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January 6, 2005
BES Project No.: 02-1068.02

Mr. Lorenzo Bracy
JMB Realty Corporation
900 N. Michigan Avenue, 14th Floor
Chicago, IL 60611-1575

Subject: **Semi-Annual Groundwater Monitoring Report, July through December 2004**
Former Lihue Power Plant
2940 Haleko Road
Lihue, Kauai, Hawaii 96766

Dear Mr. Bracy:

BEI Environmental Services has prepared the enclosed report on behalf of LPC Corporation for the subject site. If you have any questions or comments, do not hesitate to contact me at (808) 535-6040.

Sincerely,

BEI ENVIRONMENTAL SERVICES

Stephanie Mandina
Environmental Scientist II

Enclosure: Semi-Annual Groundwater Monitoring Report (1 original)

cc (with enclosure):
Ms. Liz Galves, HDOH HEER Section (1 copy)

SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JULY THROUGH DECEMBER 2004

Former Lihue Power Plant
2940 Haleko Road
Lihue, Kauai, Hawaii 96766

HDOH Release I.D.s:
20010223-1409
20011101-0935

Latitude: 21° 58' 40" North
Longitude: 157° 22' 30" West

BES Project No.: 02-1068.02

Prepared For:
LPC Corporation
900 N. Michigan Avenue, 14th Floor
Chicago, IL 60611-1575

Prepared By:
BEI Environmental Services
311 Pacific Street
Honolulu, Hawaii 96817
808-535-6055

January 6, 2005

Prepared for:

LPC Corporation
900 N. Michigan Avenue, 14th Floor
Chicago, IL 60611-1575

SEMI-ANNUAL GROUNDWATER MONITORING REPORT, JULY THROUGH DECEMBER 2004
FORMER LIHUE POWER PLANT
2940 HALEKO ROAD
LIHUE, KAUAI, HAWAII 96766

HDOH Release I.D.s:
20010223-1409
20011101-0935

BES Project No.: 02-1068.02

Prepared By:

Stephanie Mandina
Environmental Scientist II

James T. Hayes
Director of Operations

BEI Environmental Services
311 Pacific Street
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January 6, 2005

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1.0 INTRODUCTION

BEI Environmental Services (BES) has prepared this Semi-Annual Groundwater Monitoring Report on behalf of LPC Corporation for submittal to the State of Hawaii Department of Health (HDOH). This report details groundwater gauging and sampling activities, and passive free product recovery skimmer servicing conducted at the former Lihue Power Plant, henceforth the "Site," in Lihue, Kauai during the period July 1 through December 31, 2004 (Figure 1). All activities were performed in accordance with the recommendations and initial release response activities described in BES' *Diesel Spill Response, Well Installation, Product Recovery, and Groundwater Monitoring Report* prepared in August 2002 (BES, 2002).

Section 2.0 of this report presents background information, Section 3.0 presents the methods used by BES to complete the project, Section 4.0 summarizes groundwater sampling results and findings, and Section 5.0 presents our conclusions and discussion.

2.0 SITE DESCRIPTION

2.1 General

The Site is approximately 700 feet south of Kaumualii Highway, also known as Highway 50 (Hwy 50), near the Rice Street intersection. The Site is located approximately 150 feet above mean sea level (aMSL). The closest body of water is Nawiliwili Stream, which is approximately 500 feet to the north of the spill site, and empties into the Pacific Ocean at Nawiliwili Harbor. The spill site area consists of approximately 16,800 square feet (sf) (0.39 acres). Prominent structures or features at the Site include the former power plant cooling towers, carpentry shops, transfer pumps and secondary spill containment, former 5,000-gallon used oil underground storage tank (UST), and access roads (Figure 2).

The Site is in the Nawiliwili Stream valley and is lower in elevation than the surrounding area (Figure 1). Immediately to the west of the spill site is an upslope, but the Site is otherwise generally level. There are four above ground storage tanks (ASTs) located to the north of the spill site and on top of the slope. Aside from the power plant and former sugar mill-oriented buildings and shops (Figure 2), there are no other businesses or establishments in the immediate vicinity. Features of the spill site, including the adjacent former UST location, ASTs on the hillside at the west side of the Site, and product piping are also illustrated in Figure 2.

A former soil management unit (SMU) area consists of approximately 5,500 sf (0.12 acres) and is located along the north side of the former sugar mill facility, near Nawiliwili Stream. Notable features of the surrounding area include the elevated conveyor systems and the "B" Mill Building (Figure 2).

2.2 Background

There were several events that contributed to the monitoring and remediation activities at the Site. These events include the following:

- 5,000 Gallon Used Oil Underground Storage Tank Closure
- Diesel Spill, July 2001
- Diesel Spill, October 2001

These events were discussed in detail in the previous *Semi-Annual Groundwater Monitoring Report, July through December 2003* (BES, 2004). A brief summary of these events is provided below.

In February 2001, BES performed the closure of a 5,000-gallon used oil UST at the Site. Although there was no observable indication of a release, closure soil samples contained detectible concentrations of petroleum; however, release response analyses contained no detectible concentration exceeding HDOH Tier 1 Soil Action Levels (SALs). Based on this, BES recommended that no further action was required related to the former waste oil UST.

In July 2001, a diesel spill occurred at the transfer pump station and secondary containment system during offloading of fuel to the Site hillside AST. BES performed immediate release response activities. Impacted soil was excavated and placed in an onsite SMU where it was successfully remediated. Observation/recovery trenches were excavated in order to assess the extent of petroleum impact in the subsurface. Petroleum product was pumped and skimmed from the groundwater.

In October 2001, a second diesel spill occurred in the same location as the July 2001 spill. Groundwater was again impacted and petroleum product was skimmed from the surface of the groundwater.

BES prepared and submitted Written Follow-up Notification forms to HDOH regarding both spills.

Following these three incidents, BES compiled and submitted a *Diesel Spill Response Well Installation, Product Recovery, & Monitoring Work Plan* (BES, 2002) to HDOH. The Work Plan called for the installation of both groundwater monitoring and recovery wells for diesel recovery using both pumping and passive skimmers. The Work Plan was approved by HDOH and this report documents the continued implementation of the work plan.

3.0 METHODS

For the period from July 1 through December 31, 2004, BES: 1) periodically emptied and serviced the passive product recovery skimmer in recovery well RW-4; 2) periodically gauged all wells; and 3) collected groundwater samples from recovery wells RW-1, RW-3, and RW-4 on December 8, 2004. This section outlines the methods used by BES during these activities.

3.1 Periodic Service and Gauging

BES checked and serviced the passive product recovery skimmer during Site visits on August 27, November 5, and December 8, 2004. BES gauged all recovery and monitoring wells on these days to check for the presence of diesel and to measure groundwater elevations for calculating groundwater gradient direction and magnitude; however, during the Site visit on November 5, 2004, wells MW-1, MW-2, MW-4, RW-1, and RW-2 were not gauged because these wells were inaccessible due to heavy rainfall and mud. The results of these activities are presented in Section 4.0.

3.1.1 Product Passive Skimmer Servicing

As recommended by BES in the previous *Semi-Annual Groundwater Monitoring Report, January through June 2004* (BES, 2004), the passive product recovery skimmer maintained in recovery well RW-1 was removed during the August 27, 2004 Site visit because it was no longer collecting residual diesel product.

Servicing of the passive skimmer in recovery well RW-4 included the removal of the skimmer from the well and removing any product recovered in it and changing of the absorbent pads on the custom-built passive skimmer. To remove the skimmer, the recovery well was uncovered and the well cap to which the skimmer was secured was lifted off the well casing, and the passive product recovery skimmer was slowly pulled out of the well. The skimmer was then inspected for the presence of diesel product. If the absorbent pads on the custom-built passive skimmer were at least partially saturated with diesel product, the pads were removed and disposed of in a 15-gallon, DOT-approved drum and clean absorbent pads were attached to the skimmer. Section 4.1 presents the findings during the passive product skimmer servicing events.

3.1.2 Groundwater Gauging

Groundwater/product levels were measured in the four groundwater monitoring and four recovery wells immediately after skimmer removal and servicing using a Solinst model 122 electronic interphase probe. The probe was decontaminated per the hand wash procedure described in BES' standard operating procedure (SOP) #1 between use in each well (Appendix A). Following gauging, the passive product recovery skimmer was re-inserted in recovery well RW-4 and the caps and well covers were secured. Results of the groundwater gauging activities are discussed in Sections 4.2 and 4.3.

3.2 Groundwater Monitoring Activities

On December 8, 2004, groundwater samples were collected from recovery wells RW-1, RW-3, and RW-4 (Figure 4). Groundwater samples were not collected from wells MW-1, MW-2, MW-3, MW-4, and RW-2 because no petroleum analytes have ever been detected in them at concentrations exceeding HDOH Tier 1 action levels (a monitoring period of at least 2.5 years). Field observations and laboratory results of the groundwater monitoring event are presented in Section 4.0.

3.2.1 Field Methods

Following gauging, the wells were purged of free-standing water and groundwater samples were collected. BES' SOP #3 used for performing groundwater sampling is included in Appendix A. Copies of the groundwater sample collection data sheets are provided in Appendix B.

A Whale model 921 submersible pump with dedicated tubing was used to purge the wells and to collect the groundwater sample at the completion of purging. Purged groundwater was placed in 55-gallon drums for future offsite disposal. Groundwater parameters (pH, temperature, and conductivity) were measured using a YSI model 63 water meter. Groundwater samples slated for lead analysis were filtered in the field using a disposable 0.45-micron filter prior to being placed in the appropriate sample containers. The groundwater samples were identified with a BES project number (02-1068.02) and well identification number. The sample identifications for their respective wells were as follows:

Well ID	Sample ID
RW-1	02-1068.02-RW-1
RW-3	02-1068.02-RW-3
RW-4	02-1068.02-RW-4

A duplicate groundwater sample was collected from recovery well RW-4 and submitted as sample number 02-1068.02-D.

The samples were sealed, labeled, and stored in a cooler containing water ice in the field. Prior to flying to Oahu, the wet ice was removed. Upon arrival in Oahu, the samples were stored overnight in a cooler containing water ice and were hand-delivered the following morning to Advanced Analytical Laboratory, LLC (AAL), located in Honolulu, Oahu, Hawaii.

