



GLENN SPRINGS HOLDINGS, INC.

MILLER SPRINGS REMEDIATION MANAGEMENT, INC.

2001 OPERATION AND MONITORING REPORT SEVENTH YEAR

**Love Canal
Occidental Chemical Corporation
Niagara Falls, New York**

**2001 OPERATION/MONITORING REPORT
OCCIDENTAL CHEMICAL CORPORATION
LOVE CANAL
NIAGARA FALLS, NEW YORK**

Miller Springs Remediation Management, Inc.

Glenn Springs Holdings, Inc.

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1.0 INTRODUCTION

Operation of the Love Canal Site (Site) was transferred from the New York State Department of Environmental Conservation (NYSDEC) to Occidental Chemical Corporation (OxyChem) in April 1995.

Effective July 1, 1998, Site responsibility was assigned by OxyChem to Miller Springs Remediation Management, Inc. (MSRM), a Glenn Springs Holdings, Inc. (GSHI) affiliate. GSHI is a subsidiary of Occidental Petroleum Corporation. This report is the seventh annual report prepared by or on behalf of OxyChem and covers operating and monitoring activities for 2001.

2.0 REMEDIAL SYSTEMS

Operation of remedial systems to prevent the off-Site migration of chemical contaminants from the Site began in October 1978 with the installation of a barrier drain along the east and west sides of the south section of the Canal; the barrier drain was later extended to completely encompass the Canal. The barrier drain, designed to intercept the shallow lateral groundwater flow, consists of a trench 15 to 25 feet deep and 4 feet wide. Installed within the trench is an 8-inch diameter perforated clay tile drain centered in 2 feet of uniformly sized gravel which is overlain to the surface with sand. Lateral trenches filled with sand were excavated perpendicular to the barrier drain in the direction of the canal. The tile drain is graded toward a series of manholes and wet wells (PC-1A/PC-2A North/Central and PC-1/PC-2 South) where the leachate is collected. The leachate is pumped from the wet wells to two underground holding tanks (PC-3A North/Central and PC-3 South) where it is held prior to being treated at the on Site treatment facility and discharged into the City of Niagara Falls (City) sanitary sewer system.

2.1 OPERATIONS OF THE BARRIER DRAIN AND WELL COLLECTION SYSTEMS

2.1.1 Barrier Drain System

There was no major maintenance performed on the Barrier Drain system during the year. The system functioned without any problems or irregularities. A slight build-up of debris (rocks and sludge) was found in Manhole 6B (Second Manhole North of PC2A) within the Northwest section of the collection system. The manhole was cleaned of debris and the drains entering the manhole were flushed.

2.1.2 Wet Well Collection System

The collection well system consists of two sectors, the Northern/Central and the Southern Collection System. The collection systems were operational and functioned properly throughout the year.

The adjacent 102nd Street Landfill Site leachate line connection into the Love Canal Treatment Facility (LCTF) at the southern storage tank (PC3) was completed in March of 1999. This provides for treatment of the 102nd Street leachate through the LCTF.

3.0 GROUNDWATER TREATMENT AND MONITORING

3.1 GROUNDWATER TREATMENT

3.1.1 Treatment System

The treatment system consists of clarification, bag filtration, and carbon treatment prior to discharge to the City sanitary sewer system under permit #44 issued by the City. The City reissued the wastewater discharge permit to OxyChem on January 6, 2000; the permit has a 5 year term and will be up for renewal in 2005.

No carbon bed changes were performed in 2001, however an internal visual inspection of the Carbon Transfer Bed (V3) was performed. Several routine maintenance activities were performed; a list of the major activities is presented in bullet form below (see attached Table 4.1 for a detailed list of Site activities for the year 2001):

- Upgraded PC3, PC3A, PC1A and the Influent flow meters.
- Replaced the bearing on the Treatment Building exhaust fan.
- The Treatment Building process floor was prepped and re-coated with a water-based epoxy paint.

3.1.2 Effluent Discharge

The LCTF discharged to the Niagara Falls sanitary sewer system on 215 days in 2001. Unusually high rainfall in the area around Love Canal can result in surcharged sewers. The surcharge leads to overflow at the combined sanitary and storm sewer overflow points. Other points in the sewer shed require manual bypass pumping. Consequently, to minimize this overflow, the City of Niagara Falls requires the LCTF to cease discharge during these surcharge events. For the year, one request from the City to stop discharging occurred. Groundwater treated at the Love Canal Leachate Treatment Facility was as follows:

- Total treated at LCTF (including 102nd Street): 4,277,500 gallons
- Pumped from 102nd Street Site: 1,023,152 gallons
- Net Love Canal Collection: 3,254,348 gallons

Table 3.1 shows the monthly total and average treated groundwater quantities for the 1995 to 2001 periods. Additionally, starting with 2000, the total days of discharge per month are shown.

In March of 1999, the adjacent 102nd Street Landfill Site leachate collection system was connected to the Love Canal Site to transfer the 102nd Street leachate into the Love Canal southern storage system (PC3). For the year, the four-well system at 102nd Street pumped 1,023,152 gallons to Love Canal (PC3), when it was then treated along with groundwater accumulated on the Site.

3.1.3 Sampling

Sampling of the effluent discharge to City's sanitary sewer system occurred quarterly as required under the City of Niagara Falls Discharge Permit #44. As part of the permit requirements, City and MSRM personnel completed an annual verification sampling. The Quarterly Effluent sampling was performed and sample results were submitted to the City and State agencies; analytical results were below City's permitted limits for all sampled parameters during all events.

3.1.4 Precipitation

Precipitation in the Niagara Falls region totaled 35.18 inches (Buffalo Airport, National Weather Service data), compared to the average of 39.74 inches (1995 through 2000). This resulted in decreased infiltration into the shallow overburden groundwater system. Table 3.1 provides historic precipitation data.

3.2 GROUNDWATER MONITORING

3.2.1 Groundwater Quality

Sampling and analytical protocols for the sampling program have been established and are set forth in the “Sampling Manual, Love Canal Site, Long-Term Groundwater Monitoring Program” (January 1996).

3.2.2 Chemical Monitoring

The 2001 chemical sampling event was performed during the second quarter; forty-two (42) groundwater samples were collected (thirty-nine (39) wells, and three duplicates). Additionally, one field blank and two rinse blanks were taken during the sampling event. Five NYSDEC split samples were obtained. Well 3151 was on rotation to be sampled as part of the 2001 Long-term Groundwater Monitoring Program, however the well was unable to be located and deemed unrecoverable by NYSDEC representative Brian Sadowski. Well 3157 was used as an alternate, in is located within the same proximity as 3151. Figure 3.1 identifies the wells sampled and their locations. Table 3.2 provides a summary of the wells (21 overburden and 18 bedrock) selected by the NYSDEC for the Long-Term Monitoring Program and the number of compounds found at or above detection limits in each.

Thirty-four (34) samples (31 wells and three duplicates) had analytical results above compound detection levels; the data are presented in Table 3.3. Of the thirty-four (34) samples, 12 of the them had a single detection of bis(2-ethylhexyl)phthalate (BEHP). The detection of BEHP was also reported in one of the method blanks. BEHP is a common laboratory contaminant readily leached from plastics. It is routinely detected in the analytical laboratory as an artifact and it is probable that the BEHP reported in the samples is the result of laboratory contamination. There were thirty-five (35) discrete compounds detected: fifteen (15) volatile organic compounds (VOCs), fourteen (14) semi-volatile organic compounds (SVOCs), and six (6) pesticides. The majority of these compounds (thirteen VOCs, eight SVOCs, and six pesticides) were detected in well 10135, which historically has the highest number and concentration of compounds. Well 10135 is located within the boundaries of the remedial Site in the southwestern zone. Table 3.4 presents a summary of

detected compounds of the four long-term monitoring wells (10210A, 10210B, 10210C, and 10135) from 1990 to 2001. This data shows that the compounds detected in 2001 were at similar concentrations to those compounds detected in previous years.

Two rinse blanks and a deionized water blank (field blank) were collected and analyzed with the samples. Generally, field blank results were non-detect with the exception of the following compounds present at low levels: bis(2-ethylhexyl)phthalate, toluene, and carbon disulfide. All sample results with similar concentrations as in the blanks were qualified as non-detect.

H2M Labs Inc., Melville, New York, conducted the sample analyses. Conestoga-Rovers & Associates (CRA), Niagara Falls, New York, performed the analytical Quality Assurance/Quality Control (QA/QC). Both the analytical data and the QA/QC report are on file at the MSRM Western New York Office at Love Canal and are available for review upon request.

The Quality Assurance/Quality Controls (QA/QC) criteria by which these data have been assessed are outlined in:

- Methods 95-1, 95-2 and 95-3 referenced in the NYSDEC Analytical Services Protocol (ASP) (10/95 Rev); and
- “USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review” EPA 540/R-94/012, February 1994.

The QA/QC evaluation concluded all sample results were acceptable, with the exception of the pesticide results for sample 9115, which were rejected due to poor analytical efficiency.

The 2001 chemical analytical results are consistent with previous Long-Term Monitoring analytical results. Detected chemicals were at low levels and do not indicate a failure in the barrier drain or pose an immediate threat to groundwater quality.

3.2.3 Hydraulic Containment

Water levels were measured at six nested piezometer strings (1140, 1150, 1160, 1170, 1180, and 1190) in March, May, August, and November 2001. Figures 3.2 to 3.7, ordered from the well furthest from the outside of the barrier drain to the barrier drain and the well inside the area enclosed by the barrier drain, show the overburden groundwater flow conditions for May 2001 along the six piezometer strings. The water level data are presented in Tables 3.5A to 3.5F.

