LANL Report/02

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: January 22, 2002
In Reply Refer To: ESH-18/WQ&H:02-016
Mail Stop: K497
Telephone: (505) 667-7969

Ms. Phyllis Bustamante
Ground Water Pollution Prevention Section
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

ENTERED

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, GROUND WATER DISCHARGE PLAN ANNUAL REPORT FOR 2001, SANITARY WASTEWATER SYSTEMS (SWS) FACILITY (DP-857)

Dear Ms. Bustamente:

The enclosed report and attachments are Los Alamos National Laboratory's Annual Report for the Sanitary Wastewater Systems (SWS) Facility's Ground Water Discharge Plan (DP-857) for 2001. In addition to satisfying the annual reporting requirements under DP-857, the enclosed report also contains the quarterly monitoring data required by DP-857.

If you have any questions regarding this Ground Water Discharge Plan Annual Report for 2001 please call me at (505) 667-7969.

Sincerely,

Bob Beers
Water Quality and Hydrology Group

BB/am

8203

Enclosures: a/s

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E. Hoth, FWO-UI, w/enc., MS K718
WQ&H File, w/enc., MS K497
IM-5, w/enc., MS A150

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GROUND WATER DISCHARGE PLAN (DP-857) ANNUAL REPORT, 2001

for the

SANITARY WASTEWATER SYSTEMS (SWS) FACILITY

LOS ALAMOS
NATIONAL LABORATORY

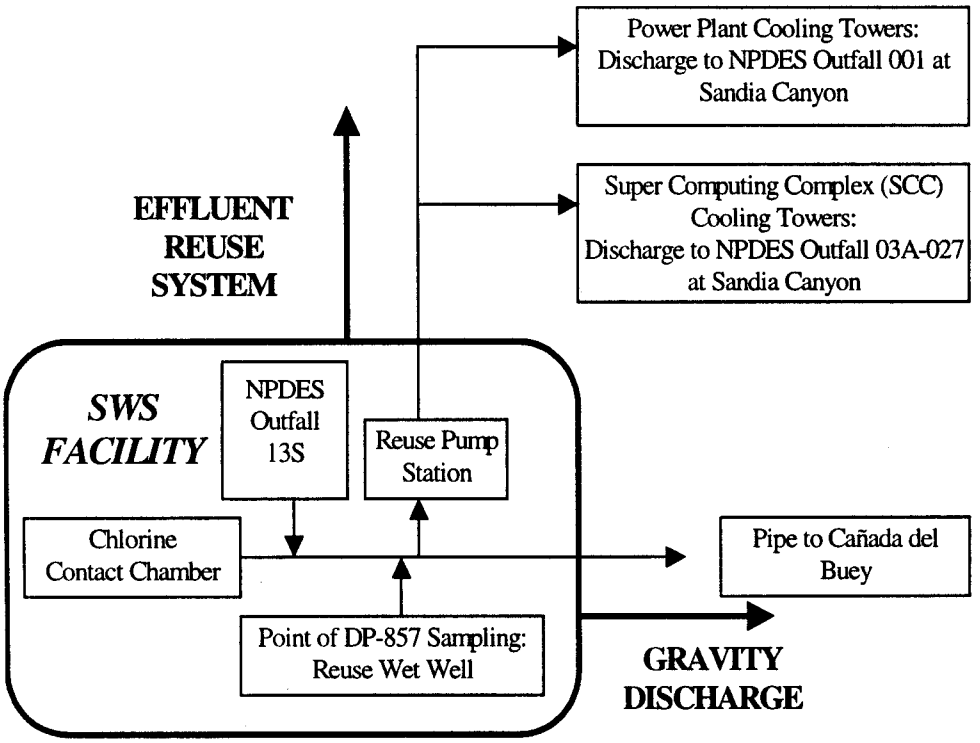
January 22, 2002

INTRODUCTION

Sanitary wastewater generated at Los Alamos National Laboratory (Laboratory) is treated at the TA-46 Sanitary Wastewater Systems (SWS) Facility [formerly the TA-46 Sanitary Wastewater Systems Consolidation (SWSC) Plant]. Effluent from the SWS Facility may be discharged through NPDES Outfall 13S by gravity to Cañada del Buey or pumped via an effluent reuse system up to TA-3 to supply make-up water for the Laboratory's Power Plant and Super Computing Complex (SCC) Facility cooling towers (See **Figure 1**.). To date, all SWS Facility effluent has been pumped to the effluent reuse system, none has been discharged to Cañada del Buey.

On November 1, 2001, the Laboratory submitted a Minor Modification (ESH-18/WQ&H:01-371) to the NMED, Ground Water Quality Bureau, for DP-857. The modification provided notification of the following two changes in the reuse system: (1) Beginning in November 2001 the recently constructed SCC Facility will use SWS Facility effluent in their cooling towers, and (2) discharges from the SCC cooling towers will be discharged a NPDES Permitted Outfall 03A-027 in Sandia Canyon. In summary, under current operations, all SWS Facility effluent reused by the Power Plant and the SCC Facility cooling towers is being discharged at NPDES Outfalls 001 and 03A-027 in Sandia Canyon, respectively.

Figure 1. Effluent Reuse System Schematic



SWS FACILITY DISCHARGES TO CAÑADA DEL BUEY

During 2001, no effluent discharges were made by the SWS Facility into Cañada del Buey. Except for SWS Facility irrigation water used on site at TA-46, all treated effluent was delivered by a force main to TA-3 for reuse in cooling towers or discharge to Sandia Canyon.