3.2.2 Laboratory Analysis Methods

The three primary groundwater samples and one duplicate groundwater sample were analyzed by AAL for the following:

- total petroleum hydrocarbons as diesel (TPH-D) using EPA Method 8015-Modified;
- benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8021b;

- the four HDOH-regulated polynuclear aromatic hydrocarbons (PAHs) acenaphthene, benzo(a)pyrene, fluoranthene, and naphthalene using EPA Method 8100; and
- dissolved lead using EPA Method 7010.

A copy of the laboratory report and chain-of-custody is included in Appendix C. The laboratory results are summarized in Table 4 and discussed in Section 4.4.

4.0 FIELD AND LABORATORY RESULTS

This section summarizes the observations during the passive product skimmer servicing and groundwater sampling event, and the results of the groundwater samples submitted for laboratory analysis.

4.1 Passive Product Skimmer Recovery

During each of the three skimmer servicing events during this six-month period, only trace amounts (1 ounce or less) of diesel product were recovered from well RW-4. During each servicing event, the absorbent pad on the exterior of the skimmer in well RW-4 was observed to be partially saturated with water and product. The product appeared as a light brown and gray stain on the absorbent pad. When the absorbent pads were removed, small accumulations of product were observed; however, no liquid product was observed in the body of the skimmer.

Based on recovery from well RW-4, only trace amounts of product were recovered this reporting period (Table 1).

4.2 Groundwater Gauging Results

There was no measurable diesel product layer detected in any of the four monitoring wells (wells MW-1 through MW-4) or recovery wells (wells RW-1 through RW-4) during any of the three gauging events in this reporting period. During groundwater sampling, a partial sheen was evident on the groundwater purged from recovery wells RW-1 and RW-4. No sheen was evident on water purged from well RW-3.

Groundwater elevations varied by approximately three feet in some locations between the three gauging events in this reporting period. There was heavy rainfall during the November 5, 2004 gauging event, which caused the groundwater elevations to be higher than normal. Between the August 27 and December 8, 2004 gauging events, the groundwater elevations varied by approximately two feet in some locations. During the December 8, 2004 groundwater monitoring event, the depth to groundwater in the wells ranged from 11.79 to 16.12 feet below the top of well casings and the elevation of groundwater ranged from 136.58 to 142.98 feet above Site datum. Groundwater gauging data for December 8, 2004 are presented in Table 2 and current and historical gauging results are presented in Table 3.

4.3 Hydraulic Gradient

BES prepared a groundwater potentiometric surface map based on the December 8, 2004 gauging results. The groundwater gradient contours are shown in Figure 3. The gradient on December 8, 2004 was towards the northeast, toward Nawiliwili Stream, with a magnitude ranging from 0.132 foot per foot near the hillside (well MW-1) to 0.010 foot per foot in the downgradient flat area.

The groundwater gradient calculated from the August 27, 2004 gauging event had a similar groundwater gradient direction and magnitude. The groundwater gradient was not calculated for the November 5, 2004 Site visit due to insufficient gauging data.

4.4 Groundwater Sample Results

Laboratory analytical results for the groundwater samples collected on December 8, 2004 are summarized in Table 4; current and historical laboratory results are summarized in Table 5. BES has compared the analytical results of groundwater samples to "Tier 1 Action Levels for groundwater where rainfall is less than 200-centimeter per year (cm/y) and a drinking water source is threatened" from the HDOH TGM regulatory guidelines (HDOH, 2000). Additionally, detected analytes and results from the December 2004 sampling event are illustrated in Figure 4.

The analytes benzene, toluene, ethylbenzene, total xylenes, fluoranthene, and lead were not detected in any of the groundwater samples collected. TPH as diesel were detected only in the samples collected from recovery well RW-4 (02-1068.02-RW-4 and 02-1068.02-D); the concentrations were 1.9 and 1.7 milligrams per liter (mg/L). Naphthalene was detected in the samples collected from well RW-4 at concentrations of 42.7 and 57.8 micrograms per liter (ug/L), which are below the HDOH Tier 1 groundwater action level (GAL) of 240 ug/L. Acenaphthene was detected in the samples collected from wells RW-1, RW-3, and RW-4, with the highest concentration being 9.9 ug/L, well below the 320 ug/L action level. Benzo(a)pyrene was detected in the sample collected from well RW-4 at a concentration of 0.27 ug/L, which slightly exceeds the HDOH Tier 1 GAL of 0.20 ug/L; however, benzo(a)pyrene was not detected in the duplicate sample collected from well RW-4.

A complete copy of the laboratory analytical report and chain-of-custody form are included in Appendix C.

5.0 DISCUSSION

The passive product recovery skimmer maintained in recovery well RW-4 continues to collect trace amounts of residual diesel product; however, free product within the well appears only as a sheen. BES will continue periodically (approximately every 60 days) servicing the skimmer in recovery well RW-4 and monitoring the wells during the next semi-annual period based on the decreasing evidence of free product.

The groundwater gradient magnitude and direction toward the northeast remains similar to previous observations and is consistent throughout the year based on results from the on-going periodic skimmer servicing and gauging events at the Site.

The laboratory results show that petroleum compound concentrations continue to decrease and remain below HDOH Tier 1 action levels, with the exception of benzo(a)pyrene, which was detected in well RW-4 at a concentration exceeding its Tier 1 action level. Benzo(a)pyrene was detected in the sample collected from well RW-4 at a concentration of 0.27 ug/L, which slightly exceeds the HDOH Tier 1 GAL of 0.20 ug/L; however, benzo(a)pyrene was not detected in the duplicate sample collected from well RW-4.

Lead was not detected in any of the groundwater samples during this reporting period.

Wells RW-1, RW-3, and RW-4 will continue to be sampled semi-annually until no sheen is evident in the water purged from the wells and no analytes are detected at concentrations exceeding the HDOH Tier 1 GALs. Wells MW-1, MW-2, MW-3, MW-4, and RW-2 were not sampled this period because no petroleum analytes have ever been detected in them at concentrations exceeding HDOH Tier 1 action levels (a monitoring period of at least 2.5 years). These five wells will continue to be gauged regularly but not sampled unless significant changes are observed during gauging or chemical concentrations significantly increase in wells RW-1, RW-3, and RW-4.

6.0 REFERENCES

BEI Environmental Services, 2002, *Diesel Spill Response, Well Installation, Product Recovery, and Groundwater Monitoring Report*, August 28, 2002.

BEI Environmental Services, 2003, *Semi-Annual Groundwater & Soil Management Unit Monitoring (August - December 2002)*, February 24, 2003.

BEI Environmental Services, 2004, *Semi-Annual Groundwater Monitoring Report, (July - December 2003)*, February 2, 2004 (BES Job No. 02-1068.01).

BEI Environmental Services, 2004, *Semi-Annual Groundwater Monitoring Report, (January through June 2004)*, July 20, 2004 (BES Job No. 02-1068.02)

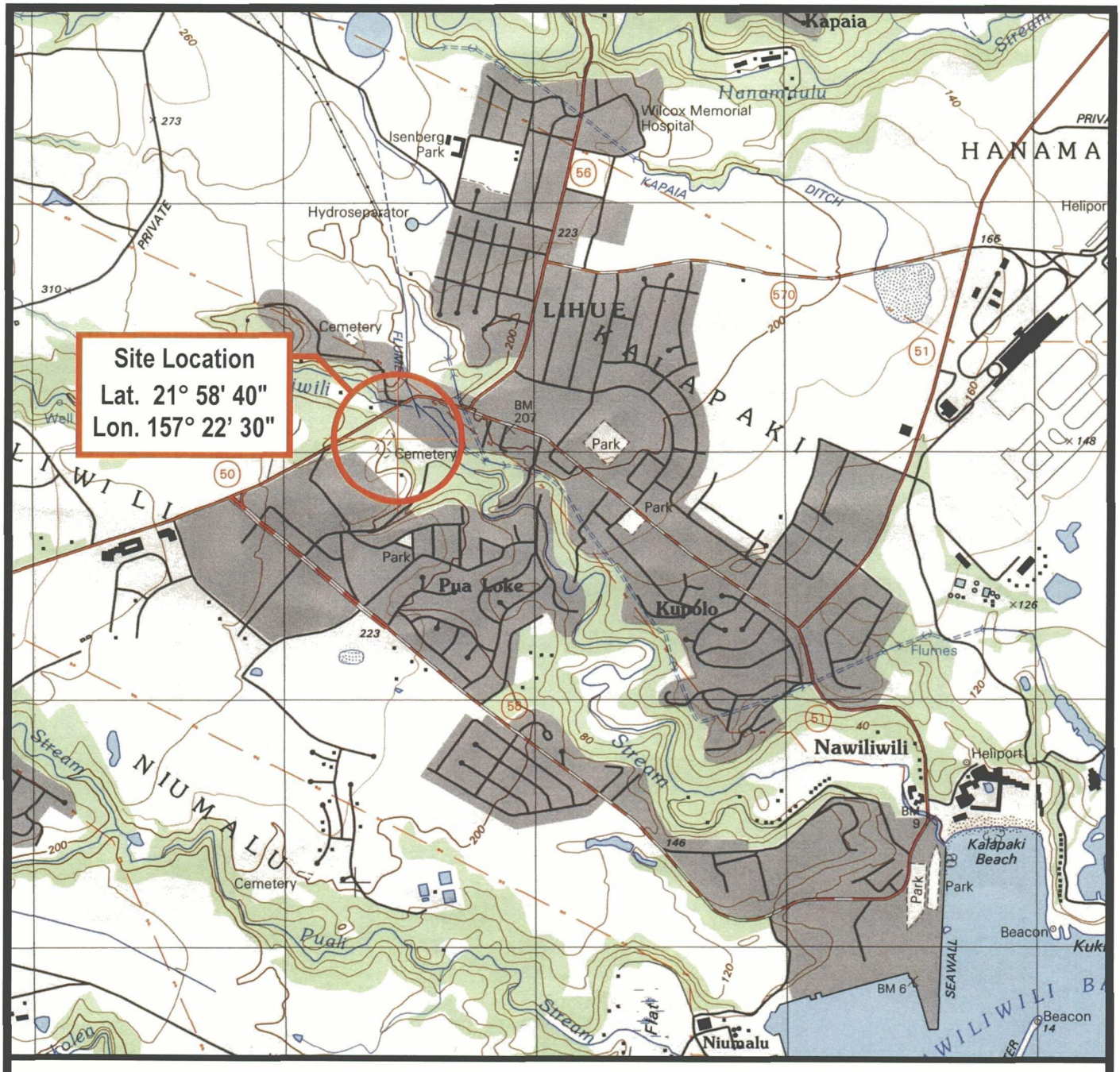
Brewer Environmental Services, 2001, *Diesel Spill Response Well Installation, Product Recovery, and Monitoring Work Plan*, September 12, 2001.