The groundwater level data shows that groundwater flow in the vicinity of the barrier drain was toward the barrier drain. The barrier drain is drawing groundwater from outside the drain and successfully capturing horizontal groundwater flow from the Site.

4.0 OTHER ACTIVITIES

Summaries of normal activities and repairs performed in 2001 are listed in Table 4.1 (including those items previously mentioned in Section 3.0). A brief description of major activities is presented below.

4.1 PROCESS ACTIVITIES

Activities that occurred during the year included the following:

- MSRM has continued to upgrade the process control system software and programming. A replacement of the process computer was performed. The upgrades provide improved monitoring, logging, and control of the Site collection and treatment plant process parameters.
- Maintenance on the Barrier Drain Collection system as noted in Section 2.1.1.
- Sludge / sediment (classified as non-aqueous phase liquid (NAPL)) recovered from the LCTF clarifier totaled 100 gallons (1000 pounds) and was sent out to a permitted facility for incineration for disposal.

4.2 NON-PROCESS ACTIVITIES

Activities that occurred throughout the year include the following:

- Removal of the former Decon-Pad west of the Administration Building along 95th Street, which included demolition, grading with topsoil and seeding.
- Installed expansion plugs in the abandoned sanitary sewer / line (MH-97.107) on 97th Street (within Site). The manhole was then filled with concrete. Manholes on either end had been decommissioned and filled previously by the NYSDEC.
- Three slight depressions were filled with topsoil and then graded to the existing cap slope.

4.3 COMMUNITY OUTREACH

Community Outreach programs during 2001 included such activities as beautification of the neighborhood and tours of the facility.

4.3.1 Beautification

- Thirty-five (35) acres adjacent to the Site were mowed (as a one-time event) from 100th Street to 102nd Street, spanning from Colvin Blvd. to Frontier Avenue, as part of community outreach and area beautification.
- Planting of 72 trees (Oaks, Pines, and Maples) along the perimeter of the Site, concentrating along 100th Street (East Side of Site).
- Maintenance and landscaping of the Site and surrounding areas.
- Maintenance of flowerbeds and shrubs along Colvin Blvd. and Frontier Avenue.
- Additional flowers and shrubs at front entrance at 95th Street and Read Avenue.
- Cleanup of discarded debris around fence line and adjacent lots.
- Communication with neighbors and local officials on patrol and monitoring for illegal dumping of debris along roadsides.

4.3.2 Tours

Five (5) tours of the facility were given throughout the year to representatives of various environmental agencies (domestic and foreign) and other community groups. The tours included both an informational orientation accompanied with visual aids followed by a guided tour of the treatment facility and landfill. Tours of the facility throughout the year included:

- Trainees of the Western New York Brownfields Training Initiative, a government sponsored program through the University of Buffalo.
- World-Connect, Mr. Cheng Chieh-Sung, Section Chief of the Bureau of Waste Management, Environmental Protection Agency of Taiwan.

- World-Connect: in conjunction with U.S. Department of State's International Visitor Program: Mr. Fereenc Szalay, Mayor of Szolnok, Hungary. Joined by representative from the U.S. State Department and interpreter.
- World-Connect: Hungarian delegates, which included a representative from Europe Center for Nature Conservation, Humusz Hulladek Munkaszovetseg (Waste Management Alliance, NGO), Prime Minister's Office Environmental Advisor, CEVA Hungary Ltd., Environmental Protection Inspectorate of Trans-Tisza Region, and interpreters.
- Several Japanese visitors from the Kansai Power Company which included the Director of Construction, Design Section Manager, Environmental Protection Manager, and Director of Kanasi Environmental Center. Also present, from the Kubota Corp., was the Group Leader of the Environmental Monitoring Group, and interpreter.

4.3.3 Communications

The City of Niagara Falls Fire Department toured the Site (July 31, 2001) and reviewed the Emergency Response Plan; this review included property access, during any emergency responses, layout of Site and location of buildings, storage areas of equipment and reactive materials (gasoline, paints, etc.) and MSRM personnel responders list.

The Annual Report for 2000 was issued to 27 citizens and agencies last year. The report summarizes items such as the amount of groundwater treated on Site and then discharged to City's sanitary sewer, maintenance activities and other non-operational activities for the year.

4.4 WASTE GENERATION

A total of 322,523 pounds of non-hazardous and hazardous waste was generated from various activities on Site. The waste materials (non-hazardous and hazardous) were then sent off-Site for proper disposal in accordance with all applicable laws and regulations (landfilled, incinerated or reclaimed depending on categorization).

4.4.1 Non-Hazardous Waste

A total of 267,270 pounds of non-hazardous waste was generated on Site and sent off-Site for reclamation or to a secured landfill, as follow:

- fluorescent bulbs (30 pounds).
- concrete, blacktop and soil from the decon pad demolition (as described in the bullet item in Section 4.2) (267,240 pounds).

4.4.2 Hazardous Waste

A total of 55,253 pounds of hazardous waste was generated on Site. Of this, 54,913 pounds were sent for incineration and the remainder (340 pounds) was reclaimed or treated. The waste was categorized as follows:

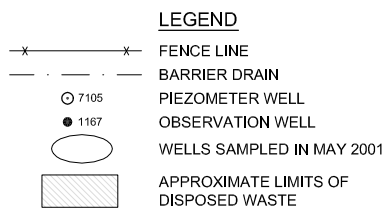
- Spent carbon (from carbon change in 2000) used in the treatment process totaled 49,000 pounds.
- Debris / filters / Personal Protective Equipment (PPE) totaled 4,913 pounds.
- NAPL (sediment / sludge from clarifier cleanout) totaled 1,000 pounds.

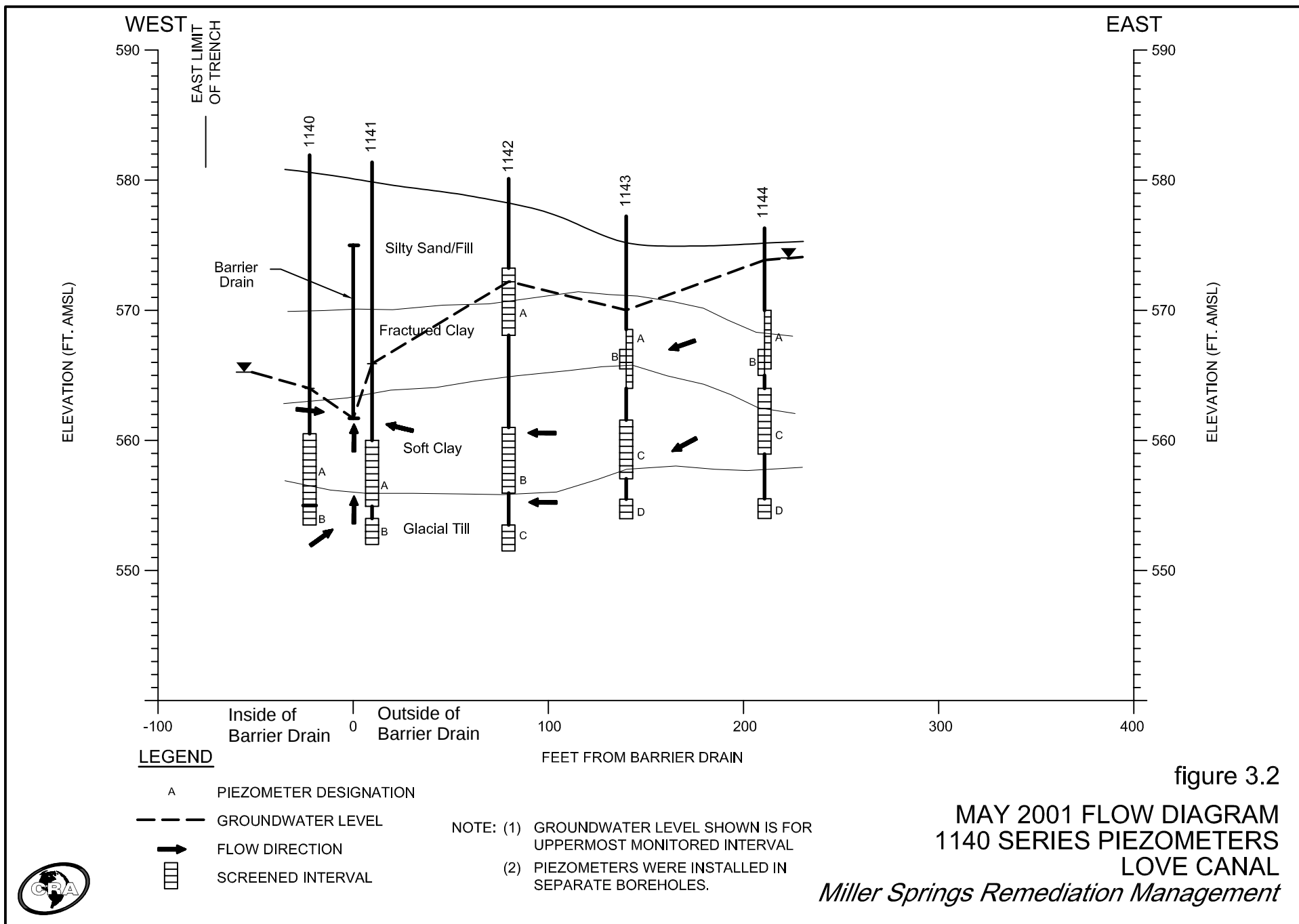
The remainder of the waste (340 pounds) consisted of used motor oil, hydrochloric acid (from prior LCTF operation), discarded samples, and batteries, and was sent out as bulk (drum) or labpacked.

