-09 | OB- | RB- | 090710- | 02- VOC | 8:00 | X | X | AG | | | X | | | | | | | | | | | | |
| 5 | 10-Jul-09 | OB- | RB- | 090710- | 03- VOC | 8:00 | X | X | AG | | | X | | | | | | | | | | | | |
| 6 | 10-Jul-09 | OB- | RB- | 090710- | 01- SVOC | 8:00 | X | X | AG | | | | X | | | | | | | | | | | |
| 7 | 10-Jul-09 | OB- | RB- | 090710- | 01- PHENOLS | 8:00 | X | X | AG | | | | | X | | | | | | | | | | |
| 8 | 10-Jul-09 | OB- | RB- | 090710- | 01- CYANIDE | 8:00 | X | X | P | | | | | | X | | | | | | | | | |
| 9 | 10-Jul-09 | OB- | RB- | 090710- | 01- PESTICIDES | 8:00 | X | X | AG | | | | | | | X | | | | | | | | |
| 10 | 10-Jul-09 | OB- | RB- | 090710- | 01- PCBS | 8:00 | X | X | AG | | | | | | | X | | | | | | | | |
| 11 | 10-Jul-09 | OB- | RB- | 090710- | 01- DIOXIN | 8:00 | X | X | AG | | | | | | | | X | | | | | | | |
| 12 | 10-Jul-09 | OB- | RB- | 090710- | 02- DIOXIN | 8:00 | X | X | AG | | | | | | | | X | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | | | |
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| 19 | | | | | | | | | | | | | | | | | | | | | | | | |
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| 24 | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | |

For additional information contact:
Ormond Beach Generating Station, Adolfo Melchor 805) 832-3843
MBC Applied Environmental Services, Mike Mancuso 714) 850-4830 FAX 850-4840

| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
|---|---|---|---|
| Adolfo Melchor | | 10-Jul-09 | |
| RELINQUISHED BY (Name & Signature) | TIME | DATE | RECEIVED BY: (Name & signature) |
| | | | |

**Appendix A -7. Example of Ormond Beach Generating Station Sample Analysis Request / Chain-of-Custody for stormwater sampling subcontracted to CAPCO Analytical Services.**

RRI ENERGY
ORMOND BEACH GENERATING STATION
SAMPLE ANALYSIS REQUEST - CHAIN OF CUSTODY
6635 SOUTH EDISON DRIVE
OXNARD, CA 93033
805) 986-7201
Fax 805) 986-7245

TO: CAPCO Analytical Services
1538 Eastman Ave.
Ventura, Ca. 93993
805) 644-1095

| TAG # | SAMPLE DATE | SAMPLE NUMBER | | | | | SAMPLE TIME | COMP | GRAB | WATER | SOIL | SLUDGE | OTHER | CONTAINER TYPE | OIL & GREASE | TOTAL SUSPENDED SOLIDS | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-Jul-09 | OB- | SRB- | 090710- | 01- | O & G | 8:00 | | X | X | | | | AG | X | | |
| 2 | 10-Jul-09 | OB- | SRB- | 090710- | 01- | TSS | 8:00 | | X | X | | | | P | | X | |
| 3 | 10-Jul-09 | OB- | SRB- | 090710- | 01- | pH | 8:00 | | X | X | | | | P | | | X |

Comments:

**For additional information contact Adolfo Melchor at 805) 832-3843**

amelchor@RRI.com

| HANDLING | | | | | | |
|---|---|---|---|---|---|---|
| 24 HOURS | | 5 DAYS | | DISPOSE OF SAMPLE | | |
| 48 HOURS | | STANDARD | X | X | | |
| 72 HOURS | | OTHER | | | | CAPCO Sample Number |

The undersigned hereby acknowledges having received a copy of the fee schedule/general information and conditions, the provisions of which are part of this agreement.

| RELINQUISHED BY OBGS (name & signature): | DATE | TIME | RECEIVED BY CAPCO LAB (name & signature): |
|---|---|---|---|
| Marfty Molina | 10-Jul-09 | | |
| RELINQUISHED BY (name & signature): | DATE | TIME | RECEIVED BY (name & signature): |
| | | | |