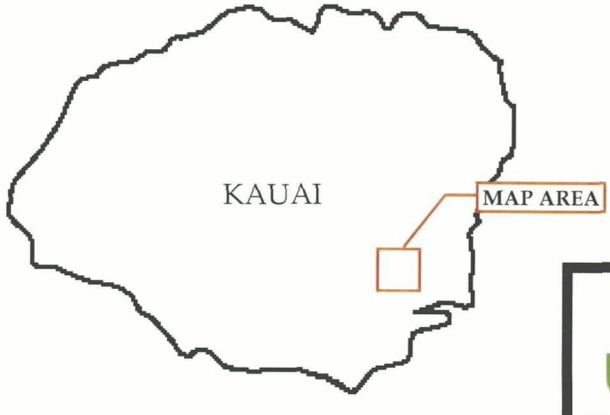
HDOH, 2000; State of Hawaii Department of Health, Solid and Hazardous Waste Branch, *Technical Guidance Manual for Underground Storage Tank Closure and Release Response,* rev. March 2000.

US EPA Test Methods for Evaluating Solid Waste, *Physical/Chemical Methods (SW 846)*, Rev. 3, December 1996.

US Department of Interior Geological Survey, Lihue Quadrangle, Island of Kauai, 7.5 Minute Series (Topographic), 1996.

FIGURES





Source:
U.S. Department of Interior Geographical Survey
Lihue Quadrangle
Lihue, Hawaii
1996, 7.5 Minute Series
Scale = 1:24,000

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Site Location Map		
Lihue Power Plant		
2940 Haleko Road • Lihue, Kauai, Hawaii 96766		
Job No.: 02-1068.02	Date: Dec 2004	Figure: 1

NAWILIWILI STREAM

Former Soil Management Unit

DAM

NAWILIWILI STREAM

HIGHWAY 50 (ABOVE)

Secondary Containment

Containment System

Tool Room and Engineer's Office

Store Room

Lihue "B" Mill

Lihue "A" Mill

Machine Shop

Tool Room

Bagasse Storage House

Bagasse Storage (pre 1964)

Power House

Containment Systems

Fire Room

Mill Office

Laboratory

Power Plant

Boilers

Ash Trailer

Stack

Boiler Feed Water

Line House

Sugar Bin

Three approx. 9,500-gallon ASTs

Approx. 23,000-gallon AST

Plastic-Lined and Fenced Containment System

Carpenter Shop

Open Carpenter Shop

Store Room

Store Room

Lumber Rack

SPILL SITE

Former Bldg and Debris

Hoist Tower

Molasses Storage Tank

Warehouse/Storage

Electric Shop

Offices

Water Storage For Boiler

MW-3

Rest Rooms

RW-4

RW-3

Old Stack

RW-2

RW-1

MW-4

MW-2

MW-1

Slope

Slope

Hillside

Slope

Slope

Hillside

Slope

Slope

Hillside

Transfer Pumps and Secondary Containment

LOCATION OF RELEASES

Former 5,000-gallon Waste Oil UST

Former 5,000-gallon UST

Cooling Towers

Quonset Warehouse

HALEKO ROAD

LEGEND

Fenceline

MW-1 Monitoring Well Location and Designation

Former Petroleum Storage or Collection Area

NOTE: FEATURES WERE DUPLICATED FROM DWG NO 29-41, DATED 6-22-1955. SOME OF THESE FEATURES MAY DIFFER FROM THE ORIGINAL OR NO LONGER EXIST.

N

0 20' 40' 80'

0 10' 40' 80'

SCALE 1" = 80'

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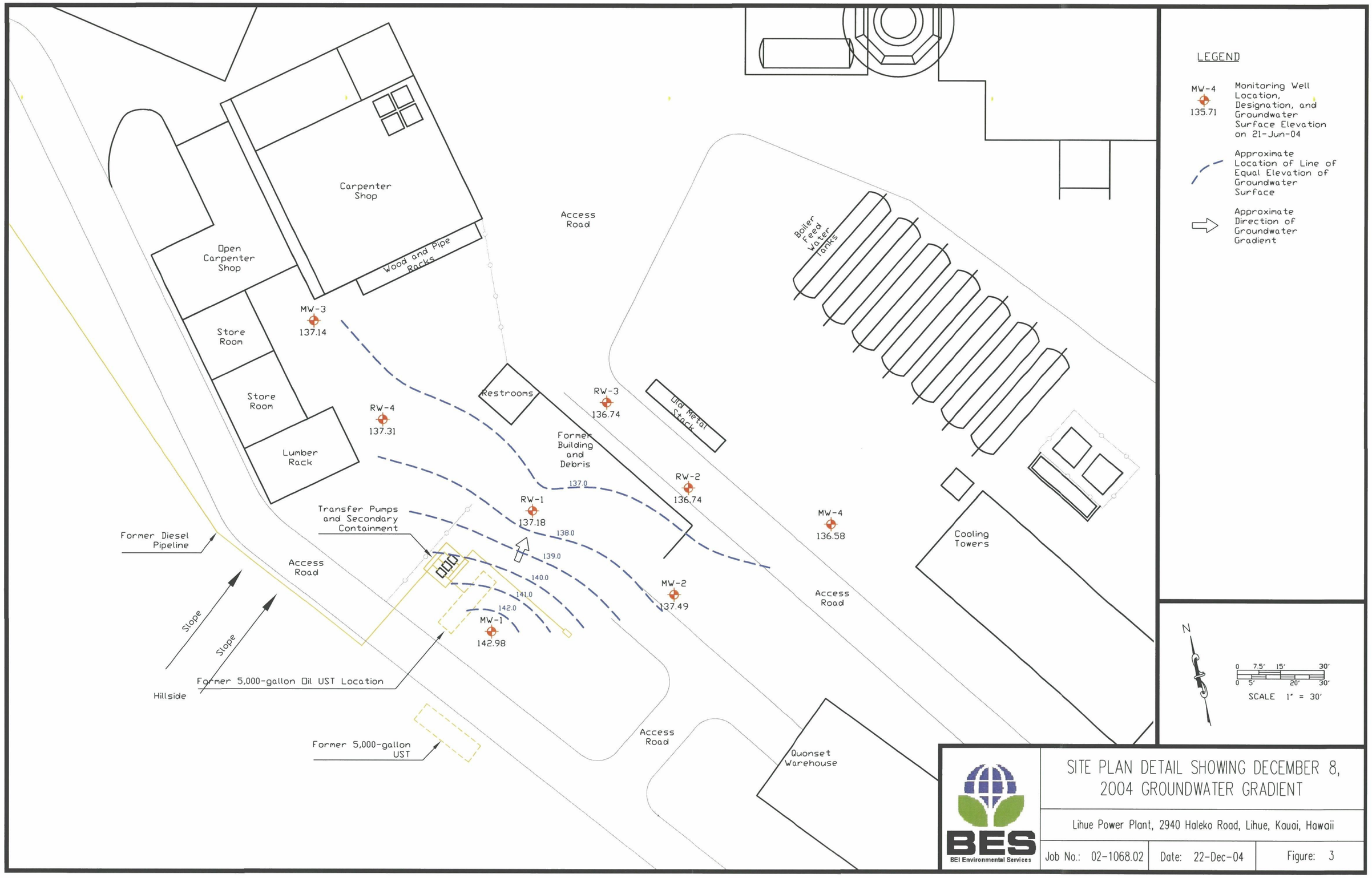
SITE PLAN

Lihue Power Plant, 2940 Haleko Road, Lihue, Kauai, Hawaii

Job No.: 02-1068.02 | Date: 22-Dec-04 | Figure: 2



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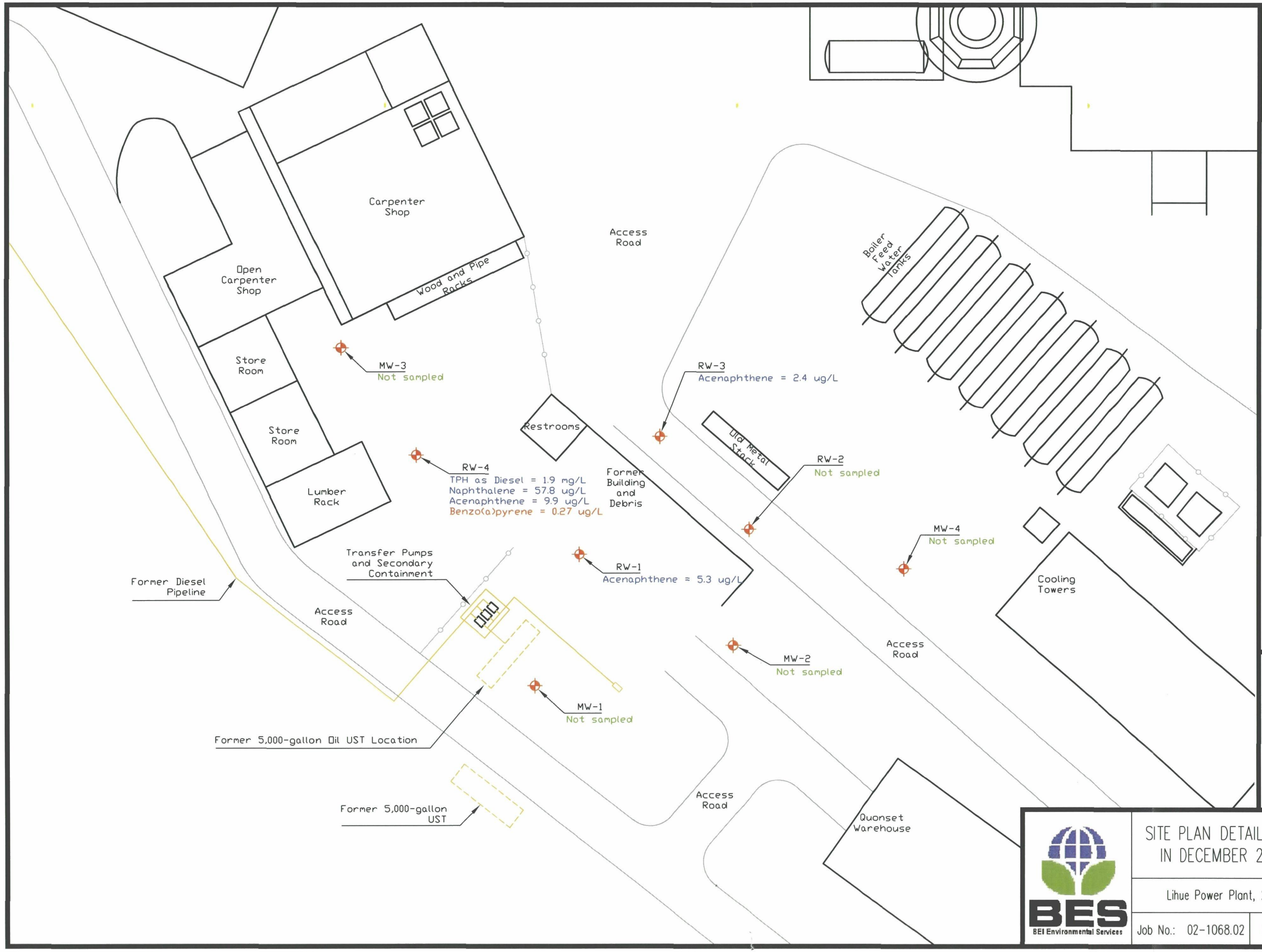
SITE PLAN DETAIL SHOWING DECEMBER 8, 2004 GROUNDWATER GRADIENT