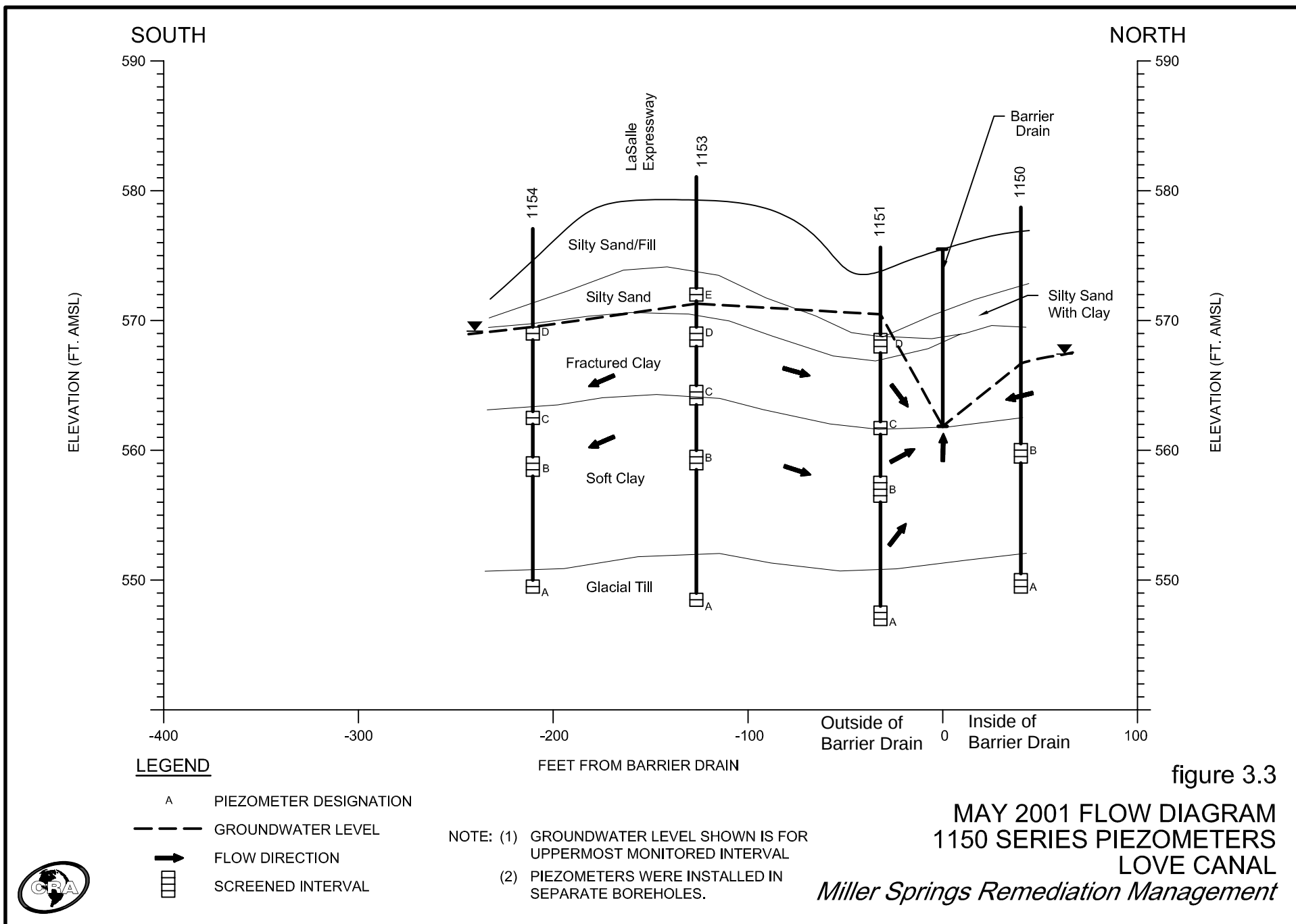
5.0 CONCLUSION

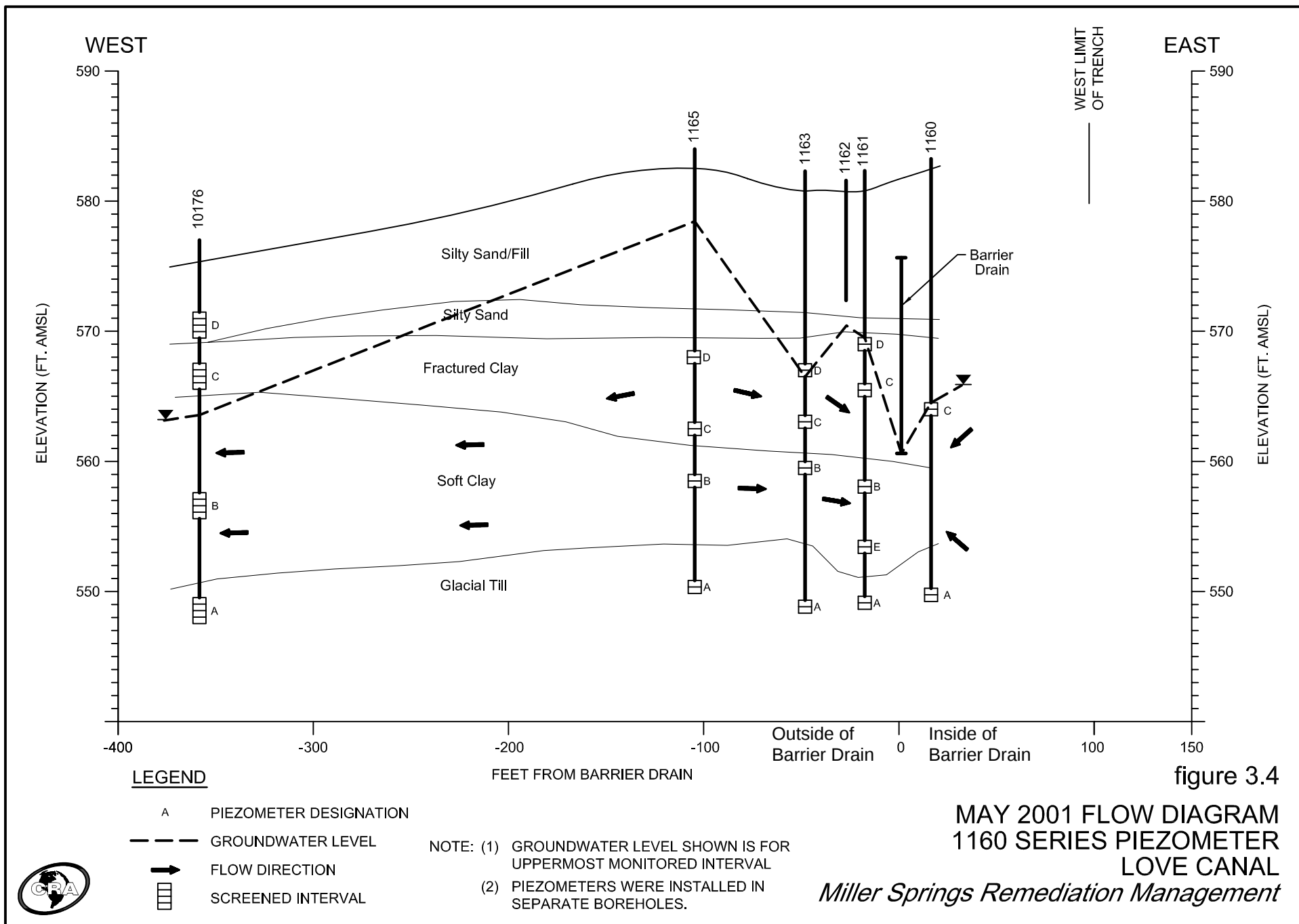
The 2001 data indicate that there was no significant change in chemical and hydrological conditions at the Site. The barrier drain is successfully capturing leachate from the Site and preventing off-Site migration of chemicals. The remediation system is functioning as designed: 4,277,500 gallons of leachate were treated and discharged from the Site, of which 3,254,348 gallons of leachate was collected on-Site and the remaining 1,023,152 gallons pumped from the 102nd Street Site .