EFFLUENT IRRIGATION AT THE SWS FACILITY

During the months of April through October 2001, effluent from the SWS Facility was re-used to irrigate approximately 1/3 acre of turf grass on the facility's grounds. Distribution of the reuse water is controlled though an automatic sprinkler system.

4th QUARTER 2001 MONITORING: REUSE WET WELL, OUTFALL 001, CDBO-6

Attachment 1.0, **Table 1.0**, presents the analytical results from the 4th quarter monitoring at the SWS Facility's reuse wet well (Note: water in the reuse wet well is representative of reuse pond water), the Power Plant's NPDES Outfall 001, and Cañada del Buey alluvial observation well CDBO-6. All sample results in Table 1.0 are less than New Mexico Water Quality Control Commission (NM WQCC) Regulation 3103 Ground Water Standards. Note that the nitrate/nitrite (as N) result for CDBO-6 was invalidated due to contamination of the sample with nitric acid during sample preservation. CBDO-6 will be resampled during the first quarter of 2002. Copies of the analytical reports for the data in Table 1.0 are in Appendix A.

Attachment 2.0, **Table 2.0**, presents the water level in Cañada del Buey alluvial observation well CDBO-6 during the fourth quarter of 2001.

Attachment 2.0, **Table 3.0**, presents the discharge volumes from the SWS Facility's force main and the Power Plant's NPDES Outfall 001 for the 4th quarter of 2001.

2001 ANNUAL MONITORING: REUSE WET WELL, CDBO-6

Attachment 3.0, **Table 4.0**, presents the analytical results from the annual monitoring of the SWS Facility's reuse water (sampling point: SWS Facility reuse wet well) and Cañada del Buey observation well, CDBO-6. All sample results for inorganics, metals, and radiological constituents were less than NM WQCC Regulation 3103 Ground Water Standards. Copies of the analytical reports are enclosed in Appendix A.

2001 ANNUAL MONITORING: REUSE WET WELL, CDBO-6 (con't)

Attachment 4.0, **Table 5.0**, presents a list of the volatile organic (VOC) and semivolatile organic (SVOC) compounds detected in the SWS Facility's reuse water and at CDBO-6 during 2001. A complete list of VOC and SVOC compounds analyzed for in 2001 are presented in Appendix A.

Four VOCs were detected in the SWS Facility's reuse water in 2001. All four of these compounds, Bromodichloromethane (36.4 µg/L), Dibromochloromethane (30.7 µg/L), Chloroform (20.9 µg/L), and Bromoform (6.1 µg/L), are all common disinfection by-products called trihalomethanes (THMs). No SVOCs were detected in the SWS Facility's reuse water in 2001.

No VOCs or SVOCs were detected in CDBO-6 in 2001.

OPERATIONAL EFFLUENT MONITORING: TOTAL NITROGEN

Attachment 5.0, **Table 6.0**, presents the TKN, Ammonia (NH3-N), Nitrate+Nitrite-N, and Total Nitrogen data for SWS Facility effluent for 2001.

In 2001, the total nitrogen concentration (as N) in the SWS Facility's effluent was below 10 mg/L with the exception of one sample (12.73 mg/L) on September 14, 2001. The average total nitrogen concentration (as N) in the SWS Facility's effluent during 2001 was 4.38 mg/L.

Table 1.0 Water Quality Data for SWS Facility Reuse Water, Power Plant NPDES Outfall 001, and CDBO-6, 4th Quarter, 2001.

Sampling Location	Sample Date	Sample ID No.	TDS (mg/L)	Chloride (mg/L)	NO3/NO2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)
SWS Facility							
SWS Facility Reuse Wet Well[1]	11/16/01	GU01111ESWS	500	121	4.65	0.88	<0.0235
Sandia Canyon							
Power Plant NPDES Outfall 001	11/16/01	GU01111E001	332	39.7	1.31	1.38	<0.0235
Canada del Buey							
CDBO-6	11/7/01	GB01111G6DC	165	15.5	[Result Invalid]	0.26	<0.0235
NM WQCC Regulation 3103 Ground Water Standards (mg/L)			*1000*	*250*	*10*		

Notes:

[1]Water in the reuse wet well is representative of water in the reuse pond.

Result invalid means the result for this analyte is invalid due to sample contamination by nitric acid.

All analytical results by General Engineering Laboratories, Inc., Charleston, SC.

Table 2.0. Water Level in Cañada del Buey Observation Well (CDBO)-6, 4th Quarter 2001.

Location	Date	Water Level† (ft)
CDBO-6	11/7/01	35.01

† Measured in feet from the top of the well casing to the surface of the water.

Table 3.0. Discharge Volumes at SWS Facility Force Main and Power Plant NPDES Outfall 001, 4th Quarter 2001 (in millions of gallons).

Month/Year	SWS Facility Force Main	Power Plant NPDES Outfall 001
October 2001	7.226	13.924
November 2001	7.489	8.413
December 2001	7.330	8.190

Table 4.0 Annual Water Quality Data: Inorganics, Metals, and Radiological Results for SWS Facility Reuse Pond and CDBO-6, 2001.