Lihue Power Plant, 2940 Haleko Road, Lihue, Kauai, Hawaii

Job No.: 02-1068.02	Date: 22-Dec-04	Figure: 3



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SITE PLAN DETAIL SHOWING DETECTED ANALYTES IN DECEMBER 2004 GROUNDWATER SAMPLES

Lihue Power Plant, 2940 Haleko Road, Lihue, Kauai, Hawaii

Job No.: 02-1068.02	Date: 22-Dec-04	Figure: 4

TABLES

TABLE 1
Diesel Spill and Recovery Estimates

Dates From	Dates To	Activity	Est Diesel Spilled (gallons)	Est Diesel Recovered (gallons)	Est Diesel Remaining (gallons)
26-Jul-01	26-Jul-01	Diesel spill occurred during fuel off-loading to the hillside AST.	6,000		6,000
26-Jul-01	26-Jul-01	Recovery of free standing diesel from transfer pump sump area.		1,900	4,100
26-Jul-01	29-Jul-01	Recovery of diesel fuel with the removal and stockpiling of diesel-contaminated soil.		1,800	2,300
26-Jul-01	22-Aug-01	Recovery of diesel fuel with the skimming of the collection area and recovery trenches.		820	1,480
22-Aug-01	22-Aug-01	Recovery of diesel fuel with the skimming of the collection area and recovery trenches.		49	1,431
3-Oct-01	3-Oct-01	Recovery of diesel fuel with the skimming of the collection area and recovery trenches.		28	1,403
31-Oct-01	31-Oct-01	Diesel spill occurred during fuel off-loading to the hillside AST.	1,600		3,003
31-Oct-01	31-Oct-01	Recovery of free standing diesel from transfer pump sump area.		1,550	1,453
31-Oct-01	1-Nov-01	Recovery of diesel fuel with the skimming of the excavated collection area adjacent to the pump.		18	1,435
15-Dec-01	15-Dec-01	Recovery of diesel fuel during recovery well development.		2	1,433
9-Jan-02	9-Jan-02	Skimmer O&M Servicing.		1.2	1,431.8
20-Mar-02	20-Mar-02	Skimmer O&M Servicing.		0.8	1,431.0
19-Apr-02	19-Apr-02	Skimmer O&M Servicing.		0.8	1,430.2
7-Jun-02	7-Jun-02	Skimmer O&M Servicing, SMU uncovering.		0.5	1,429.7
8-Jul-02	8-Jul-02	Skimmer O&M Servicing during groundwater sampling and waste disposal.		0.5	1,429.2
27-Jul-02	27-Jul-02	Skimmer O&M Servicing during SMU sampling.		0.5	1,428.7
13-Sep-02	13-Sep-02	Skimmer O&M Servicing.		0.4	1,428.3
4-Oct-02	4-Oct-02	Skimmer O&M Servicing.		0.4	1,427.9
25-Oct-02	25-Oct-02	Skimmer O&M Servicing.		0.5	1,427.4
8-Nov-02	8-Nov-02	Skimmer O&M Servicing.		0.5	1,426.9
13-Nov-02	13-Nov-02	Skimmer O&M Servicing.		0.5	1,426.4
4-Dec-02	4-Dec-02	Skimmer O&M Servicing.		0.5	1,425.9
12-Dec-02	13-Dec-02	Skimmer O&M Servicing and groundwater sampling from monitoring and recovery wells.		0.5	1,425.4
30-Dec-02	30-Dec-02	Skimmer O&M Servicing.		0.05	1,425.4
22-Jan-03	22-Jan-03	Skimmer O&M Servicing.		0.05	1,425.3
6-Mar-03	6-Mar-03	Skimmer O&M Servicing.		0.05	1,425.3
9-Apr-03	9-Apr-03	Skimmer O&M Servicing.		0.05	1,425.2
21-May-03	21-May-03	Skimmer O&M Servicing.		0.04	1,425.2
27-Jun-03	27-Jun-03	Skimmer O&M Servicing and groundwater sampling from monitoring and recovery wells.		0.04	1,425.1
13-Aug-03	13-Aug-03	Skimmer O&M Servicing.		0.03	1,425.1
3-Oct-03	3-Oct-03	Skimmer O&M Servicing.		0.04	1,425.1
7-Nov-03	7-Nov-03	Skimmer O&M Servicing.		0.01	1,425.0
15-Dec-03	16-Dec-03	Skimmer O&M Servicing and groundwater sampling from monitoring and recovery wells.		0.01	1,425.0
12-Feb-04	12-Feb-04	Skimmer O&M Servicing.		0.01	1,425.0
31-Mar-04	31-Mar-04	Skimmer O&M Servicing.		0.008	1,425.0
11-May-04	11-May-04	Skimmer O&M Servicing.		trace	1,425.0
21-Jun-04	21-Jun-04	Skimmer O&M Servicing and groundwater sampling from monitoring and recovery wells.		trace	1,425.0
27-Aug-04	27-Aug-04	Skimmer O&M Servicing.		trace	1,425.0
5-Nov-04	5-Nov-04	Skimmer O&M Servicing.		trace	1,425.0
8-Dec-04	8-Dec-04	Skimmer O&M Servicing and groundwater sampling from recovery wells.		trace	1,425.0
TOTALS			**7,600.0**	**6,175.0**	**1,425.0**

Notes:
Est = estimated

TABLE 2
Well Gauging Data
December 8, 2004

Well ID	Well Diameter (inch)	Well Depth (feet bMP)	Well MP Elevation (feet)	Depth to Water (feet bMP)	Groundwater Elevation (feet)
MW-1	2	27.02	154.82	11.84	142.98
MW-2	2	22.88	150.99	13.50	137.49
MW-3	2	23.64	150.46	13.32	137.14
MW-4	2	19.66	148.37	11.79	136.58
RW-1	4	24.42	153.30	16.12	137.18
RW-2	4	19.65	148.96	12.22	136.74
RW-3	4	18.62	149.00	12.26	136.74
RW-4	4	20.57	151.02	13.71	137.31

Notes:
Elevations are relative to Temporary Bench Mark-1 (TBM-1) with an assumed elevation of 150.00 feet above mean sea level (aMSL) based on the 1996 USGS 7.5 Minute Series Lihue Quadrangle.
bMP = below measuring point (or top, northernmost location of well casing)