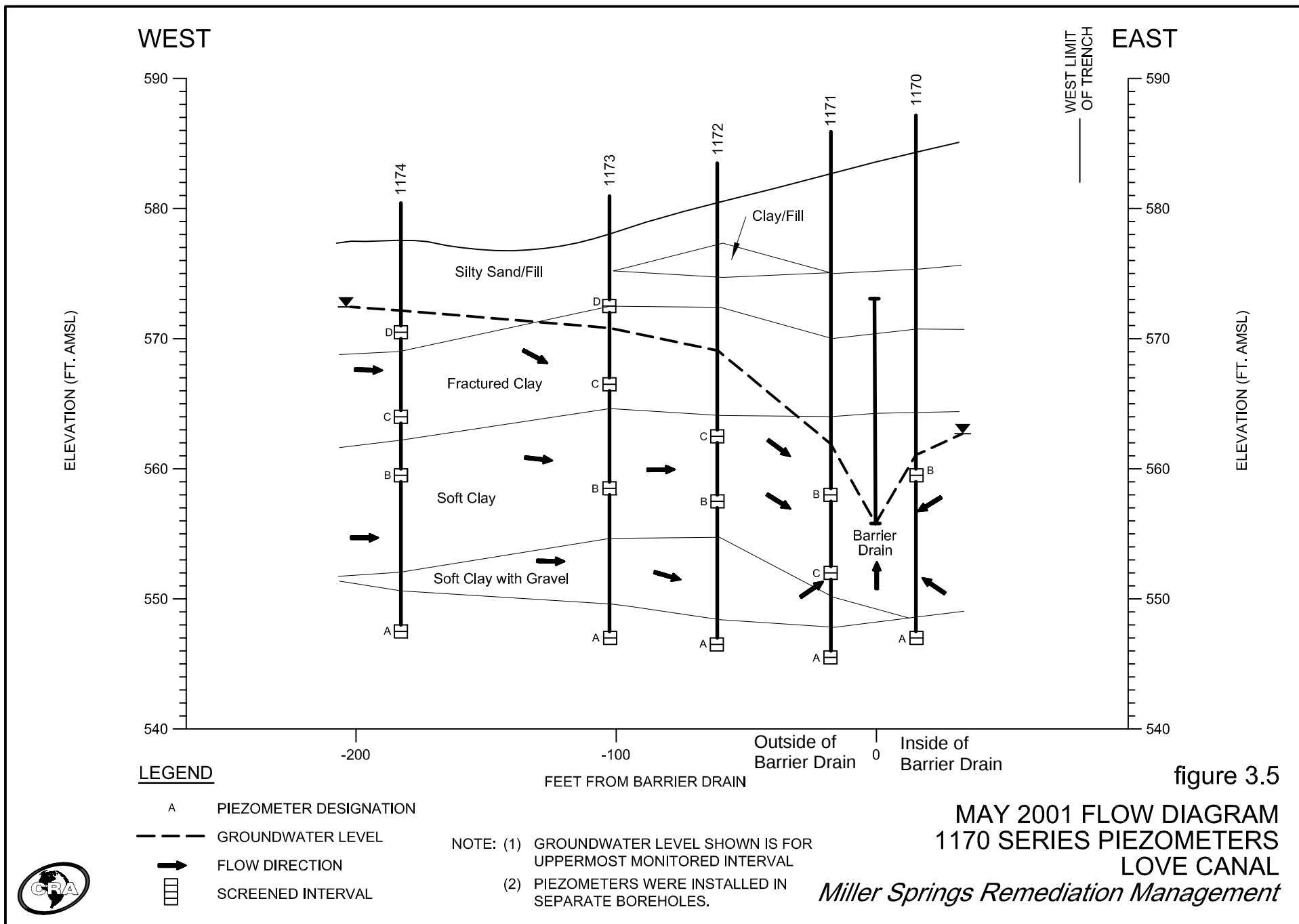
FIGURES

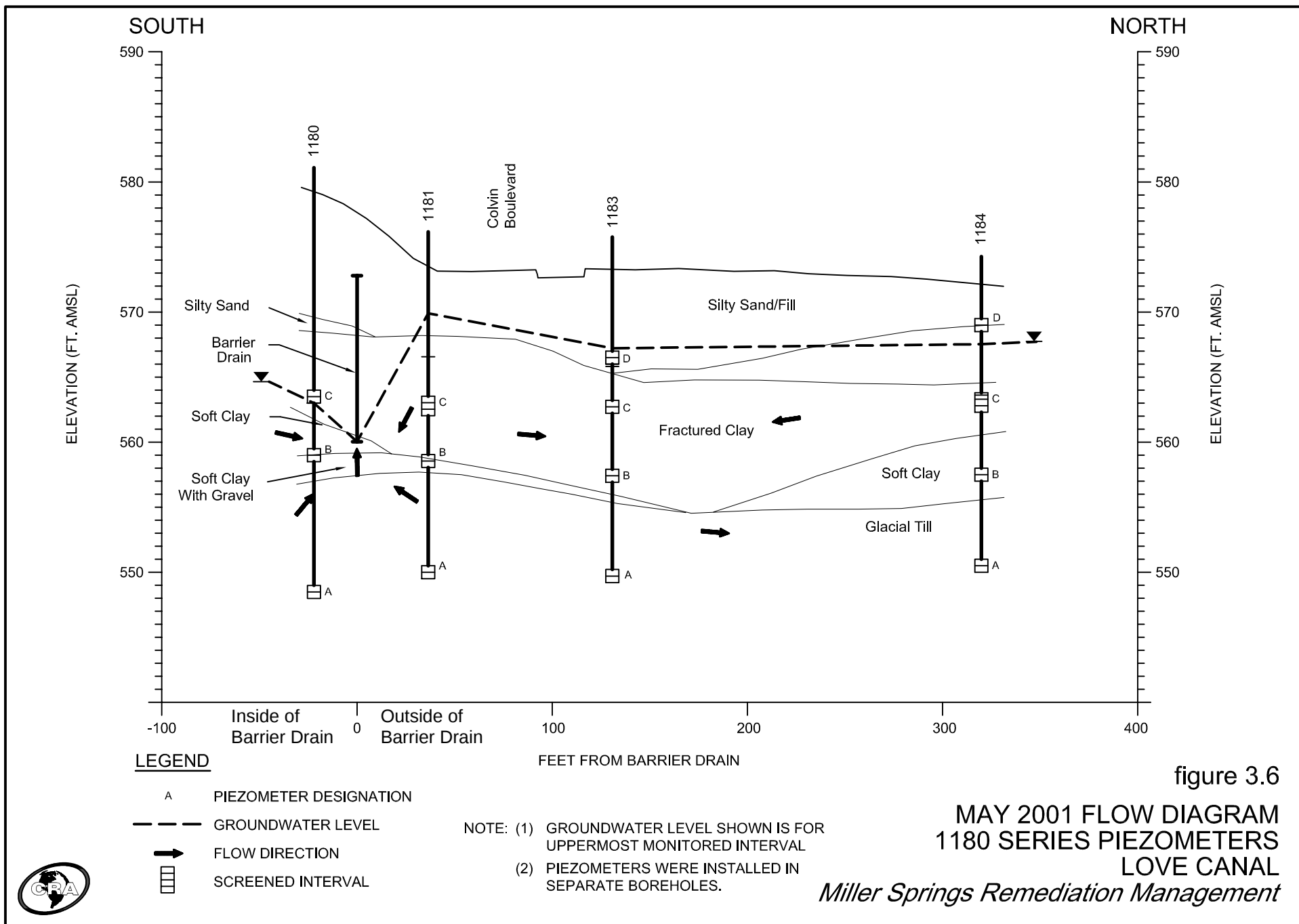












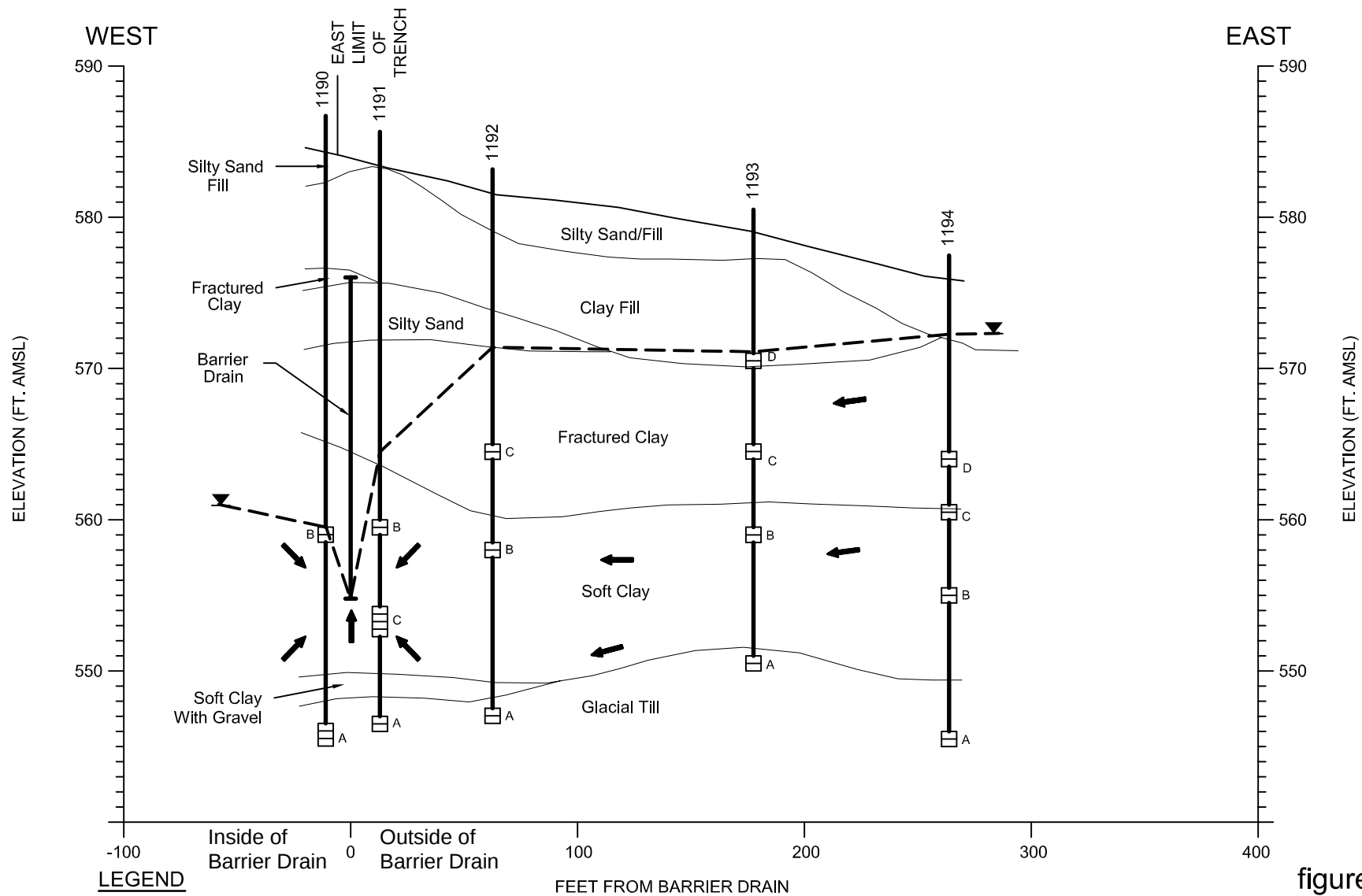


figure 3.7

MAY 2001 FLOW DIAGRAM
1190 SERIES PIEZOMETERS
LOVE CANAL

Miller Springs Remediation Management



TABLES

TABLE 3.1

**MONTHLY VOLUMES OF GROUNDWATER TREATED
LOVE CANAL LEACHATE TREATMENT FACILITY
OCCIDENTAL CHEMICAL CORPORATION**

		<i>Volume (gal)</i>						
		1995	1996	1997	1998	1999	2000	2001
January	Gross ⁽¹⁾	597,650	474,330	337,720	700,070	335,700	495,800	396,900
	Net ⁽²⁾	-	-	-	-	335,700	280,364	282,480
	Days ⁽³⁾	N/A	N/A	N/A	N/A	N/A	21	20
February	Gross	202,235	252,450	456,800	539,838	270,100	480,400	560,000
	Net	-	-	-	-	270,100	368,492	468,863
	Days	N/A	N/A	N/A	N/A	N/A	21	19
March	Gross	385,910	331,690	520,600	615,133	409,300	505,500	616,400
	Net	-	-	-	-	321,558	290,501	493,476
	Days	N/A	N/A	N/A	N/A	N/A	23	21
April	Gross	132,790	615,350	184,400	437,817	555,200	675,600	352,300
	Net	-	-	-	-	296,535	547,926	262,946
	Days	N/A	N/A	N/A	N/A	N/A	20	20
May	Gross	123,140	513,310	126,850	139,600	401,500	473,300	311,200
	Net	-	-	-	-	123,790	335,331	207,580
	Days	N/A	N/A	N/A	N/A	N/A	20	17
June	Gross	125,300	251,400	210,630	99,800	323,500	632,200	202,200
	Net	-	-	-	-	63,658	486,721	132,132
	Days	N/A	N/A	N/A	N/A	N/A	20	16
July	Gross	132,400	113,300	96,810	130,200	143,600	333,900	182,200
	Net	-	-	-	-	104,649	184,955	111,941
	Days	N/A	N/A	N/A	N/A	N/A	20	16
August	Gross	112,910	146,700	223,390	138,300	230,600	437,100	267,200
	Net	-	-	-	-	97,423	286,925	194,821
	Days	N/A	N/A	N/A	N/A	N/A	23	18
September	Gross	111,200	310,550	116,790	95,200	232,100	209,600	144,900
	Net	-	-	-	-	62,759	82,263	81,619
	Days	N/A	N/A	N/A	N/A	N/A	20	16
October	Gross	491,440	532,360	326,100	71,500	283,400	264,300	438,500
	Net	-	-	-	-	175,837	134,248	348,153
	Days	N/A	N/A	N/A	N/A	N/A	20	18
November	Gross	641,210	393,730	346,550	46,200	491,800	250,900	250,400
	Net	-	-	-	-	344,145	132,728	194,481
	Days	N/A	N/A	N/A	N/A	N/A	17	16
December	Gross	235,900	499,540	524,760	73,800	695,500	522,600	555,300
	Net	-	-	-	-	397,912	421,149	475,856
	Days	N/A	N/A	N/A	N/A	N/A	17	18
Total	Gross	3,292,085	4,434,710	3,471,400	3,087,458	4,372,300	5,281,200	4,277,500
	Net	-	-	-	-	2,594,066	3,551,603	3,254,348
	Days	N/A	N/A	N/A	N/A	N/A	242	215
Monthly Average	Gross	274,340	369,560	289,280	257,288	364,358	440,100	356,458
	Net	-	-	-	-	216,172	295,967	271,196
	Days	N/A	N/A	N/A	N/A	N/A	20	18
Rainfall Inches		33.99	48.22	41.17	38.77	34.08	42.2	35.18

NOTES: (1) Gross: Total Treated; As of March 1999 Treatment at LCTF included leachate collected from 102nd Street Landfill Site.
 (2) Net: LC (Love Canal) Treated; Total treated less received from 102nd Street.
 (3) Days: Number of days Treatment Facility discharged to the sanitary sewer.

TABLE 3.2

**SUMMARY OF DETECTED COMPOUNDS
2001 LONG-TERM MONITORING PROGRAM
LOVE CANAL
OCCIDENTAL CHEMICAL CORPORATION**

<i>Overburden Wells</i>	<i>VOCs</i>	<i>SVOCs</i>	<i>Pesticides/PCBs</i>
3157	ND / ND	1 / 1	ND / ND
7120	ND	2	ND
7132	ND	1	ND
8106	ND	1	ND
8110	ND	1	ND
8120	ND	2	ND
8130	ND	1	ND
8140	1	ND	ND
9110	ND	1	ND
9115	ND	1	ND
9118	ND	1	ND
9125	ND	1	ND
10113	1	ND	ND
10135	13 / 13	8 / 11	6 / 6
	15	22	6
<i>Bedrock Wells</i>			
5222	1	ND	ND
6209	1	ND	ND
7205	ND	1	ND
8210	ND	1	ND
9205	ND	1	ND
9210	1	1	ND
10205	2	1	ND
10215	ND	1	ND
10270	ND	1	ND
10272	ND	2	ND
10278	ND	1	ND
10210A	2	ND	ND
10210B	2	1	ND
10210C	1 / 1	ND / ND	ND / ND
10225A	2	ND	ND
10225B	1	ND	ND
10225C	2	1	ND
	14	12	0
Total # of Detections	29	34	6

Notes:

35 - Number of parameters detected.

ND / ND - Duplicate analyses.

ND - No parameters detected at or above detection limits.

TABLE 3.3
ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER SAMPLING
SUMMARY OF COMPOUNDS DETECTED
LOVE CANAL MAY 2001

Sample Location:		10113	10135	10135	10205	10210A	10210B	10210C	10210C	10215	10225A
Sample ID:		LC-10113-501	LC-10135-501	LC-8215-501	LC-10205-501	LC-10210A-501	LC-10210B-501	LC-10210C-501	LC-8225-501	LC-10215-501	LC-10225A-501
Sample Date:		5/11/2001	5/11/2001	5/11/2001	5/15/2001	5/18/2001	5/17/2001	5/17/2001	5/17/2001	5/31/2001	5/18/2001
Parameter	Unit	Duplicate									
Volatiles											
1,1,2,2-Tetrachloroethane	ug /L	10 UJ	100 J	120 J	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ
1,1,2-Trichloroethane	ug /L	10 U	29 J	34 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug /L	10 U	4 J	4 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	ug /L	10 UJ	12 J	11 J	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ
Acetone	ug /L	8 J	69 U	67 U	11 J	10 J	12 J	9 J	6 J	10 U	50 J
Benzene	ug /L	10 U	7600	8500 J	2 J	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	ug /L	10 U	10 U	10 U	6 J	6 J	14	10 U	10 U	10 U	14
Chlorobenzene	ug /L	10 U	2700 J	3000 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform (Trichloromethane)	ug /L	10 U	150 J	160 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug /L	10 U	22 J	24 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug /L	10 U	50 J	61 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug /L	10 U	22000	24000	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug /L	10 U	60 J	59 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug /L	10 U	140 J	180 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	ug /L	10 U	75 J	66 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-Volatiles											
1,2,4-Trichlorobenzene	ug /L	10 U	42 J	65 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	ug /L	10 U	200 U	48 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	ug /L	10 U	69 J	110 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	ug /L	10 U	620 J	1200 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	ug /L	10 U	370 J	550 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	ug /L	10 U	200 U	41 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	ug /L	10 U	86 J	130 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzoic acid	ug /L	0 U	4400 J	6200 J	0 U	0 U	0 U	0 U	0 U	10 U	0 U
Benzyl Alcohol	ug /L	0 U	330 J	630 J	0 U	0 U	0 U	0 U	0 U	10 U	0 U
bis(2-Ethylhexyl)phthalate	ug /L	10 U	200 U	200 U	10 U	10 U	10 U	10 U	10 U	19	12 U
Di-n-butylphthalate	ug /L	10 U	200 U	200 U	3 J	10 U	3 J	10 U	10 U	2 J	10 U
Di-n-octyl phthalate	ug /L	10 U	200 U	200 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	ug /L	10 U	1100	1400	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	ug /L	10 U	200 U	51 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pesticides											
Aldrin	ug /L	0.050 U	0.95 JN	1.5 JN	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
alpha-BHC	ug /L	0.050 U	43 J	50 J	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	ug /L	0.050 U	16 J	16 J	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	ug /L	0.050 U	10 J	12 J	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	ug /L	0.050 U	1.5 JN	1.6 JN	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	ug /L	0.050 U	5.0 J	7.3 J	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

Notes:

- J Estimated.
- N Presumably present.
- R Rejected.
- U Non-detect at associated value.