Sampling Location	Sample Date	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	CN (mg/L)	Cu (mg/L)	F (mg/L)	Fe (mg/L)	Hg (ug/L)	Pb (mg/L)	Mn (mg/L)	Se (mg/L)	SO_4 (mg/L)	Ag (mg/L)	Zn (mg/L)	Gross Alpha (pCi/L)	Ra-226 (pCi/L)	Ra-228 (pCi/L)
SWS Reuse Wet Well[1,5]	11/16/01	<0.0026	0.029	0.0004	0.0014	0.0046	0.0033	0.353	0.032	<0.064	0.0008	0.016	<0.0035	21.3	<0.0007	0.084	0.17 (+/-0.909)[4]	0.691	-0.235
CDBO-6[2]	11/7/01	<0.0026	0.163	0.0012	<0.0006	<0.003	0.0028	0.148	0.313	<0.064	0.003	0.010	0.00431	9.37	<0.0007	0.011	19.3 (+/-2.18)[4]	1.13	0.491
NMWQCC 3103 Ground Water Standards (mg/L)		*0.1*	*1*	*0.01*	*0.05*	*0.2*	*1*	*1.6*	*1*	*2 ug/L*	*0.05*	*0.2*	*0.05*	*600*	*0.05*	*10*	*NA*	*30*[3]	*30*[3]

Notes:

[1] Nonfiltered sample.

[2] Filtered sample.

[3] The standard applies to the combined Radium 226 & Radium 228.

[4] Analytical uncertainty.

[5] Water in the reuse wet well is representative of water in the reuse pond.

"J" Indicates an estimated value. The result is greater than the detection limit, but less than the reporting limit.

Table 5.0. Annual VOC and SVOC Detections for SWS Facility Reuse Water and CDBO-6, 2001.

Sampling Location / Sample Type	Sample Date	VOC and SVOC Detections at Concentrations Greater than the Analytical Laboratory's Detection Limts	Results (ug/L)
SWS Reuse Water			
VOC	11/16/01	Bromodichloromethane[1]	36.4
		Dibromochloromethane[1]	30.7
		Chloform[1]	20.9
		Bromoform[1]	6.1
SVOC	11/16/01	[NONE]	
CDBO-6			
SVOC and VOC	11/7/01	[NONE]	

Notes:
[1]By-products from the disinfection of SWS Facility effluent with MIOX.

Table 6.0 SWS Facility Effluent Nitrogen Data for 2001.

Sample Date	TKN (mg/L)	NH3-N (mg/L)	Nitrate+Nitrite-N (mg/L)	Total Nitrogen[1] (mg/L)
1/4/01	0.85	0.13	0.67	1.52
1/10/01	1.07	0.14	5.14	6.21
1/17/01	1.07	0.13	0.44	1.51
2/6/01	0.87	0.01	0.15	1.02
2/10/01	0.94	0.01	0.08	1.02
2/21/01	0.93	0.01	0.15	1.08
3/7/01	0.94	0.01	1.31	2.25
3/14/01	0.68	0.01	0.43	1.11
3/22/01	0.7	0.01	0.57	1.27
4/4/01	0.99	0.01	0.29	1.28
4/12/01	1.17	0.02	0.38	1.55
4/18/01	0.83	0.01	0.51	1.34
5/2/01	0.83	0.01	0.85	1.68
5/10/01	1.13	0.01	3.84	4.97
5/16/01	0.88	0.01	2.34	3.22
6/5/01	0.8	0.01	3.33	4.13
6/18/01	0.87	0.01	0.41	1.28
7/3/01	0.85	0.01	0.49	1.34
7/11/01	2.82	1.83	3.75	6.57
7/19/01	1.57	0.81	3.9	5.47
8/2/01	0.44	0.05	8.44	8.88
8/8/01	0.13	0.01	3.63	3.76
8/15/01	0.14	0.04	5.95	6.09
9/6/01	0.86	0.02	6.35	7.21
9/14/01	0.93	0.02	11.8	12.73
9/20/01	0.94	0.02	6.5	7.44
10/4/01	1.08	0.02	8.1	9.18
10/11/01	1.03	0.02	4.6	5.63
10/17/01	0.86	0.02	7.8	8.66
10/24/01	0.94	0.02	3.09	4.03
11/7/01	0.69	0.02	0.48	1.17
11/14/01	0.89	0.02	0.75	1.64
11/16/01	1.0	0.02	5.65	6.65
12/5/01	1.0	0.02	6.36	7.36
12/11/01	1.36	0.02	6.4	7.76
12/13/01	1.32	0.02	8.3	9.62
Annual Averages	**0.93**	**0.10**	**3.19**	**4.38**

Notes:

[1]Total nitrogen is the sum of TKN and Nitrate+Nitrite.

APPENDIX A

Table of Contents

1) General Engineering Laboratories Analytical Reports: CDBO-6

-Annual Monitoring 2001: VOC, SVOC
-4th Quarter Monitoring 2001: NO3, NH3, TKN, Cl, TDS
-Annual Monitoring 2001: Metals, Inorganics, Rad

2) General Engineering Laboratories Analytical Report: Power Plant Outfall 001

-4th Quarter Monitoring 2001: NO3, NH3, TKN, Cl, TDS

3) General Engineering Laboratories Analytical Report: SWS Facility Reuse Well

-Annual Monitoring 2001: VOC, SVOC
-4th Quarter Monitoring 2001: NO3, NH3, TKN, Cl, TDS
-Annual Monitoring 2001: Metals, Inorganics, Rad