TABLE 3
Current and Historic Well Gauging Data

Well ID	Date of Gauging	Well MP Elevation (feet)	Depth to Product (feet bMP)	Depth to Water (feet bMP)	Product Thickness (feet)	Groundwater Elevation (feet)
MW-1	17-Dec-01	154.82		16.84	0.00	137.98
	6-Jun-02	154.82		13.71	0.00	141.11
	8-Jul-02	154.82		15.83	0.00	138.99
	13-Sep-02	154.82		16.87	0.00	137.95
	4-Oct-02	154.82		17.11	0.00	137.71
	25-Oct-02	154.82		17.42	0.00	137.40
	8-Nov-02	154.82		17.45	0.00	137.37
	13-Nov-02	154.82		17.40	0.00	137.42
	4-Dec-02	154.82		16.36	0.00	138.46
	18-Dec-02	154.82		17.04	0.00	137.78
	30-Dec-02	154.82		16.94	0.00	137.88
	22-Jan-03	154.82		17.51	0.00	137.31
	6-Mar-03	154.82		12.14	0.00	142.68
	9-Apr-03	154.82		14.00	0.00	140.82
	21-May-03	154.82		14.59	0.00	140.23
	27-Jun-03	154.82		15.30	0.00	139.52
	13-Aug-03	154.82		15.81	0.00	139.01
	3-Oct-03	154.82		16.05	0.00	138.77
	7-Nov-03	154.82		15.41	0.00	139.41
	15-Dec-03	154.82		14.77	0.00	140.05
	12-Feb-04	154.82		13.66	0.00	141.16
	31-Mar-04	154.82		12.05	0.00	142.77
	11-May-04	154.82		13.16	0.00	141.66
	21-Jun-04	154.82		13.60	0.00	141.22
	27-Aug-04	154.82		14.56	0.00	140.26
	5-Nov-04	154.82		-		-
	8-Dec-04	154.82		11.84	0.00	142.98
MW-2	17-Dec-01	150.99		15.21	0.00	135.78
	6-Jun-02	150.99		12.99	0.00	138.00
	8-Jul-02	150.99		15.53	0.00	135.46
	13-Sep-02	150.99		13.53	0.00	137.46
	4-Oct-02	150.99		15.98	0.00	135.01
	25-Oct-02	150.99		16.51	0.00	134.48
	8-Nov-02	150.99		16.52	0.00	134.47
	13-Nov-02	150.99		16.39	0.00	134.60
	4-Dec-02	150.99		15.37	0.00	135.62
	18-Dec-02	150.99		16.22	0.00	134.77
	30-Dec-02	150.99		16.15	0.00	134.84
	22-Jan-03	150.99		16.93	0.00	134.06
	6-Mar-03	150.99		14.94	0.00	136.05
	9-Apr-03	150.99		14.41	0.00	136.58
	21-May-03	150.99		15.49	0.00	135.50
	27-Jun-03	150.99		16.07	0.00	134.92
	13-Aug-03	150.99		16.54	0.00	134.45
	3-Oct-03	150.99		16.62	0.00	134.37
	7-Nov-03	150.99		15.88	0.00	135.11
	15-Dec-03	150.99		15.20	0.00	135.79
	12-Feb-04	150.99		14.71	0.00	136.28
	31-Mar-04	150.99		13.21	0.00	137.78
	11-May-04	150.99		14.59	0.00	136.40
	21-Jun-04	150.99		14.54	0.00	136.45
	27-Aug-04	150.99		15.66	0.00	135.33
	5-Nov-04	150.99		-		-
	8-Dec-04	150.99		13.50	0.00	137.49
MW-3	17-Dec-01	150.46		14.55	0.00	135.91
	6-Jun-02	150.46		12.72	0.00	137.74
	8-Jul-02	150.46		15.16	0.00	135.30
	13-Sep-02	150.46		15.89	0.00	134.57
	4-Oct-02	150.46		15.64	0.00	134.82
	25-Oct-02	150.46		16.05	0.00	134.41
	8-Nov-02	150.46		15.91	0.00	134.55
	13-Nov-02	150.46		15.58	0.00	134.88
	4-Dec-02	150.46		14.62	0.00	135.84
	18-Dec-02	150.46		15.70	0.00	134.76
	30-Dec-02	150.46		15.57	0.00	134.89
	22-Jan-03	150.46		16.48	0.00	133.98
	6-Mar-03	150.46		14.20	0.00	136.26
	9-Apr-03	150.46		13.99	0.00	136.47
	21-May-03	150.46		15.13	0.00	135.33
	27-Jun-03	150.46		15.77	0.00	134.69
	13-Aug-03	150.46		16.21	0.00	134.25
	3-Oct-03	150.46		16.24	0.00	134.22
	7-Nov-03	150.46		15.53	0.00	134.93
	15-Dec-03	150.46		14.85	0.00	135.61
	12-Feb-04	150.46		14.45	0.00	136.01

TABLE 3
Current and Historic Well Gauging Data

Well ID	Date of Gauging	Well MP Elevation (feet)	Depth to Product (feet bMP)	Depth to Water (feet bMP)	Product Thickness (feet)	Groundwater Elevation (feet)
	31-Mar-04	150.46		12.97	0.00	137.49
	11-May-04	150.46		14.40	0.00	136.06
	21-Jun-04	150.46		14.34	0.00	136.12
	27-Aug-04	150.46		15.42	0.00	135.04
	5-Nov-04	150.46		12.30	0.00	138.16
	8-Dec-04	150.46		13.32	0.00	137.14
MW-4	17-Dec-01	148.37		13.80	0.00	134.57
	6-Jun-02	148.37		10.70	0.00	137.67
	8-Jul-02	148.37		13.42	0.00	134.95
	13-Sep-02	148.37		15.54	0.00	132.83
	4-Oct-02	148.37		13.61	0.00	134.76
	25-Oct-02	148.37		14.16	0.00	134.21
	8-Nov-02	148.37		14.27	0.00	134.10
	13-Nov-02	148.37		14.17	0.00	134.20
	4-Dec-02	148.37		13.16	0.00	135.21
	18-Dec-02	148.37		13.97	0.00	134.40
	30-Dec-02	148.37		13.93	0.00	134.44
	22-Jan-03	148.37		14.69	0.00	133.68
	6-Mar-03	148.37		11.77	0.00	136.60
	9-Apr-03	148.37		12.37	0.00	136.00
	21-May-03	148.37		13.51	0.00	134.86
	27-Jun-03	148.37		14.06	0.00	134.31
	13-Aug-03	148.37		14.49	0.00	133.88
	3-Oct-03	148.37		14.52	0.00	133.85
	7-Nov-03	148.37		13.81	0.00	134.56
	15-Dec-03	148.37		13.15	0.00	135.22
	12-Feb-04	148.37		13.81	0.00	134.56
	31-Mar-04	148.37		11.36	0.00	137.01
	11-May-04	148.37		12.76	0.00	135.61
	21-Jun-04	148.37		12.66	0.00	135.71
	27-Aug-04	148.37		13.74	0.00	134.63
	5-Nov-04	148.37		-		-
	8-Dec-04	148.37		11.79	0.00	136.58
RW-1	17-Dec-01	153.30		17.60	0.00	135.70
	6-Jun-02	153.30	15.45	15.47	0.02	137.85
	8-Jul-02	153.30	18.03	18.06	0.03	135.26
	13-Sep-02	153.30	18.32	18.37	0.05	134.97
	4-Oct-02	153.30	18.41	18.44	0.03	134.88
	25-Oct-02	153.30	18.90	18.91	0.01	134.40
	8-Nov-02	153.30	18.86	18.87	0.01	134.44
	13-Nov-02	153.30		18.65	0.00	134.65
	4-Dec-02	153.30		17.71	0.00	135.59
	18-Dec-02	153.30		18.62	0.00	134.68
	30-Dec-02	153.30		18.51	0.00	134.79
	22-Jan-03	153.30		19.35	0.00	133.95
	6-Mar-03	153.30		16.32	0.00	136.98
	9-Apr-03	153.30		16.88	0.00	136.42
	21-May-03	153.30		18.01	0.00	135.29
	27-Jun-03	153.30		18.57	0.00	134.73
	13-Aug-03	153.30		19.01	0.00	134.29
	3-Oct-03	153.30		19.05	0.00	134.25
	7-Nov-03	153.30		18.34	0.00	134.96
	15-Dec-03	153.30	spotty sheen	17.68	0.00	135.62
	12-Feb-04	153.30		17.24	0.00	136.06
	31-Mar-04	153.30		15.81	0.00	137.49
	11-May-04	153.30		17.15	0.00	136.15
	21-Jun-04	153.30		17.10	0.00	136.20
	27-Aug-04	153.30		18.18	0.00	135.12
	5-Nov-04	153.30		-		-
	8-Dec-04	153.30		16.12	0.00	137.18
RW-2	17-Dec-01	148.96		13.46	0.00	135.50
	6-Jun-02	148.96		11.38	0.00	137.58
	8-Jul-02	148.96		13.96	0.00	135.00
	13-Sep-02	148.96		14.18	0.00	134.78
	4-Oct-02	148.96		14.22	0.00	134.74
	25-Oct-02	148.96		14.76	0.00	134.20
	8-Nov-02	148.96		14.78	0.00	134.18
	13-Nov-02	148.96		14.61	0.00	134.35
	4-Dec-02	148.96		13.65	0.00	135.31
	18-Dec-02	148.96		14.51	0.00	134.45
	30-Dec-02	148.96		14.42	0.00	134.54
	22-Jan-03	148.96		15.21	0.00	133.75
	6-Mar-03	148.96		13.15	0.00	135.81
	9-Apr-03	148.96		12.87	0.00	136.09

TABLE 3
Current and Historic Well Gauging Data

Well ID	Date of Gauging	Well MP Elevation (feet)	Depth to Product (feet bMP)	Depth to Water (feet bMP)	Product Thickness (feet)	Groundwater Elevation (feet)
	21-May-03	148.96		13.99	0.00	134.97
	27-Jun-03	148.96		14.52	0.00	134.44
	13-Aug-03	148.96		14.97	0.00	133.99
	3-Oct-03	148.96		15.00	0.00	133.96
	7-Nov-03	148.96		14.31	0.00	134.65
	15-Dec-03	148.96		13.65	0.00	135.31
	12-Feb-04	148.96		13.28	0.00	135.68
	31-Mar-04	148.96		11.88	0.00	137.08
	11-May-04	148.96		13.23	0.00	135.73
	21-Jun-04	148.96		13.15	0.00	135.81
	27-Aug-04	148.96		14.20	0.00	134.76
	5-Nov-04	148.96		-		-
	8-Dec-04	148.96		12.22	0.00	136.74
RW-3	17-Dec-01	149.37		13.81	0.00	135.56
	6-Jun-02	149.37		11.80	0.00	137.57
	8-Jul-02	149.37		14.35	0.00	135.02
	13-Sep-02	149.37		14.59	0.00	134.78
	4-Oct-02	149.37		14.65	0.00	134.72
	25-Oct-02	149.00		14.77	0.00	134.23
	8-Nov-02	149.00		14.75	0.00	134.25
	13-Nov-02	149.00		14.57	0.00	134.43
	4-Dec-02	149.00		13.63	0.00	135.37
	18-Dec-02	149.00		14.51	0.00	134.49
	30-Dec-02	149.00		14.42	0.00	134.58
	22-Jan-03	149.00		15.22	0.00	133.78
	6-Mar-03	149.00		13.15	0.00	135.85
	9-Apr-03	149.00		12.87	0.00	136.13
	21-May-03	149.00		14.01	0.00	134.99
	27-Jun-03	149.00		14.56	0.00	134.44
	13-Aug-03	149.00		14.99	0.00	134.01
	3-Oct-03	149.00		15.02	0.00	133.98
	7-Nov-03	149.00		14.32	0.00	134.68
	15-Dec-03	149.00		13.67	0.00	135.33
	12-Feb-04	149.00		13.29	0.00	135.71
	31-Mar-04	149.00		11.91	0.00	137.09
	11-May-04	149.00		13.27	0.00	135.73
	21-Jun-04	149.00		13.20	0.00	135.80
	27-Aug-04	149.00		14.24	0.00	134.76
	5-Nov-04	149.00		11.28	0.00	137.72
	8-Dec-04	149.00		12.26	0.00	136.74
RW-4	17-Dec-01	151.02		15.13	0.00	135.89
	6-Jun-02	151.02		13.08	0.00	137.94
	8-Jul-02	151.02		15.63	0.00	135.39
	13-Sep-02	151.02	16.02	16.03	0.01	135.00
	4-Oct-02	151.02		16.09	0.00	134.93
	25-Oct-02	151.02		16.53	0.00	134.49
	8-Nov-02	151.02		16.35	0.00	134.67
	13-Nov-02	151.02		16.08	0.00	134.94
	4-Dec-02	151.02		15.19	0.00	135.83
	18-Dec-02	151.02		16.22	0.00	134.80
	30-Dec-02	151.02		16.03	0.00	134.99
	22-Jan-03	151.02		16.97	0.00	134.05
	6-Mar-03	151.02		14.05	0.00	136.97
	9-Apr-03	151.02		14.44	0.00	136.58
	21-May-03	151.02		15.62	0.00	135.40
	27-Jun-03	151.02		16.21	0.00	134.81
	13-Aug-03	151.02		16.67	0.00	134.35
	3-Oct-03	151.02		16.73	0.00	134.29
	7-Nov-03	151.02		16.01	0.00	135.01
	15-Dec-03	151.02	slight sheen	15.33	0.00	135.69
	12-Feb-04	151.02		14.87	0.00	136.15
	31-Mar-04	151.02		13.40	0.00	137.62
	11-May-04	151.02		14.82	0.00	136.20
	21-Jun-04	151.02		14.79	0.00	136.23
	27-Aug-04	151.02		15.87	0.00	135.15
	5-Nov-04	151.02		12.73	0.00	138.29
	8-Dec-04	151.02		13.71	0.00	137.31