TABLE 3.3
ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER SAMPLING
SUMMARY OF COMPOUNDS DETECTED
LOVE CANAL MAY 2001

Sample Location:		10225B	10225C	10270	10272	10278	3157	3157	5222	6209	7120
Sample ID:		LC-10225B-501	LC-10225C-501	LC-10270-501	LC-10272-501	LC-10278-501	LC-3157-501	LC-8205-501	LC-5222-501	LC-6209-501	LC-7120-501
Sample Date:		5/18/2001	5/17/2001	5/31/2001	5/9/2001	5/9/2001	5/8/2001	5/8/2001	5/14/2001	5/14/2001	5/31/2001
Parameter	Unit	Duplicate									
Volatiles											
1,1,2,2-Tetrachloroethane	ug/L	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	ug/L	10 U	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U
Acetone	ug/L	20 U	26 J	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U
Benzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	ug/L	18	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3 J	10 U
Chlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform (Trichloromethane)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/L	10 U	8 J	10 U	10 U	10 U	10 U	10 U	2 J	10 U	10 U
Vinyl chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-Volatiles											
1,2,4-Trichlorobenzene	ug/L	10 U	3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzoic acid	ug/L	0 U	0 U	10 U	10 U	10 U	10 U	10 U	0 U	0 U	10 U
Benzyl Alcohol	ug/L	0 U	0 U	10 U	10 U	10 U	10 U	10 U	0 U	0 U	10 U
bis(2-Ethylhexyl)phthalate	ug/L	10 U	10 U	7 J	16	48	13	18	10 U	10 U	2 J
Di-n-butylphthalate	ug/L	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	ug/L	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ	10 U	10 U	2 J
Naphthalene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pesticides											
Aldrin	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
alpha-BHC	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	ug/L	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

Notes:

- J Estimated.
- N Presumably present.
- R Rejected.
- U Non-detect at associated value.

TABLE 3.3
ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER SAMPLING
SUMMARY OF COMPOUNDS DETECTED
LOVE CANAL MAY 2001

Sample Location:		7132	7205	8106	8110	8120	8130	8140	8210	9110	9115
Sample ID:		LC-7132-501	LC-7205-501	LC-8106-501	LC-8110-501	LC-8120-501	LC-8130-501	LC-8140-501	LC-8210-501	LC-9110-501	LC-9115-501
Sample Date:		5/8/2001	5/8/2001	5/31/2001	5/8/2001	5/8/2001	5/8/2001	5/14/2001	5/8/2001	5/8/2001	5/8/2001
Parameter	Unit										
Volatiles											
1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	ug/L	10 UJ	10 U	10 U	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
Acetone	ug/L	10 UJ	12 U	10 U	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
Benzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	6 J	10 U	10 U	10 U
Chlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform (Trichloromethane)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-Volatiles											
1,2,4-Trichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzoic acid	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	0 U	10 U	10 U	10 U
Benzyl Alcohol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	0 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	ug/L	6 J	4 J	1 J	3 J	3 J	6 J	10 U	6 J	3 J	10 J
Di-n-butylphthalate	ug/L	10 U	10 U	10 U	10 U	2 J	10 U	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	ug/L	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
Naphthalene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pesticides											
Aldrin	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 U	R
alpha-BHC	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.028 J	0.050 U	0.050 U	0.050 U	0.050 U	R
beta-BHC	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 U	R
delta-BHC	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 U	R
Endosulfan I	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 U	R
gamma-BHC (Lindane)	ug/L	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 U	R

Notes:

- J Estimated.
- N Presumably present.
- R Rejected.
- U Non-detect at associated value.

TABLE 3.3
ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER SAMPLING
SUMMARY OF COMPOUNDS DETECTED
LOVE CANAL MAY 2001

Sample Location:		9118	9125	9205	9210
Sample ID:		LC-9118-501	LC-9125-501	LC-9205-501	LC-9210-501
Sample Date:		5/9/2001	5/9/2001	5/31/2001	5/17/2001
Parameter	Unit				
Volatiles					
1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 UJ
1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U
1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
2-Butanone	ug/L	10 UJ	10 UJ	10 U	10 UJ
Acetone	ug/L	10 UJ	10 UJ	10 U	17 J
Benzene	ug/L	10 U	10 U	10 U	10 U
Carbon disulfide	ug/L	10 U	10 U	10 U	10 U
Chlorobenzene	ug/L	10 U	10 U	10 U	10 U
Chloroform (Trichloromethane)	ug/L	10 U	10 U	10 U	10 U
Ethylbenzene	ug/L	10 U	10 U	10 U	10 U
Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U
Toluene	ug/L	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
Trichloroethene	ug/L	10 U	10 U	10 U	10 U
Vinyl chloride	ug/L	10 U	10 U	10 U	10 U
Semi-Volatiles					
1,2,4-Trichlorobenzene	ug/L	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	ug/L	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	ug/L	10 U	10 U	10 U	10 U
2-Chloronaphthalene	ug/L	10 U	10 U	10 U	10 U
2-Methylphenol	ug/L	10 U	10 U	10 U	10 U
4-Methylphenol	ug/L	10 U	10 U	10 U	10 U
Benzoic acid	ug/L	10 U	10 U	10 U	0 U
Benzyl Alcohol	ug/L	10 U	10 U	10 U	0 U
bis(2-Ethylhexyl)phthalate	ug/L	14	7 J	3 J	10 U
Di-n-butylphthalate	ug/L	10 U	10 U	10 U	2 J
Di-n-octyl phthalate	ug/L	10 UJ	10 UJ	10 U	10 U
Naphthalene	ug/L	10 U	10 U	10 U	10 U
Phenol	ug/L	10 U	10 U	10 U	10 U
Pesticides					
Aldrin	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U
alpha-BHC	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U
beta-BHC	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U
delta-BHC	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U
Endosulfan I	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U
gamma-BHC (Lindane)	ug/L	0.050 U	0.050 UJ	0.050 U	0.050 U

Notes:

- J Estimated.
 N Presumably present.
 R Rejected.
 U Non-detect at associated value.

TABLE 3.4

**SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 2001
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

Well Number: 10210A
Sample Date: 07/24/1990 08/22/1991 08/26/1992 08/11/1993 05/25/1995 07/01/1996 07/10/1997 06/26/1998 06/23/1999 06/21/2000 05/18/2001

Volatiles (ug/L)

Vinyl Chloride											
Methylene Chloride											
Acetone	14C			13B				120J			10J
Toluene									2J		
1,1-Dichloroethane											
1,2-Dichloroethene (total)											
Carbon Disulfide					20	310					6J
2-Butanone									2J		
Chloroform											
Trichloroethene											
1,1,2-Trichloroethane											
Benzene											
Chlorobenzene											
Xylene (total)											
1,1,2,2-Tetrachloroethane											
Vinyl Acetate											
Ethylbenzene											
Tetrachloroethene											
2-Hexanone									3J		

Semi-volatiles (ug/L)

Pentachlorophenol											
Phenol									1J		
bis(2-Ethylhexyl)Phthalate		12	21	31	51						
2,4-Dichlorophenol											
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											
2,4-Dimethylphenol											
2-Methylphenol											
4-Methylphenol											
2-Chloronaphthalene											
Benzyl Alcohol											
Benzoic Acid							12J				
Di-n-Octyl Phthalate	3B										
Dimethyl Phthalate	16										
1,2-Dichlorobenzene											
1,4-Dichlorobenzene											
1,2,4-Trichlorobenzene											
Bis(2-Chloroethyl)Ether											
2-Chlorophenol											
Naphthalene											
2-Nitrophenol											
4-Chloro-3-methylphenol											

Pesticides/PCBs (ug/L)

Alpha-BHC									0.28		
Beta-BHC									0.035J		
Delta-BHC											
Gamma-BHC (Lindane)									0.10J		
Gamma-Chlordane											
Heptachlor											
Aldrin											
Heptachlor epoxide											
Endosulfan I									0.046J		
Endosulfan II											
4,4'-DDD											
Endosulfan Sulfate											
Endrin											

Notes:

- B - Found in Blank
- U - Non-Detected at the associated estimated value
- C - Confirmed data.
- J - Estimated Concentration.
- JN - Presumptively present at the associated estimated value
- D - Diluted Sampled.
- E - Exceeded calibration range of the instrument
- P - Greater than 25% difference for detected concentrations between the two GC columns in the pesticide target analyte. Lower of two values is reported.

TABLE 3.4

**SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 2001
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

Well Number:**10210B****Sample Date:**

07/24/1990	08/22/1991	08/26/1992	08/11/1993	06/15/1994	06/01/1995	07/05/1996	07/01/1997	06/18/1998	06/24/1999	06/15/2000	05/17/2001
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Volatiles (ug/L)

Vinyl Chloride											
Methylene Chloride											
Acetone			31		12B	23					12J
Toluene									2J	1J	
1,1-Dichloroethane											
1,2-Dichloroethene (total)											
Carbon Disulfide								8J	2J		14
2-Butanone											
Chloroform											
Trichloroethene											
1,1,2-Trichloroethane											
Benzene											
Chlorobenzene											
Xylene (total)											
1,1,2,2-Tetrachloroethane											
Vinyl Acetate											
Ethylbenzene											
Tetrachloroethene											
2-Hexanone											

Semi-volatiles (ug/L)

Pentachlorophenol											
Phenol			3								
bis(2-Ethylhexyl)Phthalate	7B	13		11				55	6J		
2,4-Dichlorophenol											
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											
2,4-Dimethylphenol											
2-Methylphenol											
4-Methylphenol											
2-Chloronaphthalene											
Benzyl Alcohol											
Benzoic Acid											
Di-n-Octyl Phthalate											3J
Dimethyl Phthalate											
1,2-Dichlorobenzene											
1,4-Dichlorobenzene											
1,2,4-Trichlorobenzene											
Bis(2-Chloroethyl)Ether											
2-Chlorophenol											
Naphthalene											
2-Nitrophenol											
4-Chloro-3-methylphenol											

Pesticides/PCBs (ug/L)

Alpha-BHC											
Beta-BHC											
Delta-BHC											
Gamma-BHC (Lindane)											
Gamma-Chlordane											
Heptachlor											
Aldrin											
Heptachlor epoxide											
Endosulfan I											
Endosulfan II											
4,4'-DDD											
Endosulfan Sulfate											
Endrin											

Notes:

- B - Found in Blank
- U - Non-Detected at the associated t
- C - Confirmed data.
- J - Estimated Concentration.
- JN - Presumptively present at the ass
- D - Diluted Sampled.
- E - Exceeded calibration range of th
- P - Greater than 25% difference for

TABLE 3.4

**SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 2001
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

Well Number: 10210C
Sample Date:

07/25/1990 08/22/1991 08/26/1992 08/11/1993 06/08/1994 06/01/1995 07/01/1996 07/01/1997 06/22/1998 06/24/1999 06/15/2000 05/17/2001

Volatiles (ug/L)

Vinyl Chloride												
Methylene Chloride												
Acetone			10B	23B	19B				2100	8J	9J	
Toluene												
1,1-Dichloroethane												
1,2-Dichloroethene (total)												
Carbon Disulfide										3J		
2-Butanone												
Chloroform												
Trichloroethene												
1,1,2-Trichloroethane												
Benzene												
Chlorobenzene												
Xylene (total)												
1,1,2,2-Tetrachloroethane												
Vinyl Acetate												
Ethylbenzene												
Tetrachloroethene												
2-Hexanone												

Semi-volatiles (ug/L)

Pentachlorophenol												
Phenol		6				22		22				
bis(2-Ethylhexyl)Phthalate	7B	13		38								
2,4-Dichlorophenol												
2,4,5-Trichlorophenol												
2,4,6-Trichlorophenol												
2,4-Dimethylphenol												
2-Methylphenol												
4-Methylphenol						29	110	62	0.6J			
2-Chloronaphthalene												
Benzyl Alcohol												
Benzoic Acid												
Di-n-Octyl Phthalate												
Dimethyl Phthalate												
1,2-Dichlorobenzene												
1,4-Dichlorobenzene												
1,2,4-Trichlorobenzene												
Bis(2-Chloroethyl)Ether												
2-Chlorophenol												
Naphthalene												
2-Nitrophenol												
4-Chloro-3-methylphenol												

Pesticides/PCBs (ug/L)

Alpha-BHC												
Beta-BHC												
Delta-BHC												
Gamma-BHC (Lindane)												
Gamma-Chlordane												
Heptachlor												
Aldrin												
Heptachlor epoxide												
Endosulfan I												
Endosulfan II												
4,4'-DDD												
Endosulfan Sulfate												
Endrin												

Notes:

- B - Found in Blank
- U - Non-Detected at the associated t
- C - Confirmed data.
- J - Estimated Concentration.
- JN - Presumptively present at the ass
- D - Diluted Sampled.
- E - Exceeded calibration range of th
- P - Greater than 25% difference for

TABLE 3.4

**SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 2001
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

Well Number:**10135****Sample Date:**

08/26/1992 08/19/1993 06/22/1994 06/01/1995 06/27/1996 07/07/1997 06/17/1998 06/16/1999 06/22/2000 05/11/2001

Volatiles (ug/L)

Vinyl Chloride					50		48J	62 / 61	110J / 85J	75J / 66J
Methylene Chloride		41			11				24J / 24J	
Acetone		270	100B		60		110J		28J / 46J	
Toluene	2700	1700E	21500BE	18000D	14000	19000 / 17000	16000J	16000 / 17000	21000J / 21000J	22000 / 24000
1,1-Dichloroethane		15						4J / 3J	4J / 4J	4J / 4J
1,2-Dichloroethane (total)	700	840			560		58J	67 / 70	67J / 70J	60J / 59J
Carbon Disulfide								ND / 2J		
2-Butanone		5200							10UJ / 10J	12J / 11J
Chloroform		100			110		150J	120 / 110	100J / 130J	150J / 160J
Trichloroethene		24			36		170J	70 / 58	60J / 72J	140J / 180J
1,1,2-Trichloroethane					14		29J	15 / 12	14J / 16J	29J / 34J
Benzene			6000E	4900D	4800	5600 / 5000	5300J	5600 / 5700	6400 / 6900J	7600 / 8500J
Chlorobenzene	2600	1700		2000D	1500	2300 / ND	1900J	1800 / 1900	2300J / 2300J	2700J / 3000J
Xylene (total)		47	10B		28		55J	43 / 44	42J / 44J	
1,1,2,2-Tetrachloroethane		12			26		94J	32 / 29	27J / 26J	100J / 120J
Vinyl Acetate	6800		12B							
Ethylbenzene		13					12	10J / 9J	12J / 12J	22J / 24J
Tetrachloroethene							40J	13 / 12	16J / 14J	50J / 61J
2-Hexanone										

Semi-volatiles (ug/L)

Pentachlorophenol		52								
Phenol		96	91	140				120 / 96J		ND / 51J
bis(2-Ethylhexyl)Phthalate		50							41J / 24 / J	
2,4-Dichlorophenol	1200B	420	610	150		2100 / 2100	2000	610 / 690	1400J / 470J	620J / 1200J
2,4,5-Trichlorophenol		70					38J		0.9J / ND	
2,4,6-Trichlorophenol									1J / ND	
2,4-Dimethylphenol									ND / 2J	
2-Methylphenol		51					55J	35J / 42J	160J / ND	ND / 41J
4-Methylphenol		80					130J	120 / 95J	99J / 300J	86J / 130J
2-Chloronaphthalene				150						370J / 550J
Benzyl Alcohol				380		1900 / 1600	2700	540 / 680	14000 / 3200J	330J / 630J
Benzoic Acid				6400D	4000	30000J / 27000J	23000J	5000 / 4300	19000J / 4700J	4400J / 6200J
Di-n-Octyl Phthalate										
Dimethyl Phthalate										
1,2-Dichlorobenzene		35						30J / 24J	22J / 18J	ND / 48J
1,4-Dichlorobenzene	110	94	91					74J / 61J	59J / 52J	69J / 110J
1,2,4-Trichlorobenzene		74	87B				78J	65J / 45J	45J / 36J	42J / 65J
Bis(2-Chloroethyl)Ether		23					24J	26J / 25J		
2-Chlorophenol							28J	25J / ND		
Naphthalene								2000J / 1400J	4000J / 1800J	1100 / 1400
2-Nitrophenol									ND / 1J	
4-Chloro-3-methylphenol								33J / 25J		

Pesticides/PCBs (ug/L)

Alpha-BHC	84	42C	24CEP	28D	29	39 / 39	59	37J / 40	50 / 50	43J / 50J
Beta-BHC				10D	11	8.1 / 8.6	12	11J / 12	15 / 16	16J / 16J
Delta-BHC	15	9.8P	7.5CE	4.7	5.2	ND / 5.1	8.9	9.6J / 11	14 / 13	10J / 12J
Gamma-BHC (Lindane)	33	19.5	20.4CE			13.2 / 14.8	6.5J	4.1J / 5.5	8.0 / 6.4	5J / 7.3
Gamma-Chlordane									0.16J / 0.18J	
Heptachlor								0.68JN / 0.63		
Aldrin	0.53	0.24P						0.21J / 0.74JN		0.95JN / 1.5JN
Heptachlor epoxide								0.058J / 0.043J	0.029J / 0.031J	
Endosulfan I								0.43J / 0.34		1.5JN / 1.6JN
Endosulfan II									0.52J / 0.69J	
4,4'-DDD								0.020J / 0.21	0.071J / 0.13J	
Endosulfan Sulfate		0.43P						0.17J / 0.18	0.17J / 0.10UJ	
Endrin			0.15P							

Notes:

- B - Found in Blank
- U - Non-Detected at the associated t
- C - Confirmed data.
- J - Estimated Concentration.
- JN - Presumptively present at the ass
- D - Diluted Sampled.
- E - Exceeded calibration range of th
- P - Greater than 25% difference for

TABLE 3.5A

**1140 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1)	1144	1143	1142	1141	Tile Drain	1140
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	574.10	571.27	567.12	566.20	561.70	563.60
May 01	573.44	570.90	572.07	565.90	561.70	563.87
August 01	571.60	569.35	566.99	566.59	561.70	564.20
November 01	572.30	569.75	569.20	566.15	561.70	564.60

B WELLS

Well (1)	1144	1143	1142	1141	Tile Drain	1140
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	571.58	571.08	567.25	566.24	561.70	564.35
May 01	570.90	570.65	567.50	566.55	561.70	563.72
August 01	569.32	569.34	566.93	566.44	561.70	564.30
November 01	570.38	569.65	567.25	566.65	561.70	564.83

C WELLS

Well (1)	1144	1143	1142	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	571.32	569.40	565.66	561.70
May 01	570.60	569.48	565.40	561.70
August 01	568.79	568.70	565.58	561.70
November 01	567.12	568.50	565.87	561.70

D WELLS

Well (1)	1144	1143	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	569.48	567.60	561.70
May 01	569.29	567.45	561.70
August 01	568.45	567.10	561.70
November 01	567.85	567.30	561.70

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 3.5B

**1150 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1)	1154	1153	1151	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	567.40	571.18	567.21	561.85
May 01	567.97	569.60	567.33	561.85
August 01	567.27	568.68	567.45	561.85
November 01	567.35	569.76	567.36	561.85

B WELLS

Well (1)	1154	1153	1151	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	567.94	568.82	567.88	561.85
May 01	568.02	568.42	567.90	561.85
August 01	567.83	567.22	567.76	561.85
November 01	568.33	569.12	567.76	561.85

C WELLS

Well (1)	1154	1153	1151	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	568.88	575.92	569.68	561.85
May 01	568.32	573.58	569.17	561.85
August 01	567.38	568.58	568.39	561.85
November 01	568.23	573.68	567.45	561.85

D WELLS

Well (1)	1154	1153	1151	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	569.10	570.79	571.87	561.85
May 01	569.28	571.44	570.46	561.85
August 01	DRY	571.09	569.30	561.85
November 01	568.31	570.31	568.44	561.85

E WELLS

Well (1)	1153	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)
March 01	575.38	561.85
May 01	571.20	561.85
August 01	570.70	561.85
November 01	569.30	561.85

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 3.5C

**1160 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1)	10176	1165	1163	1162	1161	Tile Drain	1160
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	567.35	575.14	568.40	565.67	564.20	560.60	564.00
May 01	567.09	575.56	568.70	566.41	564.00	560.60	563.85
August 01	564.52	574.45	567.70	565.92	563.18	560.60	563.70
November 01	567.57	575.68	569.15	566.70	566.15	560.60	564.40

B WELLS

Well (1)	10176	1165	1163	1161	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	567.06	579.59	569.65	566.14	560.60
May 01	566.99	579.77	570.22	565.81	560.60
August 01	564.38	579.37	569.28	565.94	560.60
November 01	567.10	579.30	569.50	566.46	560.60

C WELLS

Well (1)	10176	1165	1163	1162	1161	Tile Drain	1160
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	565.15	580.07	569.70	569.45	568.44	560.60	564.50
May 01	565.13	580.36	570.96	570.70	568.80	560.60	564.76
August 01	564.22	579.33	570.00	568.97	568.25	560.60	565.35
November 01	565.35	579.70	570.10	569.54	568.43	560.60	565.60

D WELLS

Well (1)	10176	1165	1163	1162	1161	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	563.18	577.68	569.30	570.74	569.18	560.60
May 01	563.69	578.51	DRY	570.49	569.54	560.60
August 01	562.80	577.16	570.10	571.04	568.86	560.60
November 01	564.00	577.20	DRY	570.58	569.20	560.60

E WELLS

Well (1)	1161	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)
March 01	564.61	560.60
May 01	574.37	560.60
August 01	564.26	560.60
November 01	565.21	560.60

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 3.5D

**1170 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1)	1174	1173	1172	1171	Tile Drain	1170
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	576.03	568.42	565.23	573.82	555.60	562.58
May 01	575.71	568.29	566.18	563.92	555.60	562.02
August 01	575.19	567.51	566.18	563.68	555.60	562.18
November 01	575.35	568.11	566.32	564.07	555.60	562.73

B WELLS

Well (1)	1174	1173	1172	1171	Tile Drain	1170
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	575.15	569.12	569.75	562.47	555.60	560.79
May 01	575.22	568.92	569.44	562.21	555.60	561.01
August 01	575.00	568.88	568.76	562.38	555.60	560.90
November 01	574.78	569.25	568.52	563.75	555.60	561.66

C WELLS

Well (1)	1174	1173	1172	1171	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	576.86	571.16	568.80	561.93	555.60
May 01	577.04	571.04	569.07	561.94	555.60
August 01	574.38	570.48	568.72	561.12	555.60
November 01	575.23	570.07	568.52	562.29	555.60

D WELLS

Well (1)	1174	1173	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	571.58	571.56	555.60
May 01	572.03	570.95	555.60
August 01	571.51	569.31	555.60
November 01	571.78	570.10	555.60

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 3.5E

**1180 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1) Date	1184 (ft. AMSL)	1183 (ft. AMSL)	1181 (ft. AMSL)	Tile Drain (ft. AMSL)	1180 (ft. AMSL)
March 01	564.45	565.95	567.26	560.00	563.14
May 01	564.37	565.91	566.85	560.00	562.77
August 01	563.88	565.54	566.40	560.00	562.99
November 01	563.43	565.59	567.11	560.00	563.09

B WELLS

Well (1) Date	1184 (ft. AMSL)	1183 (ft. AMSL)	1181 (ft. AMSL)	Tile Drain (ft. AMSL)	1180 (ft. AMSL)
March 01	564.94	565.67	567.45	560.00	561.08
May 01	565.00	565.38	566.80	560.00	561.07
August 01	563.14	564.70	566.34	560.00	559.44
November 01	562.98	564.79	567.38	560.00	561.72

C WELLS

Well (1) Date	1184 (ft. AMSL)	1183 (ft. AMSL)	1181 (ft. AMSL)	Tile Drain (ft. AMSL)	1180 (ft. AMSL)
March 01	568.80	567.73	570.74	560.00	563.17
May 01	567.81	567.73	569.99	560.00	DRY
August 01	569.35	566.61	567.65	560.00	574.83
November 01	DRY	567.33	570.31	560.00	DRY

D WELLS

Well (1) Date	1184 (ft. AMSL)	1183 (ft. AMSL)	Tile Drain (ft. AMSL)
March 01	569.09	566.98	560.00
May 01	567.64	567.23	560.00
August 01	DRY	567.38	560.00
November 01	DRY	567.18	560.00

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 3.5F

**1190 SERIES PIEZOMETERS WATER LEVELS
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION**

A WELLS

Well (1)	1194	1193	1192	1191	Tile Drain	1190
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	564.61	565.64	564.79	565.46	554.80	564.94
May 01	564.48	565.61	564.74	565.41	554.80	564.04
August 01	563.43	565.03	563.29	565.53	554.80	563.28
November 01	563.67	565.21	563.63	565.86	554.80	566.17

B WELLS

Well (1)	1194	1193	1192	1191	Tile Drain	1190
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	569.69	567.91	567.50	564.42	554.80	559.92
May 01	568.90	568.25	568.13	564.50	554.80	559.55
August 01	568.21	568.43	568.38	564.94	554.80	559.07
November 01	568.95	568.65	568.61	564.85	554.80	560.62

C WELLS

Well (1)	1194	1193	1192	1191	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	572.46	570.24	571.45	564.07	554.80
May 01	571.56	570.40	571.30	563.81	554.80
August 01	569.96	570.49	571.76	563.87	554.80
November 01	574.56	570.43	571.85	564.38	554.80

D WELLS

Well (1)	1194	1193	Tile Drain
Date	(ft. AMSL)	(ft. AMSL)	(ft. AMSL)
March 01	573.67	571.32	554.80
May 01	572.71	571.08	554.80
August 01	570.63	570.84	554.80
November 01	572.54	570.94	554.80

Note:

(1) Wells listed in order from most distant outside of tile drain, to tile drain, then inside of tile drain.

TABLE 4.1

**2001 LOVE CANAL SYSTEM REPAIRS
OCCIDENTAL CHEMICAL CORPORATION
GLENN SPRINGS HOLDINGS, INC.
MILLER SPRINGS REMEDIATION MANAGEMENT, INC.**

- Removal of the former Decon-Pad west of the Administration Building along 95th Street, which included demolition, grading with topsoil and seeding.
- Replacement of the air conditioner condenser for the Administration Building.
- A slight build-up of debris (rocks and sludge) was found in Manhole 6B (Second Manhole North of PC2A) within the Northwest section of the collection system. The manhole was cleaned of debris and the drains entering the manhole were flushed.
- The Treatment Building process floor was prepped and re-coated with a water-based epoxy paint.
- Replacement of the breaker/fuse on the Decon Drum Storage Facility (DDSF) sump pump.
- Replaced the bearing on the Treatment Building exhaust fan.
- Replacement of the back-flow preventer in the Administration Building.
- Installed a new expansion tank inline with the hot-water tank in the Administration Building.
- Installed expansion plugs in the abandoned sanitary sewer/line (MH-97.107) on 97th Street (within Site). The manhole was then filled with concrete. Manholes on either end had been decommissioned and filled previously by the NYSDEC.
- An internal visual inspection of the Main Carbon Transfer Bed (V-3) was performed.
- Annual inspection of the back-flow preventers was performed.
- The DCF pump motor was replaced in the Main Storage Tank (Station #4).
- The DCF pump was replaced in the Main Storage Tank (Station #4) due to a worn bearing. The DCF Pump Motor was replaced in the Main Storage Tank (Station #4).
- The PC3A North Pump was pulled. The pump was plugged with debris. The pump was cleared of debris and replaced in PC3A
- The West Pump in PC3 was replaced.
- The PC3 East Pump was rebuilt, and replaced.

- Upgraded PC3, PC3A, PC1A and the Influent flow meters.
- Outside light fixtures were replaced on the Treatment Building. Photo sensor eyes were replaced as needed on the Treatment, Administration and DDSF.
- Replacement of emergency exit lights in the Treatment Building.
- Modification of Security System in the Administration Building, including repositioning the motion detector.
- Planting of 72 trees (Oaks, Pines, and Maples) along the perimeter of the Site, concentrating along 100th Street (East Side of Site).
- Three depressions were filled on the Landfill adjacent to the Canal. All depressions were located in the North Sector, 2 West of the Canal (17'Wx19'Lx2-4"D; and 14'Wx17'Lx2-4"D), and 1 East of Canal (15'Wx12'Lx2-4"D). The depressions were filled with sandy-loam and topped with topsoil. The soil was then seeded.
- Thirty-five (35) acres adjacent to the Site were mowed (as a one-time event) from 100th Street to 102nd Street, spanning from Colvin Blvd. to Frontier Avenue, as part of community outreach and area beautification.
- A dike inspection of Outside Storage Tanks was performed.
- Maintenance and landscaping of the Site and surrounding areas.
- Maintenance of flowerbeds and shrubs along Colvin Blvd. and Frontier Avenue.
- Additional flowers and shrubs at front entrance at 95th Street and Read Avenue.
- Cleanup of discarded debris around fence line and adjacent lots.