CDBO-6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J420

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: not dec. _____ Date Analyzed: 11/15/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
107-02-8	Acrolein	10.0	U
75-35-4	1,1-Dichloroethylene	1.0	U
67-64-1	Acetone	5.0	U
76-13-1	Trichlorotrifluoroethane	5.0	U
74-88-4	Iodomethane	5.0	U
75-15-0	Carbon disulfide	5.0	U
75-09-2	Methylene chloride	5.0	U
107-13-1	Acrylonitrile	10.0	U
156-60-5	trans-1,2-Dichloroethylene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	5.0	U
594-20-7	2,2-Dichloropropane	1.0	U
74-97-5	Bromochloromethane	1.0	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
563-58-6	1,1-Dichloropropene	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
71-43-2	Benzene	1.0	U
79-01-6	Trichloroethylene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
74-95-3	Dibromomethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	5.0	U
10061-01-5	cis-1,3-Dichloropropylene	1.0	U
108-10-1	4-Methyl-2-pentanone	5.0	U
108-88-3	Toluene	1.0	U

CDBO-6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J420

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: not dec. _____ Date Analyzed: 11/15/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
10061-02-6	trans-1,3-Dichloropropylene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
142-28-9	1,3-Dichloropropane	1.0	U
591-78-6	2-Hexanone	5.0	U
127-18-4	Tetrachloroethylene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
100-41-4	Ethylbenzene	1.0	U
----------	m,p-Xylenes	2.0	U
95-47-6	o-Xylene	1.0	U
1330-20-7	Xylenes (total)	3.0	U
100-42-5	Styrene	1.0	U
75-25-2	Bromoform	1.0	U
98-82-8	Isopropylbenzene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-86-1	Bromobenzene	1.0	U
103-65-1	n-Propylbenzene	1.0	U
95-49-8	2-Chlorotoluene	1.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	U
106-43-4	4-Chlorotoluene	1.0	U
98-06-6	tert-Butylbenzene	1.0	U
135-98-8	sec-Butylbenzene	1.0	U
99-87-6	4-Isopropyltoluene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
104-51-8	n-Butylbenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U

CDBO-6

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1J420

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: not dec. _____ Date Analyzed: 11/15/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U

FORM I VOA OLM03.0

CDB0-6

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W322

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/28/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Methyl-N-nitrosomethylamin	10.0	U
110-86-1	Pyridine	10.0	U
62-53-3	Aniline	10.0	U
108-95-2	Phenol	10.0	U
111-44-4	bis(2-Chloroethyl) ether	10.0	U
95-57-8	2-Chlorophenol	10.0	U
541-73-1	1,3-Dichlorobenzene	10.0	U
106-46-7	1,4-Dichlorobenzene	10.0	U
100-51-6	Benzyl alcohol	10.0	U
95-50-1	1,2-Dichlorobenzene	10.0	U
108-60-1	bis(2-Chloroisopropyl)ether	10.0	U
95-48-7	o-Cresol	10.0	U
621-64-7	N-Nitrosodipropylamine	10.0	U
106-44-5	m,p-Cresols	10.0	U
67-72-1	Hexachloroethane	10.0	U
98-95-3	Nitrobenzene	10.0	U
78-59-1	Isophorone	10.0	U
88-75-5	2-Nitrophenol	10.0	U
105-67-9	2,4-Dimethylphenol	10.0	U
111-91-1	bis(2-Chloroethoxy)methane	10.0	U
120-83-2	2,4-Dichlorophenol	10.0	U
65-85-0	Benzoic acid	20.0	U
120-82-1	1,2,4-Trichlorobenzene	10.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	10.0	U
87-68-3	Hexachlorobutadiene	10.0	U
59-50-7	4-Chloro-3-methylphenol	10.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10.0	U
88-06-2	2,4,6-Trichlorophenol	10.0	U
95-95-4	2,4,5-Trichlorophenol	10.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	o-Nitroaniline	10.0	U

CDBO-6

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W322

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/28/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	m-Nitroaniline	10.0	U
131-11-3	Dimethylphthalate	10.0	U
606-20-2	2,6-Dinitrotoluene	10.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20.0	U
132-64-9	Dibenzofuran	10.0	U
121-14-2	2,4-Dinitrotoluene	10.0	U
84-66-2	Diethylphthalate	10.0	U
100-02-7	4-Nitrophenol	10.0	U
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenylphenylether	10.0	U
534-52-1	2-Methyl-4,6-dinitrophenol	10.0	U
100-01-6	p-Nitroaniline	10.0	U
122-39-4	Diphenylamine	10.0	U
122-66-7	1,2-Diphenylhydrazine	10.0	U
101-55-3	4-Bromophenylphenylether	10.0	U
118-74-1	Hexachlorobenzene	10.0	U
87-86-5	Pentachlorophenol	10.0	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	Di-n-butylphthalate	10.0	U
206-44-0	Fluoranthene	1.0	U
92-87-5	Benzidine	50.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	10.0	U
56-55-3	Benzo(a)anthracene	1.0	U
91-94-1	3,3'-Dichlorobenzidine	10.0	U
218-01-9	Chrysene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	0.72	JB
117-84-0	Di-n-octylphthalate	10.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U

CDBO-6

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GB01111G6DC

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 51777

Matrix: (soil/water) WATER Lab Sample ID: 51777002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W322

Level: (low/med) LOW Date Received: 11/09/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/12/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/28/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenzo(a,h)anthracene	1.0	U
191-24-2	Benzo(ghi)perylene	1.0	U
109-06-8	2-Picoline	10.0	U

CDBO-6

General Engineering Laboratories

TOTAL METALS
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

SDG No.: 51777 **Method Type:** SW-846

Sample ID: 51777001 **Client ID:** GB01111G6DC FILTERED

Contract: ESHL00801 **Lab Code:** GEL **Case No.:** GEL **SAS No.:**

Matrix: WATER **Date Received:** 11/9/2001 **Level:** LOW **% Solids:** 0.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2.600	µg/L	U		P	2.600	TJA61 Trace ICP2	120501
7440-39-3	Barium	163	µg/L			P	0.248	TJA61 Trace ICP2	120501
7440-43-9	Cadmium	1.170	µg/L		E	MS	0.017	HP ICPMS	01K2913A
7440-47-3	Chromium	0.570	µg/L	U		P	0.570	TJA61 Trace ICP2	120501
7440-50-8	Copper	2.800	µg/L	B		P	1.020	TJA61 Trace ICP2	120501
7439-89-6	Iron	313	µg/L			P	2.240	TJA61 Trace ICP2	120501
7439-92-1	Lead	3.320	µg/L		E	MS	0.011	HP ICPMS	01K2913A
7439-96-5	Manganese	9.960	µg/L	B		P	0.369	TJA61 Trace ICP2	120501
7439-97-6	Mercury	0.064	µg/L	U		AV	0.064	PE CVAA	111401W1Hg
7782-49-2	Selenium	4.310	µg/L	B		P	3.490	TJA61 Trace ICP2	120501
7440-22-4	Silver	0.666	µg/L	U		P	0.666	TJA61 Trace ICP2	120501
7440-66-6	Zinc	10.8	µg/L			P	0.491	TJA61 Trace ICP2	120501

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments:

CDBO-6

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497
Los Alamos, New Mexico 87544

Report Date: December 7, 2001

Contact: Bob Beers
Project: Analysis for Bob Beers

Client Sample ID:	GB01111G6DC FILTERED	Project:	ESHL00801
Sample ID:	51777001	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	07-NOV-01		
Receive Date:	09-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography Federal										
EPA 300.0 Chloride in Liquid										
Chloride		15.5	0.025	0.100	mg/L	1	EOC1 12/06/01	2227	123840	2
Sulfate		9.37	0.062	0.200	mg/L	1				
Solids Analysis Federal										
EPA 160.1 Solids, Dissolved-F										
Total Dissolved Solids		165	5.09	10.0	mg/L		TSM 11/13/01	1456	119870	3
TRAACS Nutrient Analysis Fed										
EPA 350.1 Nitrogen, Ammonia L										
Nitrogen, Ammonia	U	ND	0.0235	0.050	mg/L	1	THL 11/14/01	1444	120178	4
EPA 353.1 Nitrogen, (NO3/NO2										
Nitrogen, Nitrate/Nitrite		9.10	0.069	0.500	mg/L	10	THL 11/14/01	1820	120179	5
Nitrogen, Total Kjeldahl (TKN)										
Nitrogen, Total Kjeldahl		0.260	0.0565	0.100	mg/L	1	THL 11/15/01	1624	119947	6
Wet Chemistry General Federal										
EPA 340.2 Fluoride Federal										
Fluoride		0.148	0.006	0.100	mg/L	1	AL1 11/30/01	1720	123166	7

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1	EPA 350.1 Ammonia Nitrogen Liquid Federa	THL	11/14/01	1444	120178
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	THL	11/14/01	0838	120177
EPA 351.2	EPA 351.2 Total Kjeldahl Nitrogen Federa	THL	11/15/01	1624	119947
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	JM1	11/13/01	1251	119944
SW846 7470A	EPA 7470A Mercury Prep Liquid	ARD	11/13/01	1900	120133
SW846 3005A	ICP-MS 3005 PREP	BCD1	11/26/01	1400	122224
SW846 3005A	ICP-TRACE SW846 3005A	BCD1	11/26/01	1400	122212

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 160.1	

CDBO-6

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497
Los Alamos, New Mexico 87544

Report Date: December 7, 2001

Contact: Bob Beers
Project: Analysis for Bob Beers

Client Sample ID: GB01111G6DC FILTERED
Sample ID: 51777001

Project: ESHL00801
Client ID: ESHL001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
4	EPA 350.1									
5	EPA 353.1									
6	EPA 351.2									
7	EPA 340.2									

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

CDB0-6

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497
Los Alamos, New Mexico 87544

Report Date: December 7, 2001

Contact: Bob Beers
Project: Analysis for Bob Beers

Client Sample ID:	GB01111G6DC	Project:	ESHL00801
Sample ID:	51777002	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	07-NOV-01		
Receive Date:	09-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rapid Flow Analysis Federal										
SW9012A Cyanide, Total Federal										
Cyanide, Total	U	ND	2.89	5.00	ug/L	1	ADF 11/13/01	0910	119811	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C-8270C BNA Appendix 9 Prep Fed	HDB	11/12/01	0715	119684
SW846 8260B	8260B Volatiles In Liquid Federal	LAR	11/15/01	1739	120916
SW846 9010B Prep	SW846 9010B Prep	JM1	11/12/01	1636	119810

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9012A	

Notes:
The Qualifiers in this report are defined as follows :

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UI Uncertain identification for gamma spectroscopy.
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This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

CDBO-6

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497

Los Alamos, New Mexico 87544 — Report Date: December 5, 2001

Contact: Bob Beers

Project: Analysis for Bob Beers

Client Sample ID:	GB01111G6DC	Project:	ESHL00801
Sample ID:	51777002	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	07-NOV-01		
Receive Date:	09-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result		DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow													
GFPC, Gross A/B, liquid													
Alpha		19.3	+/-2.18	1.33	1.32	3.00	pCi/L		AB2	11/28/01	0706	122271	1
Beta		21.4	+/-2.16	2.80	1.17	3.00	pCi/L						
GFPC, Ra228, Liquid													
Radium-228		1.13		0.892	0.306	1.00	pCi/L		AS1	11/28/01	1207	121302	2
Rad Radium-226													
Lucas Cell, Ra226, liquid													
Radium-226		0.491		0.226	0.131	1.00	pCi/L		CAF1	12/04/01	1130	122678	3

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C-8270C BNA Appendix 9 Prep Fed	HDB	11/12/01	0715	119684
SW846 8260B	8260B Volatiles In Liquid Federal	LAR	11/15/01	1739	120916
SW846 9010B Pre	SW846 9010B Prep	JM1	11/12/01	1636	119810

The following Analytical Methods were performed

Method	Description
1	EPA 900.0
2	EPA 904.0
3	EPA 903.1

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
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> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497

Los Alamos, New Mexico 87544
Contact: Bob Beers
Project: Analysis for Bob Beers

Report Date: December 5, 2001

Client Sample ID: GB01111G6DC
Sample ID: 51777002

Project: ESHL00801
Client ID: ESHL001

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch Mtd.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

M. Nuner

Reviewed by

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(843) 556-8171 • Fax (843) 766-1178

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POWER PLANT 001

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 29, 2001

Client Sample ID:	GU01111E001	Project:	ESHL00701
Sample ID:	52259001	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	16-NOV-01		
Receive Date:	17-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 300.0 Chloride in Liquid											
Chloride		39.7	0.050	0.400	mg/L	2	EOC1	12/28/01	0001	126006	2
Sulfate		43.3	0.124	0.800	mg/L	2					
Solids Analysis Federal											
EPA 160.1 Solids, Dissolved-F											
Total Dissolved Solids		332	5.09	10.0	mg/L		TSM	11/20/01	1444	121658	3
TRAACS Nutrient Analysis Fed											
EPA 350.1 Nitrogen, Ammonia L											
Nitrogen, Ammonia	U	ND	0.0235	0.050	mg/L	1	THL	11/26/01	1304	122150	4
EPA 353.1 Nitrogen, (NO3/NO2											
Nitrogen, Nitrate/Nitrite		1.31	0.0069	0.050	mg/L	1	THL	12/07/01	1516	124738	5
Nitrogen, Total Kjeldahl (TKN)											
Nitrogen, Total Kjeldahl		1.38	0.0565	0.100	mg/L	1	THL	11/26/01	1841	121791	6
Wet Chemistry General Federal											
EPA 340.2 Fluoride Federal											
Fluoride		0.324	0.006	0.100	mg/L	1	AL1	11/30/01	1720	123166	7

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1	EPA 350.1 Ammonia Nitrogen Liquid Federa	THL	11/26/01	1304	122150
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	THL	11/26/01	1020	122149
EPA 351.2	EPA 351.2 Total Kjeldahl Nitrogen Federa	THL	11/26/01	1841	121791
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	JM1	11/21/01	0824	121790

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 160.1	
4	EPA 350.1	
5	EPA 353.1	
6	EPA 351.2	
7	EPA 340.2	

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 29, 2001

Client Sample ID: GU01111E001
Sample ID: 52259001

Project: ESHL00701
Client ID: ESHL001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

SWS
REUSE WELL

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1L111

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: not dec. _____ Date Analyzed: 11/26/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	1.0	U
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
107-02-8	Acrolein	10.0	U
75-35-4	1,1-Dichloroethylene	1.0	U
67-64-1	Acetone	7.4	B
76-13-1	Trichlorotrifluoroethane	5.0	U
74-88-4	Iodomethane	5.0	U
75-15-0	Carbon disulfide	5.0	U
75-09-2	Methylene chloride	1.1	JB
107-13-1	Acrylonitrile	10.0	U
156-60-5	trans-1,2-Dichloroethylene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	5.0	U
594-20-7	2,2-Dichloropropane	1.0	U
74-97-5	Bromochloromethane	1.0	U
67-66-3	Chloroform	20.9	
71-55-6	1,1,1-Trichloroethane	1.0	U
563-58-6	1,1-Dichloropropene	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
71-43-2	Benzene	1.0	U
79-01-6	Trichloroethylene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
74-95-3	Dibromomethane	1.0	U
75-27-4	Bromodichloromethane	36.4	
110-75-8	2-Chloroethylvinyl ether	5.0	U
10061-01-5	cis-1,3-Dichloropropylene	1.0	U
108-10-1	4-Methyl-2-pentanone	5.0	U
108-88-3	Toluene	1.0	U

SWS
REUSE WELL

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1L111

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: not dec. _____ Date Analyzed: 11/26/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
10061-02-6	trans-1,3-Dichloropropylene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
142-28-9	1,3-Dichloropropane	1.0	U
591-78-6	2-Hexanone	5.0	U
127-18-4	Tetrachloroethylene	1.0	U
124-48-1	Dibromochloromethane	30.7	
106-93-4	1,2-Dibromoethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
100-41-4	Ethylbenzene	1.0	U
	m,p-Xylenes	2.0	U
95-47-6	o-Xylene	1.0	U
1330-20-7	Xylenes (total)	3.0	U
100-42-5	Styrene	1.0	U
75-25-2	Bromoform	6.1	
98-82-8	Isopropylbenzene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-86-1	Bromobenzene	1.0	U
103-65-1	n-Propylbenzene	1.0	U
95-49-8	2-Chlorotoluene	1.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	U
106-43-4	4-Chlorotoluene	1.0	U
98-06-6	tert-Butylbenzene	1.0	U
135-98-8	sec-Butylbenzene	1.0	U
99-87-6	4-Isopropyltoluene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
104-51-8	n-Butylbenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	0.16	JB
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U

SWS
REUSE WELL

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 1L111

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: not dec. _____ Date Analyzed: 11/26/01

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.0	U

SWS
REUSE WELL

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W524

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/21/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Methyl-N-nitrosomethylamin	10.0	U
110-86-1	Pyridine	10.0	U
62-53-3	Aniline	10.0	U
108-95-2	Phenol	10.0	U
111-44-4	bis(2-Chloroethyl) ether	10.0	U
95-57-8	2-Chlorophenol	10.0	U
541-73-1	1,3-Dichlorobenzene	10.0	U
106-46-7	1,4-Dichlorobenzene	10.0	U
100-51-6	Benzyl alcohol	10.0	U
95-50-1	1,2-Dichlorobenzene	10.0	U
108-60-1	bis(2-Chloroisopropyl)ether	10.0	U
95-48-7	o-Cresol	10.0	U
621-64-7	N-Nitrosodipropylamine	10.0	U
106-44-5	m,p-Cresols	10.0	U
67-72-1	Hexachloroethane	10.0	U
98-95-3	Nitrobenzene	10.0	U
78-59-1	Isophorone	10.0	U
88-75-5	2-Nitrophenol	10.0	U
105-67-9	2,4-Dimethylphenol	10.0	U
111-91-1	bis(2-Chloroethoxy)methane	10.0	U
120-83-2	2,4-Dichlorophenol	10.0	U
65-85-0	Benzoic acid	13.3	J
120-82-1	1,2,4-Trichlorobenzene	10.0	U
91-20-3	Naphthalene	0.12	J
106-47-8	4-Chloroaniline	10.0	U
87-68-3	Hexachlorobutadiene	10.0	U
59-50-7	4-Chloro-3-methylphenol	10.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10.0	U
88-06-2	2,4,6-Trichlorophenol	10.0	U
95-95-4	2,4,5-Trichlorophenol	10.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	o-Nitroaniline	10.0	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W524

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 11/21/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	m-Nitroaniline	10.0	U
131-11-3	Dimethylphthalate	10.0	U
606-20-2	2,6-Dinitrotoluene	10.0	U
208-96-8	Acenaphthylene	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20.0	U
132-64-9	Dibenzofuran	10.0	U
121-14-2	2,4-Dinitrotoluene	10.0	U
84-66-2	Diethylphthalate	10.0	U
100-02-7	4-Nitrophenol	10.0	U
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenylphenylether	10.0	U
534-52-1	2-Methyl-4,6-dinitrophenol	10.0	U
100-01-6	p-Nitroaniline	10.0	U
122-39-4	Diphenylamine	10.0	U
122-66-7	1,2-Diphenylhydrazine	10.0	U
101-55-3	4-Bromophenylphenylether	10.0	U
118-74-1	Hexachlorobenzene	10.0	U
87-86-5	Pentachlorophenol	10.0	U
85-01-8	Phenanthrene	0.14	J
120-12-7	Anthracene	0.13	J
84-74-2	Di-n-butylphthalate	10.0	U
206-44-0	Fluoranthene	1.0	U
92-87-5	Benzidine	50.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	10.0	U
56-55-3	Benzo(a)anthracene	1.0	U
91-94-1	3,3'-Dichlorobenzidine	10.0	U
218-01-9	Chrysene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	1.5	J
117-84-0	Di-n-octylphthalate	5.5	J
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GU01111ESWS

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 52259

Matrix: (soil/water) WATER Lab Sample ID: 52259002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 5W524

Level: (low/med) LOW Date Received: 11/17/01

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/21/01

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/01

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	U
53-70-3	Dibenzo(a,h)anthracene	1.0	U
191-24-2	Benzo(ghi)perylene	1.0	U
109-06-8	2-Picoline	10.0	U

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Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 29, 2001

Client Sample ID:	GU01111ESWS	Project:	ESHL00701
Sample ID:	52259002	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	16-NOV-01		
Receive Date:	17-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography Federal											
EPA 300.0 Chloride in Liquid											
Sulfate		21.3	0.062	0.200	mg/L	1	EOC1	12/13/01	1548	126006	1
Chloride		121	0.250	2.00	mg/L	10	EOC1	12/19/01	2241	126006	2
Rapid Flow Analysis Federal											
SW9012A Cyanide, Total Federal											
Cyanide, Total	J	4.61	2.89	5.00	ug/L	1	ADF	11/26/01	1637	122016	3
Solids Analysis Federal											
EPA 160.1 Solids, Dissolved-F											
Total Dissolved Solids		500	5.09	10.0	mg/L		TSM	11/20/01	1444	121658	4
TRAACS Nutrient Analysis Fed											
EPA 350.1 Nitrogen, Ammonia L											
Nitrogen, Ammonia	U	ND	0.0235	0.050	mg/L	1	THL	11/26/01	1304	122150	5
EPA 353.1 Nitrogen, (NO3/NO2											
Nitrogen, Nitrate/Nitrite		4.65	0.0345	0.250	mg/L	5	THL	12/07/01	1556	124738	6
Nitrogen, Total Kjeldahl (TKN)											
Nitrogen, Total Kjeldahl		0.880	0.0565	0.100	mg/L	1	THL	11/26/01	1841	121791	7
Wet Chemistry General Federal											
EPA 340.2 Fluoride Federal											
Fluoride		0.353	0.006	0.100	mg/L	1	AL1	11/30/01	1720	123166	8

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C-8270C BNA Appendix 9 Prep Fed	AD1	11/21/01	1549	121691
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	11/26/01	1337	122218
EPA 350.1	EPA 350.1 Ammonia Nitrogen Liquid Federa	THL	11/26/01	1304	122150
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	THL	11/26/01	1020	122149
EPA 351.2	EPA 351.2 Total Kjeldahl Nitrogen Federa	THL	11/26/01	1841	121791
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	JM1	11/21/01	0824	121790
SW846 7470A	EPA 7470A Mercury Prep Liquid	ARD	11/27/01	1830	122353
SW846 3005A	ICP-MS 3005 PREP	BCD1	12/03/01	1130	123534
SW846 3005A	ICP-TRACE SW846 3005A	FDG	11/27/01	1400	122332
SW846 9010B Prep	SW846 9010B Prep	JM1	11/26/01	1348	122015

The following Analytical Methods were performed

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Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 29, 2001

Client Sample ID: GU01111ESWS
Sample ID: 52259002

Project: ESHL00701
Client ID: ESHL001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	SW846 9012A	
4	EPA 160.1	
5	EPA 350.1	
6	EPA 353.1	
7	EPA 351.2	
8	EPA 340.2	

Notes:
The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

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General Engineering Laboratories

TOTAL METALS
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

SDG No.: 52259 **Method Type:** SW-846

Sample ID: 52259002 **Client ID:** GU01111ESWS

Contract: ESHL00701 **Lab Code:** GEL **Case No.:** GEL **SAS No.:**

Matrix: WATER **Date Received:** 11/17/01 **Level:** LOW **% Solids:** 0.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2.600	µg/L	U		P	2.600	TJA61 Trace ICP2	112701
7440-39-3	Barium	28.9	µg/L			P	0.248	TJA61 Trace ICP2	112701
7440-43-9	Cadmium	0.360	µg/L	B		MS	0.017	HP ICPMS	01L0807A
7440-47-3	Chromium	1.380	µg/L	B		P	0.570	TJA61 Trace ICP2	112701
7440-50-8	Copper	3.300	µg/L	B		P	1.020	TJA61 Trace ICP2	112701
7439-89-6	Iron	32.2	µg/L	B		P	2.240	TJA61 Trace ICP2	112701
7439-92-1	Lead	0.790	µg/L	B		MS	0.011	HP ICPMS	01L0718A
7439-96-5	Manganese	16.4	µg/L			P	0.369	TJA61 Trace ICP2	112701
7439-97-6	Mercury	0.064	µg/L	U		AV	0.064	PE CVAA	112801w1Hg
7782-49-2	Selenium	3.490	µg/L	U		P	3.490	TJA61 Trace ICP2	112701
7440-22-4	Silver	0.666	µg/L	U		P	0.666	TJA61 Trace ICP2	112701
7440-66-6	Zinc	84.4	µg/L			P	0.491	TJA61 Trace ICP2	112701

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments:

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Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 11, 2001

Client Sample ID:	GU01111ESWS	Project:	ESHL00701
Sample ID:	52259002	Client ID:	ESHL001
Matrix:	Ground Water		
Collect Date:	16-NOV-01		
Receive Date:	17-NOV-01		
Collector:	Client		

Parameter	Qualifier	Result		DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow													
GFPC, Gross A/B, liquid													
Alpha		0.170	+/-0.909	1.56	0.464	3.00	pCi/L		AB2	11/28/01	0706	122271	1
Beta		12.9	+/-1.72	2.27	0.911	3.00	pCi/L						
GFPC, Ra228, Liquid													
Radium-228		-0.235		1.17	0.312	1.00	pCi/L		AS1	12/04/01	1243	122252	2
Rad Radium-226													
Lucas Cell, Ra226, liquid													
Radium-226		0.691		0.513	0.222	1.00	pCi/L		CAF1	12/04/01	1130	122678	3

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3510C	3510C-8270C BNA Appendix 9 Prep Fed	AD1	11/21/01	1549	121691
SW846 8260B	8260B Volatiles In Liquid Federal	RMB	11/26/01	1337	122218
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EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	THL	11/26/01	1020	122149
EPA 351.2	EPA 351.2 Total Kjeldahl Nitrogen Federa	THL	11/26/01	1841	121791
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	JM1	11/21/01	0824	121790
SW846 7470A	EPA 7470A Mercury Prep Liquid	ARD	11/27/01	1830	122353
SW846 3005A	ICP-MS 3005 PREP	BCD1	12/03/01	1130	123534
SW846 3005A	ICP-TRACE SW846 3005A	FDG	11/27/01	1400	122332
SW846 9010B Pre	SW846 9010B Prep	JM1	11/26/01	1348	122015

The following Analytical Methods were performed

Method	Description
1	EPA 900.0
2	EPA 904.0
3	EPA 903.1

Notes:
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** Indicates the analyte is a surrogate compound.
< Actual result is less than amount reported

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Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Groundwater

Report Date: December 11, 2001

Client Sample ID: GU01111ESWS
Sample ID: 52259002

Project: ESHL00701
Client ID: ESHL001

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	AnalystDate	Time	Batch Mtd.

> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
E Concentration exceeds instrument calibration range
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the compound was analyzed for but not detected above the detection limit
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M. Moore

Reviewed by

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