Notes:
Elevations are relative to Temporary Bench Mark-1 (TBM-1) with an assumed elevation of 150.00 feet mean sea level (aMSL) based on the 1996 USGS 7.5 Minute Series Lihue Quadrangle.
bMP = below measuring point (or top, northernmost location of well casing)
Specific gravity of product assumed to be 0.75
- = not measured

TABLE 4
Groundwater Sample Laboratory Analytical Results
December 8, 2004

Well ID	Sample ID	Date	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Acenaphthene	Fluoranthene	Benzo(a)pyrene	Lead
		EPA Method:	8015 M	8021B	8021B	8021B	8021B	8100	8100	8100	8100	7010
		Reporting Limit:	1.5	5.0	50	50	150	0.20	0.20	0.20	0.20	2.0
		Units:	(mg/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
RW-1	02-1068.02-RW-1	8-Dec-04	ND	ND	ND	ND	ND	ND	5.3	ND	ND	ND
RW-3	02-1068.02-RW-3	8-Dec-04	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND
RW-4	02-1068.02-RW-4	8-Dec-04	1.9	ND	ND	ND	ND	42.7	9.9	ND	**0.27**	ND
RW-4	02-1068.02-D	8-Dec-04	1.7	ND	ND	ND	ND	57.8	6.6	ND	ND	ND
HDOH Tier 1 GWALs - DWT<200			NS	5.0	1,000	140	10,000	240	320	13	0.20	5.6

NOTES:
TPH = Total petroleum hydrocarbons
BTEX = Benzene, toluene, ethylbenzene, and total xylenes
PAHs = Polynuclear aromatic hydrocarbons
mg/L = Milligrams per liter (ppm - parts per million)
ug/L = Micrograms per liter (ppb - parts per billion)
ND = Not detected at or above the reporting limit listed at top of column
HDOH Tier 1 GWALs = State of Hawaii Department of Health Tier 1 groundwater action levels from March 2000 Technical Guidance Manual
DWT<200 = Drinking water source threatened where rainfall is less than 200-centimeters a year
NS = No standard/regulatory guideline for analyte
Bold = HDOH Tier 1 GWAL exceedance

TABLE 5
Summary of Current and Historic Groundwater Laboratory Analytical Results

Well ID	Date	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Acenaphthene	Fluoranthene	Benzo(a)pyrene	Lead	Cadmium
	EPA Method:	8015 M	8021B	8021B	8021B	8021B	8100	8100	8100	8100	6010B/7010	6010B
	Reporting Limit:	1.5	5.0	50	50	150	0.20	0.20	0.20	0.20	5.0	3.0
	Units:	(mg/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MW-1	17-Dec-01	ND <0.6	ND <0.5	ND <0.5	ND <0.5	ND <0.5	ND	ND	ND	ND	-	-
	8-Jul-02	6.89	ND <1.	ND <1.	ND <1.	ND <2.	ND <0.4	ND <0.4	ND	ND <0.12	ND	ND <5.
	18-Dec-02	ND <0.2	ND <1.	ND <1.	ND <1.	ND <1.	ND	ND	ND	ND	**6.5**	ND <0.5
	27-Jun-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-Dec-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.6**	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
	8-Dec-04	-	-	-	-	-	-	-	-	-	-	-
MW-2	17-Dec-01	ND <0.6	ND <0.5	ND <0.5	ND <0.5	ND <0.5	ND	ND	ND	ND	-	-
	8-Jul-02	7.22	ND <1.	ND <1.	ND <1.	ND <2.	ND <0.4	ND <0.4	ND	ND <0.12	**27.4**	ND <5.
	18-Dec-02	ND <0.2	ND <1.	ND <1.	ND <1.	ND <1.	ND	ND	ND	ND	**11.2**	ND <0.5
	27-Jun-03	ND	ND	ND	ND	ND	0.21	ND	ND	ND	ND	ND
	15-Dec-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
	8-Dec-04	-	-	-	-	-	-	-	-	-	-	-
MW-3	17-Dec-01	ND <0.6	ND <0.5	ND <0.5	ND <0.5	ND <0.5	ND	ND	ND	ND	-	-
	8-Jul-02	7.46	ND <1.	ND <1.	ND <1.	ND <2.	0.918	ND <0.4	ND	ND <0.12	ND	ND <5.
	18-Dec-02	ND <0.2	ND <1.	ND <1.	ND <1.	ND <1.	ND	ND	ND	ND	2.81	ND <0.5
	27-Jun-03	ND	ND	ND	ND	ND	0.190	ND	ND	ND	ND	ND
	15-Dec-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	0.29	0.24	ND	ND	-
	8-Dec-04	-	-	-	-	-	-	-	-	-	-	-
MW-4	17-Dec-01	ND <0.6	ND <0.5	ND <0.5	ND <0.5	ND <0.5	ND	ND	ND	ND	-	-
	8-Jul-02	7.08	ND <1.	ND <1.	ND <1.	ND <2.	ND <0.4	ND <0.4	ND	ND <0.12	**47.1**	ND <5.
	18-Dec-02	ND <0.2	ND <1.	ND <1.	ND <1.	ND <1.	ND	ND	ND	ND	**37.7**	ND <0.5
	27-Jun-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.0**	ND
	15-Dec-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
	8-Dec-04	-	-	-	-	-	-	-	-	-	-	-
RW-1	16-Dec-03	ND	ND	ND	ND	ND	1.8	2.0	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	4.04	ND	ND	ND	-
	8-Dec-04	ND	ND	ND	ND	ND	ND	5.3	ND	ND	ND <2.	-

TABLE 5
Summary of Current and Historic Groundwater Laboratory Analytical Results

Well ID	Date	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Acenaphthene	Fluoranthene	Benzo(a)pyrene	Lead	Cadmium
	EPA Method:	8015 M	8021B	8021B	8021B	8021B	8100	8100	8100	8100	6010B/7010	6010B
	Reporting Limit:	1.5	5.0	50	50	150	0.20	0.20	0.20	0.20	5.0	3.0
	Units:	(mg/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
RW-2	17-Dec-01	No Sample. Sheen dectected upon gauging and product recovered during well development.										
	8-Jul-02	21	1.76	ND <1.	ND <1.	4.34	4.06	6.39	ND	ND <0.12	ND	ND <5.
	18-Dec-02	9.1	ND <1.	ND <1.	ND <1.	ND <1.	ND	ND	ND	ND	1.77	ND <0.5
	27-Jun-03	2.5	ND	ND	ND	ND	ND	ND	0.420	ND	ND	ND
	15-Dec-03	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	0.61	ND	ND	ND	-
	8-Dec-04	-	-	-	-	-	-	-	-	-	-	-
RW-3	17-Dec-01	No Sample. Sheen detected upon gauging and product recovered during well development.										
	8-Jul-02	6.37	2.09	ND <1.	ND <1.	4.12	60.4	6.34	0.260	ND <0.12	ND	ND <5.
	18-Dec-02	4.70	ND <1.	ND <1.	ND <1.	ND <1.	13.0	ND	ND	ND	0.45	ND <0.5
	27-Jun-03	ND	ND	ND	ND	ND	ND	ND	0.30	ND	ND	ND
	16-Dec-03	ND	ND	ND	ND	ND	1.8	2.0	ND	ND	ND	ND
	21-Jun-04	ND	ND	ND	ND	ND	ND	ND	0.24	ND	ND	-
	8-Dec-04	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND <2.	-
RW-4	17-Dec-01	No Sample. Heavy sheen detected upon gauging and product recovered during well development.										
	8-Jul-02	ND <1,500.	4.58	1.77	17.3	59.7	99.5	252	**15.1**	ND <3.03	**20.6**	ND <5.
	18-Dec-02	No Sample. Heavy sheen detected upon gauging and product recovered from skimmer.										
	27-Jun-03	No Sample. Heavy sheen detected upon gauging and product recovered from skimmer.										
	16-Dec-03	50	**16**	ND	ND	ND	ND <6.	ND <6.	11.4	ND <6.	ND	ND
	21-Jun-04	3.3	ND	ND	ND	ND	161.0	31.7	1.31	ND	ND	-
	8-Dec-04	1.9	ND	ND	ND	ND	57.8	9.9	ND	**0.27** D	ND <2.	-
HDOH Tier 1 GWALs - I		NS	5.0	1,000	140	10,000	240	320	13	0.20	5.6	5.0

NOTES:
TPH = Total petroleum hydrocarbons
BTEX = Benzene, toluene, ethylbenzene, and total xylenes
PAHs = Polynuclear aromatic hydrocarbons
mg/L = Milligrams per liter (ppm - parts per million)
ug/L - Micrograms per liter (ppb - parts per billion)
ND = Not detected at or above the reporting limit listed at top of column
- = Not analyzed
<0.0060 = Reporting limit other than that listed at top of column
HDOH Tier 1 GWALs = State of Hawaii Department of Health Tier 1 groundwater action levels from March 2000 Technical Guidance Manual
DWT = Drinking water source threatened
<200 = Rainfall less than 200-centimeters a year
NS = No standard/regulatory guideline for analyte
Bold = HDOH Tier 1 GWAL exceedance
D = Benzo(a)pyrene was not detected in the duplicate sample

APPENDIX A

Standard Operating Procedures

STANDARD OPERATING PROCEDURE #1
EQUIPMENT DECONTAMINATION

This Standard Operating Procedure (SOP) states how BEI Environmental Services (BES) personnel decontaminate equipment. All equipment that comes in contact with potentially contaminated media must be decontaminated prior to reuse of the equipment. This includes, for example, split-spoon soil samplers, bailers, and interface probes. Disposable equipment is not to be decontaminated and reused, only equipment designed for reuse will be decontaminated and reused by BES personnel.

There are two acceptable decontamination procedures. First is steam cleaning and the second is hand washing with non-phosphate detergent and rinsing.

Steam Cleaning

Steam cleaning is typically performed by drilling and other contractors prior to reusing drilling rods and other heavy or large equipment. Steam cleaning equipment will be operated by qualified subcontractor personnel. BES personnel should verify that the equipment is operating properly such that the water is actually heated and not just a pressure wash. Steam cleaning will be performed such that the excess water is collected.

Hand Wash and Rinse

Standard Decontamination

BES or subcontractor personnel can use hand washing and rinse as a decontamination method. The following steps are performed to decontaminate a piece of equipment:

1. Wash equipment in a bucket containing a non-phosphate detergent/tap or distilled water solution using a scrub brush, bottle brush, and/or scrub pad, as needed.
2. Rinse equipment once in a second bucket containing distilled water.
3. Rinse equipment a second time in a third bucket containing distilled water.
4. Allow the equipment to completely air dry.

Additional Decontamination

If a piece of equipment is particularly dirty additional solutions can be used to decontaminate it. These include:

- Isopropyl alcohol to remove petroleum staining
- Acid solutions to remove inorganic and/or organic deposits

After these solutions have been used to decontaminate a piece of equipment, the four standard decontamination steps above must be performed.

STANDARD OPERATING PROCEDURE #3
GROUNDWATER SAMPLE COLLECTION USING A BAILER

This Standard Operating Procedure (SOP) states how BEI Environmental Services (BES) personnel collect representative aqueous samples from temporary and permanent groundwater monitoring wells using a bailer.

1. Unlock, if appropriate, and open wellhead cover.
2. Unlock, if appropriate, and remove cap from the top of the well casing.
3. Measure the static water level in the well and total depth of the well to the nearest 0.01-foot relative to the well's designated measuring point (MP) using a decontaminated probe (Refer to SOPs for Decontamination and Monitoring Well Gauging).
4. Calculate the well casing volume using the formula: $\mathbf{V = (D)^2 \times (TD - DTW) \times (0.041)}$; where V = one well casing volume in gallons, D = well diameter in inches, TD = total depth of well in feet below MP, and DTW = depth to water in well in feet below MP.
5. Calculate the depth to water that will correspond with 80 percent recovery after purging is complete using the formula: $\mathbf{WL^{80} = TD - ((TD - DTW) * 0.80)}$; where WL^{80} is the water level in feet below MP when 80 percent recovery is reached, TD = total depth of well in feet below MP, and DTW = depth to water in well in feet below MP.
6. Attach a sufficient length of new or dedicated rope to the top of the bailer to be used to purge the well. The following bailer types can be used to purge groundwater from a well:
   - dedicated, disposable polyethylene, PVC, or Teflon® bailer, or
   - decontaminated stainless-steel, acrylic, PVC, or Teflon® bailer.
7. Secure the other end of the rope to a secure object that cannot fit into the well casing.
8. Lower the bailer into the well, allow it to completely fill with groundwater, then retrieve the bailer from the well with a minimum of disturbance to the water column.
9. Pour recovered groundwater from the bailer into a bucket of known volume. Repeat steps 8 and 9 until one well casing volume of groundwater has been purged from the well.
10. Repeat step 8 then pour the bailer contents into a container suitable for measuring the water quality parameters pH, temperature, and specific conductance (conductivity).
11. Measure and record the pH, temperature, and specific conductance (conductivity) of the most recently recovered groundwater using electronic meters. These parameters should be recorded as follows:
    - pH to the nearest 0.1 unit,
    - temperature to the nearest 0.5 degree Celsius, and
    - specific conductance (conductivity) to three significant figures and corrected to 25 degrees Celsius.

12. Repeat steps 8, 9, 10, and 11 until at least four well casing volumes of groundwater have been purged from the well and the two most recent water quality parameter readings are stable to the following criteria or the well is bailed dry:
    - pH varies less than 0.5 unit,
    - temperature varies less than 1 degree Celsius, and
    - specific conductance varies less than 10 percent of first value.
13. Allow the water column to recover to 80 percent or more of its original thickness (measure depth to water to verify, see result of step 5) at the completion of purging the well, or if the well is bailed dry. Proceed if the well has not recovered within 2 hours of purging.
14. Label all required sample bottles with at least the sample number and date and approximate time of sample collection.
15. Begin the sample collection process by repeating step 5 if a different bailer is to be used to collect the sample. The following bailer types can be used to sample groundwater from a well:
    - dedicated, disposable polyethylene, PVC, or Teflon® bailer, or
    - decontaminated Teflon® bailer.
16. Repeat step 7 with the sample bailer and pour the first bailer full of groundwater into a bucket if the sample bailer is not the same bailer used to purge the well.
17. Repeat step 7 and place the recovered groundwater in the required sample bottles until all the required bottles are full. Sample bottles should be filled and closed in the following order using the indicated methods:
    a. 40-milliliter (mL) volatile organic analysis (VOA) vials using a bailer bottom-emptying device until completely full, then cap the vials with screw caps having Teflon®-lined septa so that there are no air bubbles in the vials.
    b. Other clear or amber glass bottles using the bailer bottom-emptying device or pouring from the top of the bailer until approximately 90 percent full, then cap the bottles with Teflon®-lined screw caps.
    c. Plastic bottles using the bailer bottom-emptying device or pouring from the top of the bailer until approximately 90 percent full then capped with plastic screw caps.
18. Place the sample bottles in a water-ice-chilled chest.
19. Replace the well cap and lock it, if appropriate.
20. Close the wellhead cover and lock it, if appropriate.

APPENDIX B

Groundwater Sample Collection Data Sheets

GROUNDWATER SAMPLING USING A BAILER

Proj. Name: Lihue Power Plant GW Mon. 2004 **Well #:** RW-1
Project #: 02-1068.02 **Location:**
Proj. Mgr: S. Mandiva **Date:** 12-8-04
Field Reps: S. Mandiva **SOPs Used:** #3

Start GWater Level (feet bMP): 16.12 (DTW)
Well Total Depth (feet bMP): 24.42 (TD)
Water Column Height (feet): 8.30 (TD – DTW = WCH)
Well Diameter (inches): 4" (D)
Well Casing Volume (gallons): 5.45 (D * D * WHC * 0.041 = V)
80 Percent Recovery (feet bMP): 17.78 (TD - (WCH * 0.80) = WL80)
6.64

PURGING MEASUREMENTS

Casing Volume #	Time	Cum Vol Purged (gallons)	GWater Level (feet bMP)	Temp. (deg C)	pH	Specific Conduct. (uS @ 25C)	Comments: (odor, product, silt, etc.)
start	1302	0	-	25.6	6.05	332.8	clear, slight odor, no SL
1	1309	6	-	25.2	6.04	342.6	clear, streaks of sheen, slight odor
2	1317	12	-	24.8	5.96	354.8	clear, slight odor, no sheen
3	1325	18	-	24.8	6.02	347.7	" " "
4	1333	24	16.28	24.7	6.04	351.4	
Sample	1340						
Stable Criteria:			80%	1 deg C	0.5	10%	for two readings

Sample Information:

Primary Sample ID: 02-1068.02-RW-1
Duplicate Sample ID:
Field Blank ID:
Rinseate Sample ID:

Bottle Type	Number
1 L amber glass	1
250 ml plastic	1
40 ml voas	3

Equipment Used:

Decon: Liquinox + distilled water
Purge: whaler pump
Sample: whaler pump
Filter: 0.45 micron + pressure bailer for lead aliquot only
Interphase Probe: Solinst IP Model 122
H2O Parameters Meter: YSI meter model 63
Dispose: purgewater in 55-gal drum
Other:

Comments: filtered metals aliquot in field

BEI Environmental Services

GROUNDWATER SAMPLING USING A BAILER

Proj. Name: Libbie Power Plant GW Mon. 2004 **Well #:** RW-3
Project #: 02-1068.02 **Location:**
Proj. Mgr: S. Mandeno **Date:** 12-8-04
Field Reps: S. Mandeno **SOPs Used:** #3

Start GWater Level (feet bMP): 12.26 (DTW)
Well Total Depth (feet bMP): 18.62 (TD)
Water Column Height (feet): 6.36 (TD – DTW = WCH)
Well Diameter (inches): 4" (D)
Well Casing Volume (gallons): 4.17 (D * D * WHC * 0.041 = V)
80 Percent Recovery (feet bMP): 13.53 (TD - (WCH * 0.80) = WL80)
5.09

PURGING MEASUREMENTS

Casing Volume #	Time	Cum Vol Purged (gallons)	GWater Level (feet bMP)	Temp. (deg C)	pH	Specific Conduct. (uS @ 25C)	Comments: (odor, product, silt, etc.)
start	1149	0	-	26.6	5.96	420.4	clear, no odor, no silt
1	1153	4.5	-	26.3	6.38	380.1	"
2	1200	9.0	-	26.3	6.44	386.5	"
3	1207	13.5	-	26.3	6.48	391.3	"
4	1216	18.0	12.44	26.1	6.51	391.7	"
Sample	1220						
Stable Criteria:			80%	1 deg C	0.5	10%	for two readings

Sample Information:

Primary Sample ID: 02-1068.02-RW-3
Duplicate Sample ID:
Field Blank ID:
Rinseate Sample ID:

Bottle Type	Number
See RW-1	

Equipment Used:

Decon:
Purge:
Sample: See RW-1
Filter:
Interphase Probe:
H2O Parameters Meter:
Dispose:
Other:

Comments:

BEI Environmental Services

GROUNDWATER SAMPLING USING A BAILER

Proj. Name: 02-1068.02 **Well #:** RW-4
Project #: Lihue Power Plant GW Mon. 2004 **Location:**
Proj. Mgr: S. Mandina **Date:** 12-8-04
Field Reps: S. Mandina **SOPs Used:** #3

Start GWater Level (feet bMP): 13.71 (DTW)
Well Total Depth (feet bMP): 20.57 (TD)
Water Column Height (feet): 6.86 (TD – DTW = WCH)
Well Diameter (inches): 4" (D)
Well Casing Volume (gallons): 4.5 (D * D * WHC * 0.041 = V)
80 Percent Recovery (feet bMP): 15.08 (TD - (WCH * 0.80) = WL80)
5.49

PURGING MEASUREMENTS

Casing Volume #	Time	Cum Vol Purged (gallons)	GWater Level (feet bMP)	Temp. (deg C)	pH	Specific Conduct. (uS @ 25C)	Comments: (odor, product, silt, etc.)
start	1417	0	-	25.1	6.38	435.8	clear, slightly sheen, mod. odor
1	1430	4.5	-	24.3	6.36	470.1	"
2	1436	8.9	-	24.3	6.37	469.0	"
3	1440	13.5	-	24.4	6.36	493.9	clear, low sheen, mod. odor
4	1455	18.0	13.97	24.3	6.35	505	"
Sample	1500						
Stable Criteria:			80%	1 deg C	0.5	10%	for two readings

Sample Information:

Primary Sample ID: 02-1068.02-RW-4
Duplicate Sample ID: 02-1068.02-D 1515
Field Blank ID:
Rinseate Sample ID:

Bottle Type	Number
~~See FB-1~~	

Equipment Used:

Decon: Interphase Probe:
Purge: H2O Parameters Meter:
Sample: See RW-1 Dispose:
Filter: Other:

Comments:

BEI Environmental Services

APPENDIX C

Laboratory Analytical Report and Chain-of-Custody Form

ADVANCED ANALYTICAL LABORATORY, LLC

AAL Project #C403

BEI Environmental Services

Client Project #: 02-1068.02 Method: 8015M

Client Project Name: Lihue Power Plant Matrix: Water

CLIENT SAMPLE ID	TPH-DIESEL [mg/L]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	110%		12/13/2004
02-1068.02-RW-1	nd	114%		12/13/2004
02-1068.02-RW-3	nd	103%		12/13/2004
02-1068.02-RW-4	1.9	104%		12/13/2004
02-1068.02-RW-D	1.7	101%		12/13/2004
PQL	1.5	Acceptable Range		
MDL	0.30	70%-130%		

QA/QC DATA

QC BATCH # 121304	TPH-DIESEL [mg/L]	Acceptable Range
Lab Control Spike (LCS)	17.3	10.6-19.7
Matrix Spike (MS)	17.2	10.6-19.7
Matrix Spike Dup (MSD)	17.3	10.6-19.7
Recovery MS	114%	70%-130%
Recovery MSD	114%	70%-130%
RPD of MS/MSD	0.6%	20%

Analyst: U. Baumgartner, Ph.D.

Data review: E. Young

544 OHOHIA STREET, #10 HONOLULU HAWAII 96819
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ADVANCED ANALYTICAL LABORATORY, LLC

AAL Project #C403

BEI Environmental Services

Client Project #: 02-1068.02
Client Project Name: Lihue Power Plant

Method: 8021B
Matrix: Water

CLIENT SAMPLE ID	Benzene [mg/L]	Toluene [mg/L]	Ethylbenzene [mg/L]	Xylenes [mg/L]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	nd	nd	nd	88%		12/14/2004
02-1068.02-RW-1	nd	nd	nd	nd	86%		12/14/2004
02-1068.02-RW-3	nd	nd	nd	nd	89%		12/14/2004
02-1068.02-RW-4	nd	nd	nd	nd	89%		12/14/2004
02-1068.02-RW-D	nd	nd	nd	nd	89%		12/14/2004
PQL	0.005	0.05	0.05	0.15	Acceptable Range		
MDL	0.001	0.01	0.01	0.01	70%-130%		

QA/QC DATA

QC BATCH # 121404	Benzene [mg/L]	Toluene [mg/L]	Ethylbenzene [mg/L]	Xylenes [mg/L]	Acceptable Range	Xylenes
Lab Control Spike (LCS)	0.478	0.499	0.467	1.649	0.350-0.650	1.050-1.950
Matrix Spike (MS)	0.493	0.504	0.475	1.669	0.350-0.650	1.050-1.950
Matrix Spike Dup (MSD)	0.488	0.507	0.466	1.667	0.350-0.650	1.050-1.950
Recovery MS	99%	101%	95%	111%	70%-130%	
Recovery MSD	98%	101%	93%	111%	70%-130%	
RPD of MS/MSD	1.0%	0.6%	1.9%	0.1%	20%	

Analyst: E. Young
Data review: U. Baumgartner, Ph.D.

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ADVANCED ANALYTICAL LABORATORY, LLC

AAL Project #C403

BEI Environmental Services

Client Project #: 02-1068.02
Client Project Name: Lihue Power Plant

Method: 8100
Matrix: Water

CLIENT SAMPLE ID	Naphthalene (mg/L)	Acenaphthene (mg/L)	Fluoranthene (mg/L)	Benzo(a)pyrene (mg/L)	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	nd	nd	nd	122%		12/14/2004
02-1068.02-RW-1	nd	0.0053	nd	nd	106%		12/14/2004
02-1068.02-RW-3	nd	0.0024	nd	nd	104%		12/14/2004
02-1068.02-RW-4	*0.0427	**0.0099	nd	0.00027	MI	*DF 10, **DF 5	12/14/2004
02-1068.02-RW-D	*0.0578	**0.0066	nd	nd	91%	*DF 10, **DF 5	12/14/2004
PQL	0.00020	0.00020	0.00020	0.00020	Acceptable Range		
MDL	0.00005	0.00005	0.00005	0.00005	70%-130%		

QA/QC DATA

QC BATCH #121404	Naphthalene (mg/L)	Acenaphthene (mg/L)	Fluoranthene (mg/L)	Benzo(a)pyrene (mg/L)	Acceptable Range
Lab Control Spike (LCS)	0.00515	0.00523	0.00531	0.00585	0.00350-0.00650
Matrix Spike (MS)	0.00504	0.00507	0.00503	0.00522	0.00350-0.00650
Matrix Spike Dup (MSD)	0.00506	0.00506	0.00500	0.00523	0.00350-0.00650
Recovery MS	101%	101%	101%	104%	70%-130%
Recovery MSD	101%	101%	100%	105%	70%-130%
RPD of MS/MSD	0.4%	0.1%	0.6%	0.2%	20%

Analyst: E. Young
Data review: U. Baumgartner, Ph.D.

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TEL (808) 836-2252 FAX (808) 836-2250

Advanced Analytical Laboratory
(425) 497-0110, fax (425) 497-8089

AAL Job Number:	A41210-1
Client:	Advanced Analytical Laboratory LLC
Project Manager:	Uwe Baumgartner
Client Project Name:	Lihue Power Plant
Client Project Number:	C403
Date received:	12/10/04

Analytical Results				02-1068.02	02-1068.02	02-1068.02
Metals Dissolved (7010), mg/l		MTH BLK	LCS	RW-1	RW-3	RW-4
Matrix	Water	Water	Water	Water	Water	Water
Date extracted	Reporting	12/13/04	12/13/04	12/13/04	12/13/04	12/13/04
Date analyzed	Limits	12/13/04	12/13/04	12/13/04	12/13/04	12/13/04
Lead (Pb)	0.002	nd	90%	nd	nd	nd

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

Advanced Analytical Laboratory
(425) 497-0110, fax (425) 497-8089

AAL Job Number:	A41210-1
Client:	Advanced Analytical Labor
Project Manager:	Uwe Baumgartner
Client Project Name:	Lihue Power Plant
Client Project Number:	C403
Date received:	12/10/04

Analytical Results			02-1068.02	Dupl 02-1068.02
Metals Dissolved (7010), mg/l		MTH BLK	D	RW-4
Matrix	Water	Water	Water	Water
Date extracted	Reporting	12/13/04	12/13/04	12/13/04
Date analyzed	Limits	12/13/04	12/13/04	12/13/04
Lead (Pb)	0.002	nd	nd	nd

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

544 OHOHIA STREET, HONOLULU, HAWAII 96819 TEL (808) 836-2252 FAX (808) 836-2250

TURNAROUND TIME: STND

AAL PROJECT#: CH03

METHOD 5035 NEEDED: YES/(NO)

CLIENT: BEI Environmental Services	LOCATION: Lihue Power Plant
ADDRESS: 311 B Pacific St., Honolulu, HI	COLLECTOR: S. Mandina
PHONE: 535-6055 FAX: 535-6053	DATE OF COLLECTION: 12-8-04
CLIENT PROJECT#: 02-1068.02	PROJECT MANAGER: S. Mandina

Sample Number	Depth	Time	Sample type	Container Type	8015B TPH Fuel Scan	8015B TPH Gasoline	8015B TPH Diesel	8015B TPH Oil	8021B BTEX	8021B MBE	8100 PAH DOH 4	8100 PAH 16 analytes	8082 PCB	Total Lead	Total Cadmium	Total Chromium	Total RCRA 8 Metals	8260B Volatiles	8270 Semi Volatiles	8021B HVOC	Field Notes	Total Number of Containers	Total Number received
02-1068.02-RW-1	N/A	1340	W	1 L amber plastic, 250 vials		X		X		X			X								Field filtered	5	
02-1068.02-RW-3	N/A	1220	W			X		X		X			X								for lead	5	
02-1068.02-RW-4	N/A	1500	W			X		X		X			X									5	
02-1068.02-D	N/A	1515	W			X		X		X			X									5	

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	12-9-04 0826	[signature]	12/9/04 3:30
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	20
CHAIN OF CUSTODY SEALS INTACT	~~YES~~ NA
RECEIVED IN GOOD CONDITION	YES
TEMPERATURE	3.1°C
PAGE 1 OF 1	

LABORATORY NOTES: