GLENN SPRINGS HOLDINGS, INC.

2480 Fortune Dr. - Suite 300 - Lexington, KY 40509

George Luxbacher ***Telephone (606) 543-2159***
Director - Operations ***Facsimile (606) 543-2171***

March 31, 2000

Mr. Gerald J Rider, P.E.
Chief, Operation, Maintenance and Support Section
New York State Department of Environmental Conservation
Bureau of Water Compliance Programs
50 Wolf Road,
Albany, NY 12233-3056

Re: Love Canal 1999 Annual Report

Dear Mr. Rider:

On behalf of Occidental Chemical Corporation and Miller Springs Remediation Management, Inc., enclosed are three (3) copies of:

- Love Canal 1999 Annual Report; and
- Love Canal 1999 Operations/Monitoring Report

The Annual Report is a brief summary of the Operation/Monitoring Report that we distribute to individuals on the mailing list, in accordance with Section 4. of Appendix B of the Consent Judgment between Occidental Chemical Corporation (OCC) and the State of New York. If you have any questions please do not hesitate to call.

Sincerely,

George Luxbacher, P.E., Ph.D.

c.c. D. Tubridy, MSRM
B. Downie, MSRM
D. Duda, EPA Region 2

GLENN SPRINGS HOLDINGS, INC.

MILLER SPRINGS REMEDIATION MANAGEMENT, INC.

1999 OPERATION AND MONITORING REPORT FIFTH YEAR

Love Canal
Occidental Chemical Corporation
Niagara Falls, New York

1999 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 for the Love Canal Site was assigned by Occidental Chemical Corporation 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 fifth annual report prepared for Occidental Chemical and covers operating and monitoring activities for 1999.

2.0 REMEDIAL SYSTEMS

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, intended 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 towards a series of manholes and wet wells (PC-1A / PC-2A North / Central & 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 & PC-3 South) where it is held prior to being treated at on-site treatment facility and discharged into the City of Niagara Falls sewer system.

2.1 OPERATIONS OF THE BARRIER DRAIN AND WELL COLLECTION SYSTEMS

2.1.1 Barrier Drain System

During 1999 there was no maintenance performed on the Barrier Drain system. The system functioned without any problems or irregularities during the year.

2.1.2 Wet Well Collection System

The collection well system consists of two sectors, the Northern / Central and the Southern Collection System. In 1999 the collection systems were operational and functioned properly throughout the year.

The 102nd Street Landfill Site leachate line connection into the Love Canal Treatment Facility (LCTF) at the southern storage tank (PC-3) was completed in March of 1999. This provides for treatment of the 102nd Street leachate through the LCTF.

During 1999 several upgrades and maintenance activities occurred; a list of these activities is presented below:

- Clean out of wet wells PC-1, PC-2, PC-3 (storage tank and wet well) and PC-3A (six-chamber system and wet well). During the clean out 2,574 gallons of NAPL were recovered. The NAPL was shipped to the Safety-Kleen facility in Deer Park, TX for incineration.
- Wet Well PC-1 and PC-2: Pumping system upgraded to a new submersible pump system from the previous dry chamber pump system. The submersible pump provides improved performance and reliability and eliminates the need for a confined space entry when performing maintenance activities.
- Well PC-2A: Replaced the pump and motor in November of 1999. The bearings in both the in motor and pump had failed.
- Replaced level indicators in the wet wells (PC-1, PC-2, PC-3, PC-1A, PC2A & PC3A) with new submersible transducers, providing continuous and reliable level reading.

3.0 GROUND-WATER TREATMENT AND MONITORING

3.1 GROUND-WATER TREATMENT

3.1.1 Treatment System

The treatment system consists of series of filters and carbon beds prior to the discharge to the City of Niagara Falls sewer system. One carbon bed change was performed in 1999. There were no major problems or repairs, other than normal maintenance, in the operation of the system. In 1999 several maintenance activities occurred; a list of those activities are listed in bullet form below:

- Completion from prior year (1998) of new process control software program (Fix-32 from Intellution).
- Computer system control upgrades completed to include the 102nd Street Landfill site.
- Clarifier clean out and inspection of wall integrity.
- Clarifier upgrades of the NAPL transfer line to NAPL storage tank, which included isolation valves and a clean out flange.
- Clarifier re-piping and upgrade to stainless lines within the clarifier system airlift station for NAPL transfer.
- Replaced bottom discharge valve on the carbon transfer bed and on one of the main carbon beds.

3.1.2 Effluent Discharge

During 1999 groundwater treated at the Love Canal Leachate Treatment Facility was as follows:

Total treated at LCTF (including 102nd Street):	4,372,300 gallons
Pumped from 102nd Street Site:	1,778,200
Net Love Canal Collection:	2,594,100

Table 3.1 shows the monthly total and average treated groundwater quantities for the 1995 to 1999 periods.

In April of 1999, the 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 (PC-3). During the remainder of the year, the four-well system at 102nd Street pumped 1,778,200 gallons to Love Canal (PC3), were it was then batch treated along with ground water accumulated on site.

3.1.3 Sampling

Sampling of the effluent discharge to City of Niagara Falls sewer system occurred quarterly as required by wastewater discharge permit. As part of the permit requirements, City and MSRM personnel completed a joint annual verification sampling in the third quarter sampling event. Throughout the year sampling results were submitted to the City; levels were below required limits on all sampled parameters based on the wastewater discharge permit.

3.1.4 Precipitation

Precipitation for the year in Niagara Falls totaled 31.65 inches (National Weather Service data), compared to the average of 37.84 inches (1995 through 1998), indicating decreased infiltration into the shallow overburden groundwater system. Table 3.1 provides historic precipitation data.

3.2 GROUND-WATER MONITORING

3.2.1 Chemical Monitoring

The 1999 chemical sampling event was performed over a 3-week period from June 06 to June 24, 1999; 42 samples were collected (39 wells and 3 blanks). Figure 3.1 identifies the wells sampled and their locations. Table 3.2 provides a summary of the wells (20 overburden & 19 bedrock) sampled and the number of compounds found at or above detection limits in each well.

Table 3.3 presents the data for the 26 wells that had analytical results above compound detection levels. The numbers of different compounds detected in 1999 sampling were seventeen VOCs, seventeen SVOCs and ten pesticides. The majority of these compounds (thirteen VOCs, thirteen SVOCs and ten pesticides) were detected in well 10135, which historically has the highest number and

concentration of compounds. Table 3.4 presents a summary of detected compounds of the four long-term monitoring wells (10210A, 10210B, 10210C & 10135) from 1990 to 1999. This data shows that the compounds detected in 1999 were at similar concentrations to those compounds detected in previous years.

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 New York State Department of Environmental Conservation (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.

The 1999 chemical analytical results are consistent with previous Long-Term Monitoring analytical results; there was minimal detection of chemicals in the wells sampled. Detected chemicals were at low levels and do not indicate a failure in the barrier drain or pose an immediate threat to groundwater quality.

3.2.2 Hydraulic Containment

Water levels were measured at six-nested piezometer strings in March, June, September and December 1999. 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 June 1999 along the six piezometer strings. The water level data is presented in Tables 3.5A to 3.5F.

The groundwater level data shows that groundwater flow 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 1999 are listed in Table 4.1. A brief description of major activities is presented below.

4.1 PROCESS ACTIVITIES

A modification to the existing Love Canal Discharge Permit (No. 44) from the City of Niagara Falls was granted and implemented in March of 1999. The modification increased the flow limitation (effluent discharge) from a maximum of 100,000 gallons / day to a maximum of 300,000-gallons / day discharge.

Work was completed on a self-contained pipeline (forcemain) system to deliver the 102nd Street landfill leachate to the LCTF.

MSRM has continued to upgrade the process system software. The upgrades provide improved monitoring, logging, and control of the site collection and treatment plant process parameters.

4.2 NON-PROCESS ACTIVITIES

Renovations to the office building included the removal of the on-site laboratory facility and conversion of storage and idle areas into office workspace.

Two slight depressions were filled with topsoil and then graded to the existing cap slope.

Landscaping upgrades of the general site including the surrounding fence line continued in 1999. Activities of note included shrubbery and flowerbeds outside the fence along Colvin Boulevard at the north-end of the Site.

City of Niagara Falls Fire Department toured the Site in summer of this year and reviewed Emergency Response Plan.

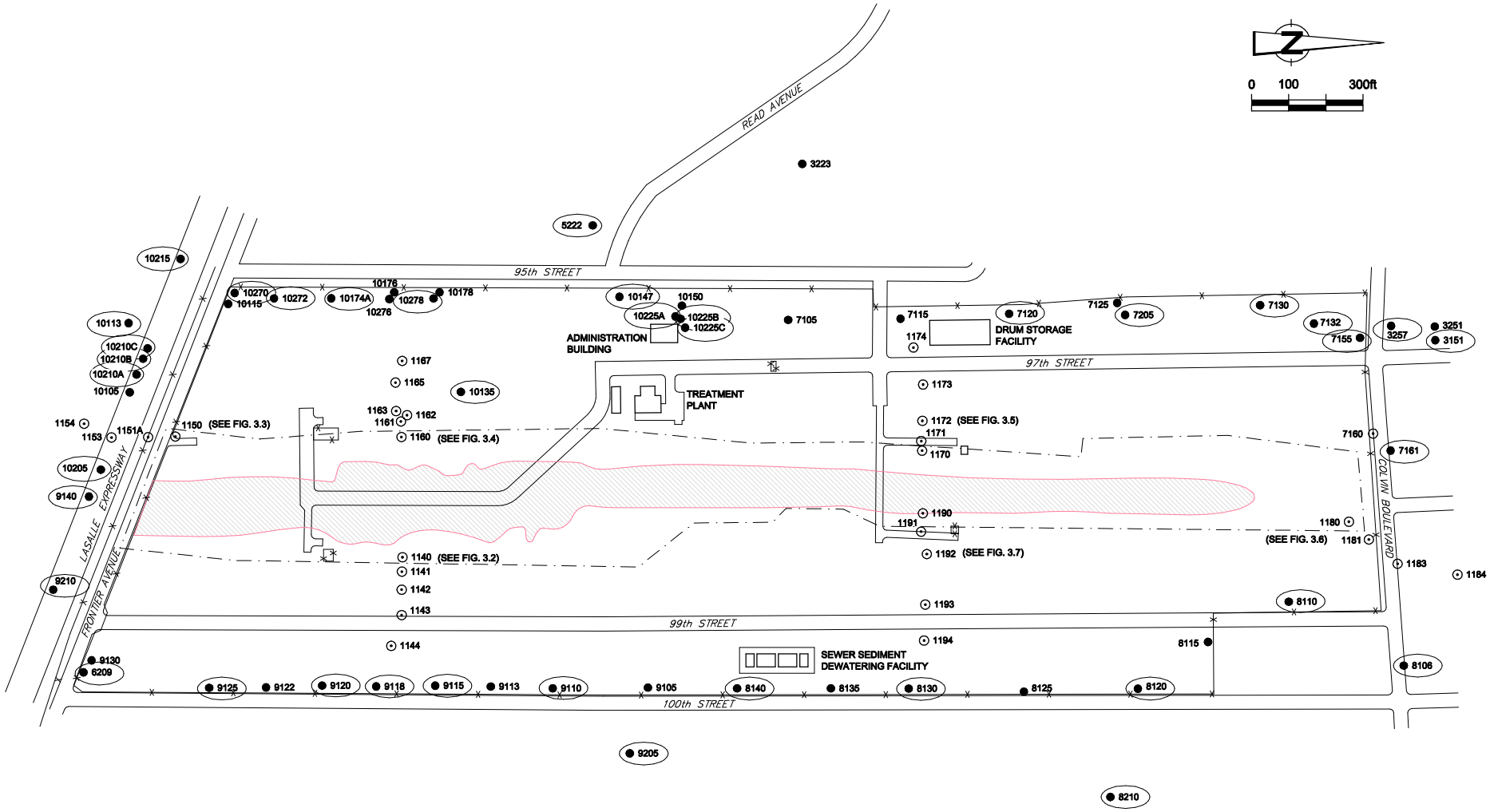
Tours of the facility were provided throughout the year to representatives of environmental agencies and students of various educational levels. Tours given during the year included:

- Farnsworth Middle School of Guilderland, NY.
- Sir Sandford Fleming College of Lindsay, Ontario.
- NYSDEC, EPA, and NYSDOH personnel.
- Great Lakes Student Summit, a biennial tour of environmental sites and activities, which helps educate children on the environment. This group consisted of approximately 240 children and their chaperones from 17 different schools in three states and Ontario.
- Dr. Y.R. Chen, Secretary General of the Taiwan EPA, as part of the Environmental Exchange Program.
- Delegates from Minsk, Belarus, as part of the Council for International Visitors.
- "WDR", a public television network from Cologne, Germany.

5.0 CONCLUSION

The 1999 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: 4,372,300 gallons of leachate were treated and discharged from the Site. The 102nd Street Landfill Site leachate line connection into the Love Canal Treatment Facility (LCTF) at the southern storage tank (PC-3) was completed in March of 1999. This provides for treatment of the 102nd Street leachate through the LCTF: 1,778,200 gallons of leachate were pumped from 102nd Street Site to LCTF for the year.

LIST OF FIGURES
(Attached)



LEGEND

- FENCE LINE
- BARRIER DRAIN
- 7105 PIEZOMETER WELL
- 1167 OBSERVATION WELL
- WELLS SAMPLED IN JUNE 1999
- APPROXIMATE LIMITS OF DISPOSED WASTE

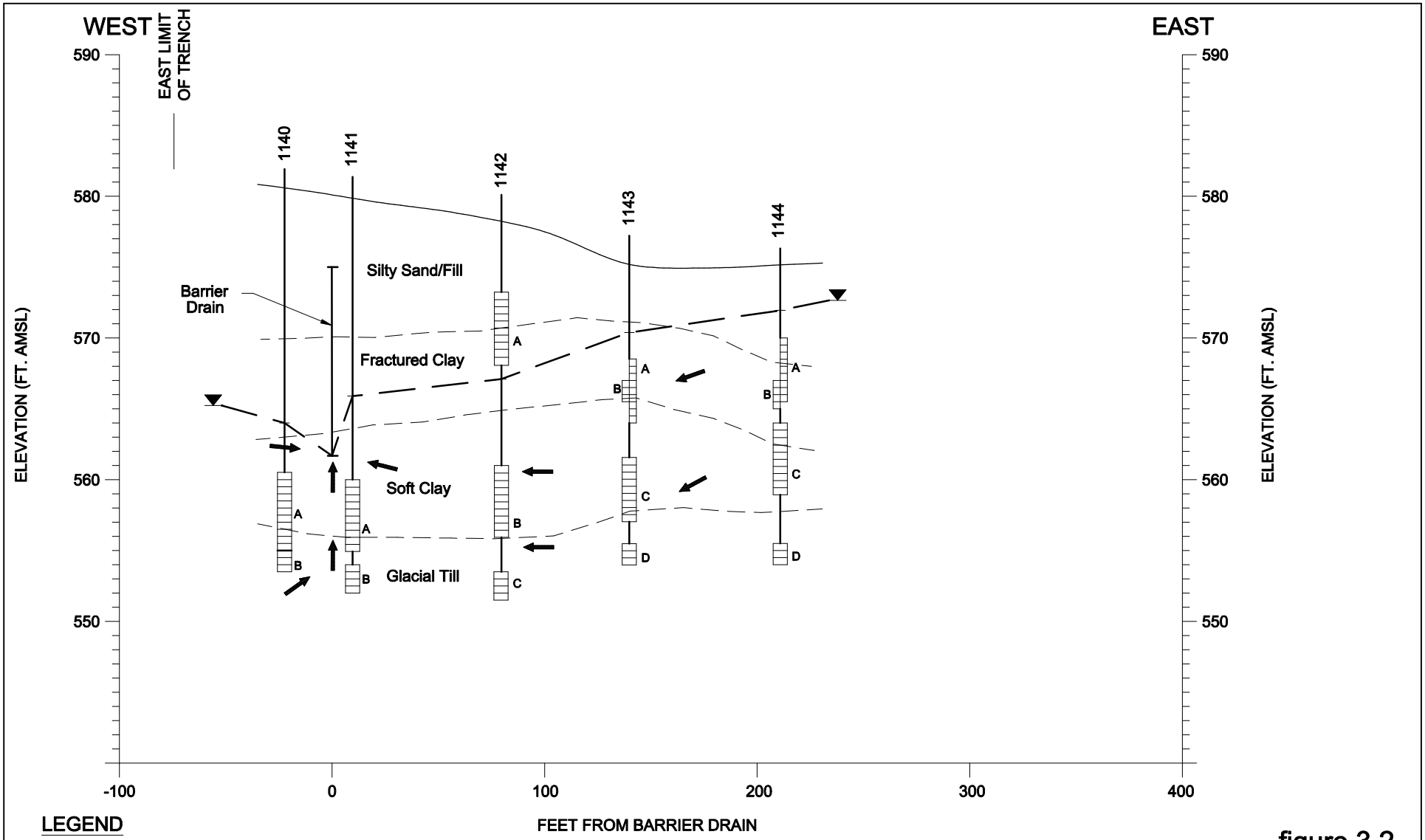
figure 3.1

1999 GROUNDWATER SAMPLE COLLECTION PROGRAM
LOVE CANAL

Miller Springs Remediation Management

CRA

09954-00(002)GN-WA007 MAR 08/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

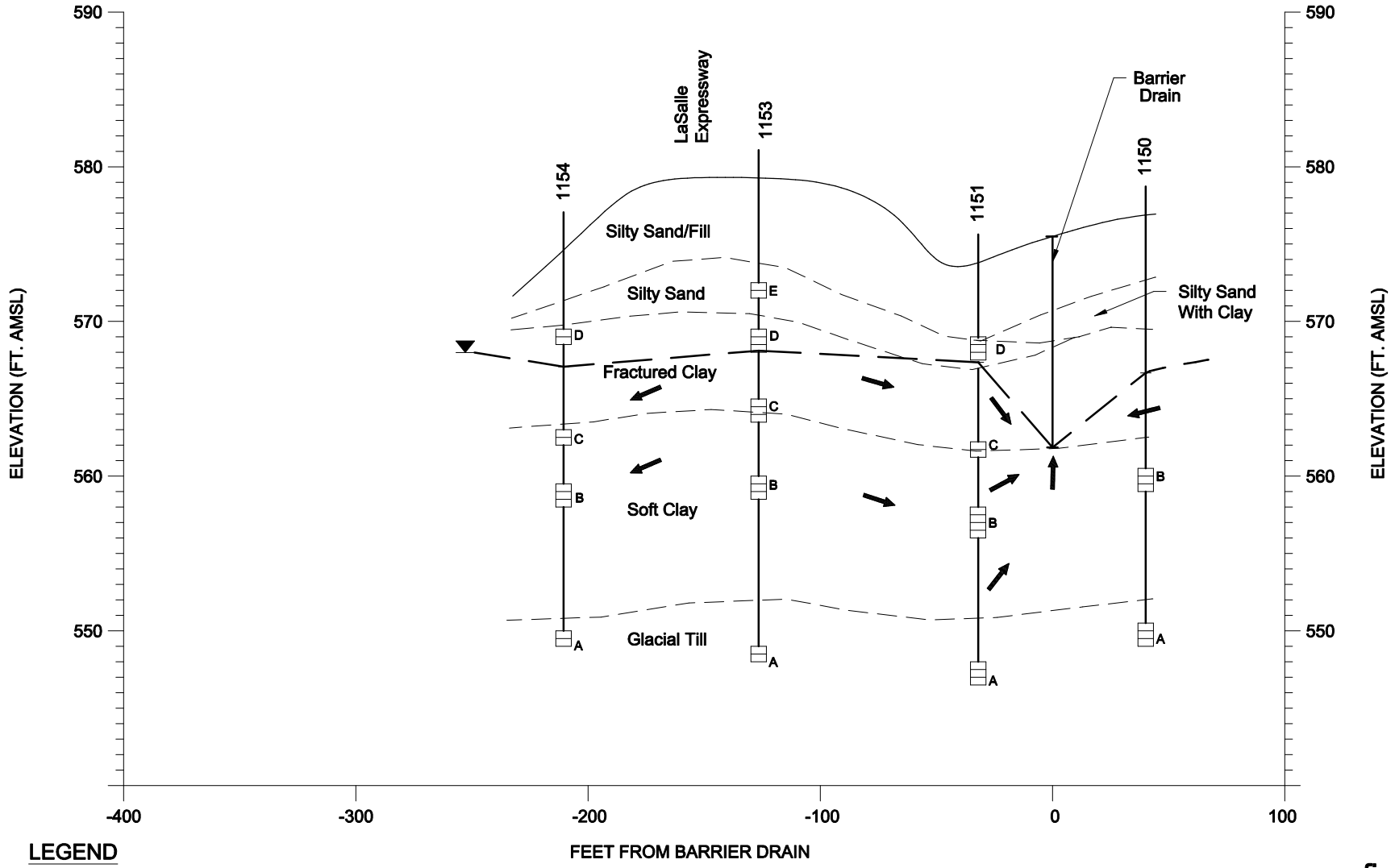
figure 3.2

JUNE 1999 FLOW DIAGRAM 1140 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA

09954-00(002)GN-WA001 MAR 03/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

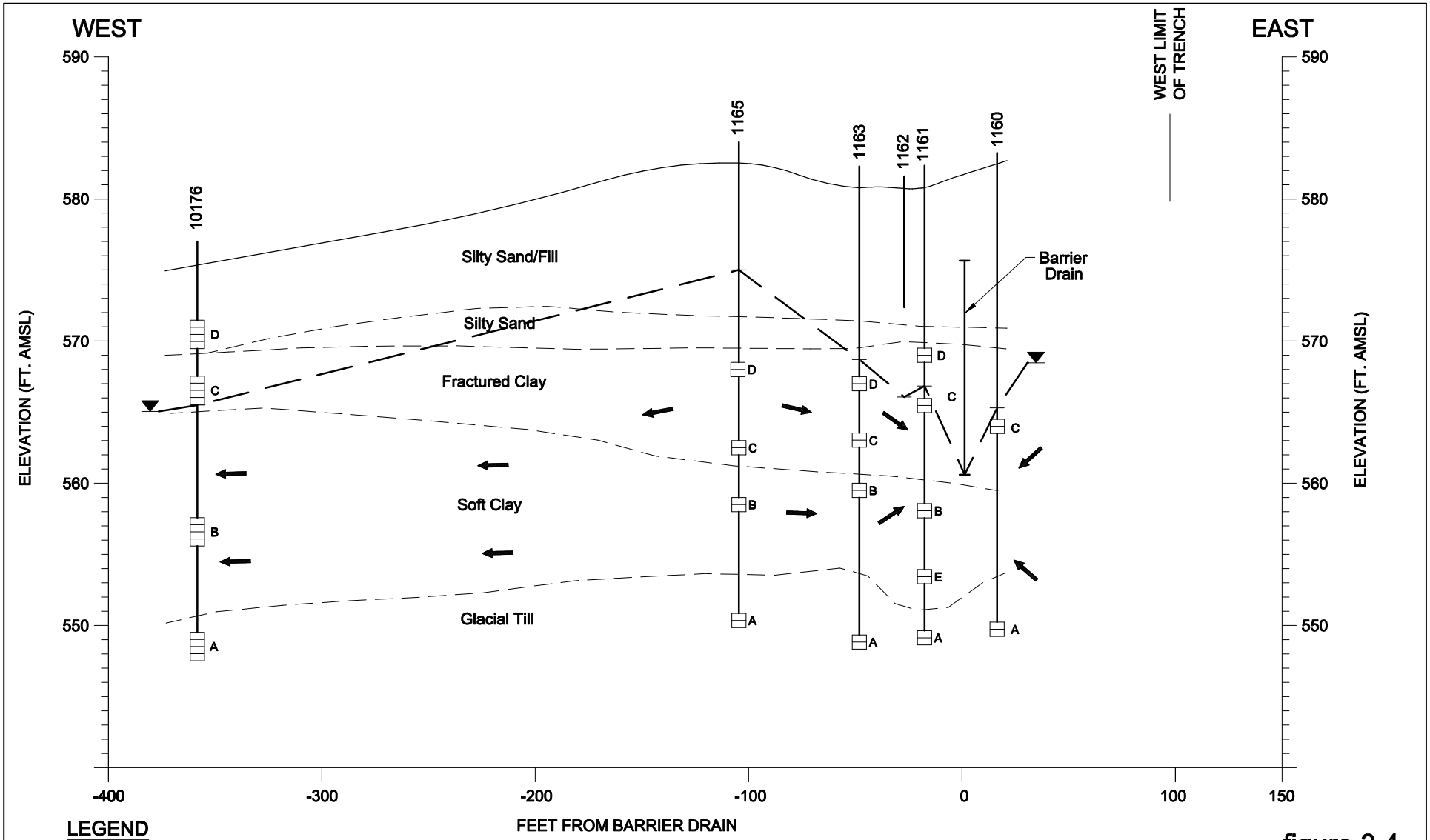
figure 3.3

JUNE 1999 FLOW DIAGRAM 1150 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA

09954-00(002)GN-WA002 MAR 03/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

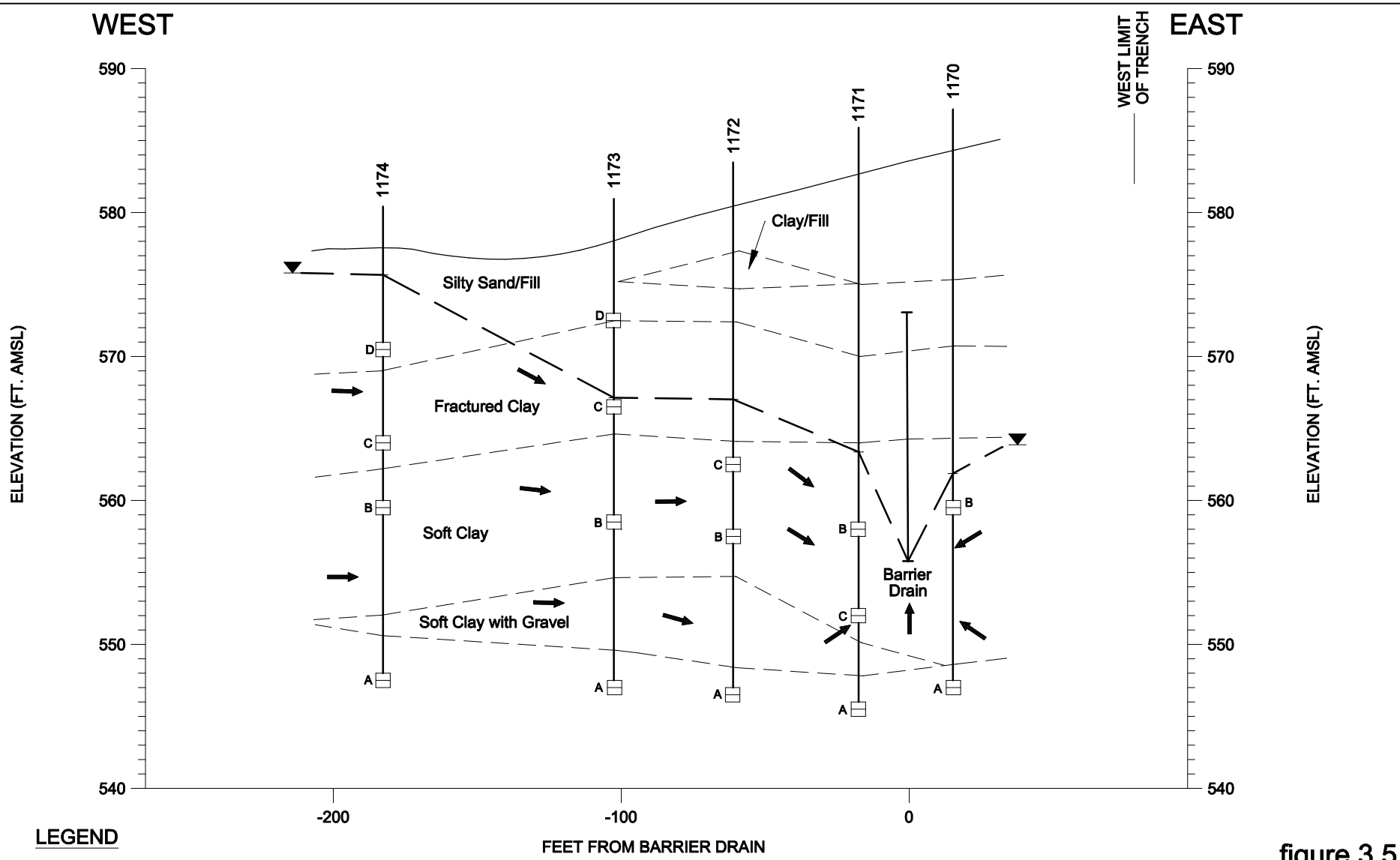
CRA

figure 3.4

JUNE 1999 FLOW DIAGRAM 1160 SERIES PIEZOMETER LOVE CANAL

Miller Springs Remediation Management

09954-00(002)GN-WA003 MAR 03/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

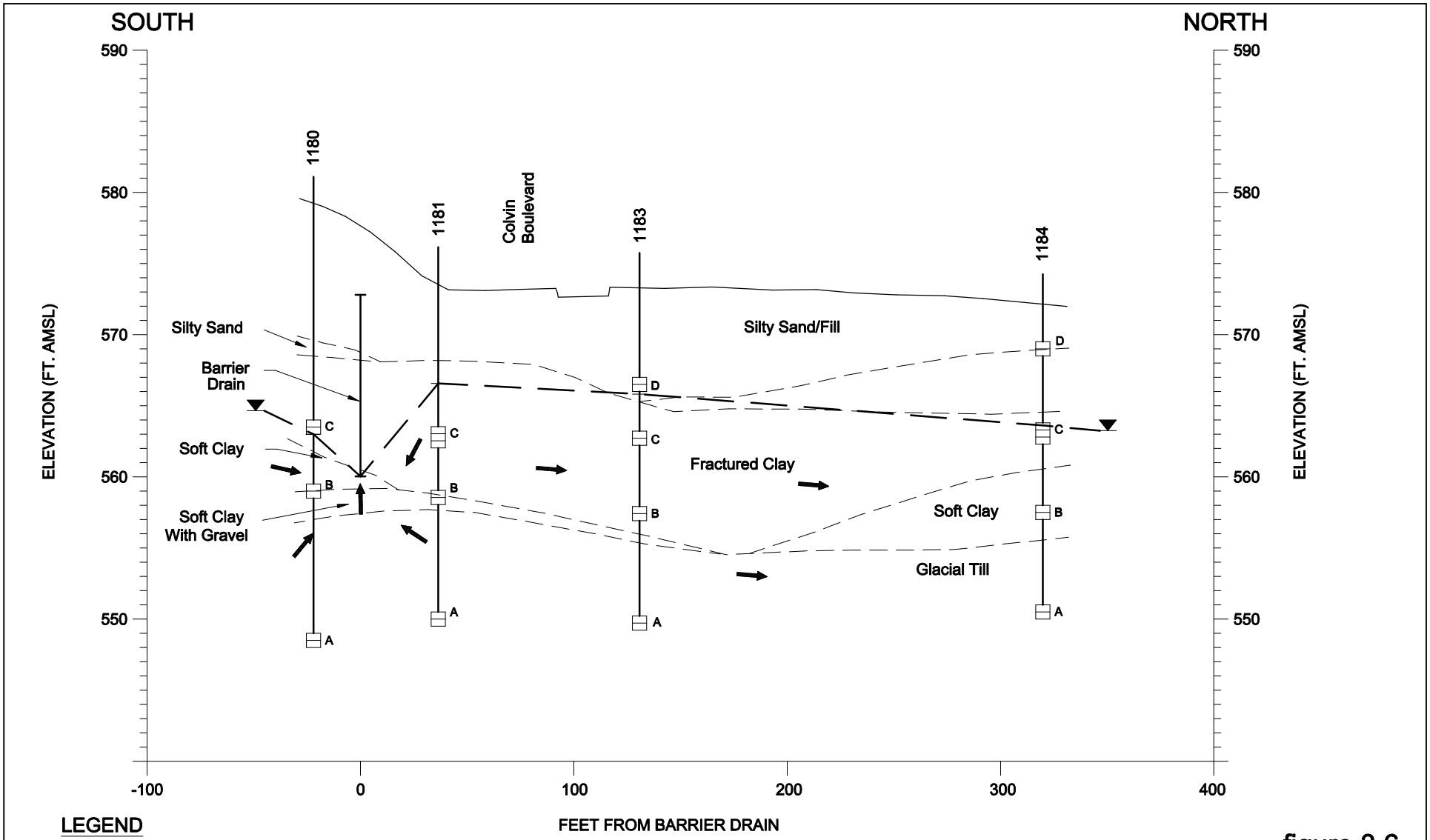
figure 3.5

JUNE 1999 FLOW DIAGRAM 1170 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA

09954-00(002)GN-WA004 MAR 03/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

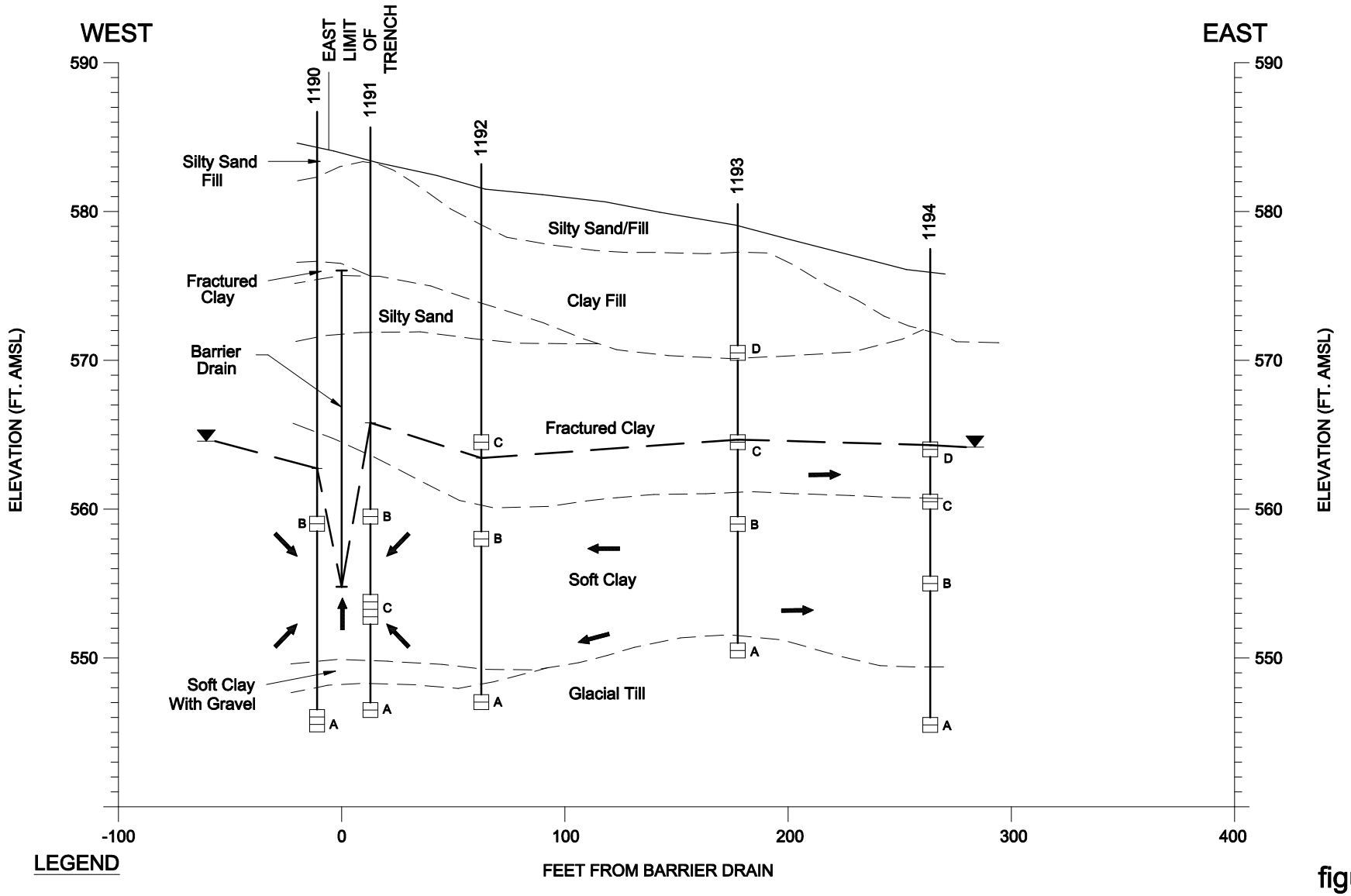
CRA

figure 3.6

JUNE 1999 FLOW DIAGRAM 1180 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

09954-00(002)GN-WA005 MAR 03/2000



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

figure 3.7

JUNE 1999 FLOW DIAGRAM 1190 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA

09954-00(002)GN-WA006 MAR 03/2000

LIST OF TABLES
(Attached)

TABLE 3.1

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

Month	*Volume (gal)*					
	1995	*1996*	*1997*	*1998*	*1999*	
					Total Treated (1)	LC Treated (2)
January	**597,650**	**474,330**	**337,720**	**700,070**	***335,700***	**335,700**
February	**202,235**	**252,450**	**456,800**	**539,838**	***270,100***	**270,100**
March	**385,910**	**331,690**	**520,600**	**615,133**	***409,300***	**321,558**
April	**132,790**	**615,350**	**184,400**	**437,817**	***555,200***	**296,535**
May	**123,140**	**513,310**	**126,850**	**139,600**	***401,500***	**123,790**
June	**125,300**	**251,400**	**210,630**	**99,800**	***323,500***	**63,658**
July	**132,400**	**113,300**	**96,810**	**130,200**	***143,600***	**104,649**
August	**112,910**	**146,700**	**223,390**	**138,300**	***230,600***	**97,423**
September	**111,200**	**310,550**	**116,790**	**95,200**	***232,100***	**62,759**
October	**491,440**	**532,360**	**326,100**	**71,500**	***283,400***	**175,837**
November	**641,210**	**393,730**	**346,550**	**46,200**	***491,800***	**344,145**
December	**235,900**	**499,540**	**524,760**	**73,800**	***695,500***	**397,912**
Total	**3,292,085**	**4,434,710**	**3,471,400**	**3,087,458**	***4,372,300***	**2,594,066**
Monthly Average	**274,340**	**369,560**	**289,280**	**257,288**	***364,358***	**216,172**
Rainfall Inches	**33.99**	**48.22**	**41.17**	**27.97**	**31.65**	

NOTES: (1) Total Treated: As of March 1999 Treatment at LCTF included leachate collected from 102nd
(2) LC (Love Canal) Treated: Total treated less received from 102nd Street.

TABLE 3.2

SUMMARY OF DETECTED COMPOUNDS
1999 LONG-TERM MONITORING PROGRAM
LOVE CANAL
OCCIDENTAL CHEMICAL CORPORATION

Overburden Wells	*VOCs*	*SVOCs*	*Pesticides/PCBs*
3151	1	ND	ND
7130	ND / ND	ND / ND	ND / ND
7132	ND	2	ND
7155	ND	1	ND
7161	ND	ND	ND
8106	ND	2	ND
8110	ND	1	ND
8120	ND	1	ND
8130	1	1	ND
8140	ND	ND	ND
9110	ND	ND	ND
9115	1	1	ND
9118	ND / ND	ND / ND	ND / ND
9120	ND	1	ND
9125	ND	ND	ND
9140	ND	ND	ND
10113	ND	ND	ND
10135	13 / 13	13 / 13	10 / 10
10147	ND	2	ND
10174A	ND	ND	ND
	16	**25**	**10**
Bedrock Wells			
3257	1	2	ND
5222	2	ND	ND
6209	1	ND	3
7120	ND	ND	ND
7205	ND	1	ND
8210	1	ND	ND
9205	ND	ND	ND
9210	2	1	ND
10205	2	ND	ND
10215	ND	ND	ND
10270	ND	ND	ND
10272	2	1	ND
10278	3	2	ND
10210A	3	1	4
10210B	2	ND	ND
10210C	1	ND	ND
10225A	5	1	ND
10225B	2	ND	ND
10225C	2	1	ND
	29	**10**	**7**
Total # of Detections	**45**	**35**	**17**

Notes:
44 - Number of parameters detected.
ND / ND - Duplicate analyses.
ND - No parameters detected at or above detection limits.

TABLE 3.3
SUMMARY OF COMPOUNDS DETECTED IN ALL WELLS
LOVE CANAL MONITORING 1999

Parameters	Location ID: / Collection Date: / Units	3151 06/09/99	3257 06/09/99	5222 06/18/99	6209 06/18/99	7132 06/09/99	7155 06/09/99	7205 06/09/99	8106 06/22/99	8110 06/09/99	8120 06/14/99	8130 06/16/99	8210 06/18/99	9115 06/14/99	9120 06/16/99
Volatiles															
Vinyl Chloride	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Acetone	µg/L	ND 10J	ND 10J	ND 10	ND 10	ND 10J	ND 10J	ND 10J	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10	ND 10
Carbon Disulfide	µg/L	8J	ND 10	ND 10	4J	ND 10	ND 10	12	ND 10	ND 10	ND 10	1J	1J	1J	ND 10J
1,1-Dichloroethene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Butanone	µg/L	ND 10J	ND 10J	ND 10	ND 10	ND 10J	ND 10J	ND 10J	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10	ND 10
Chloroform	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Trichloroethene	µg/L	ND 10	ND 10	3J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1,2-Trichloroethane	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Hexanone	µg/L	ND 10J	ND 10J	ND 10	ND 10	ND 10J	ND 10J	ND 10J	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1,2,2-Tetrachloroethane	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Toluene	µg/L	ND 10	1J	1J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Chlorobenzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Ethylbenzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Xylene(total)	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Trans-1,2-Dichloroethene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Semi-Volatiles															
Phenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
bis(2-Chloroethyl)ether	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Chlorophenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,4-Dichlorobenzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzyl Alcohol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2-Dichlorobenzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Methylphenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzoic Acid	µg/L	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	ND 10J	1J	ND 10J	ND 10J	ND 10J
2,4-Dichlorophenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2,4-Trichlorobenzene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Naphthalene	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Chloro-3-methylphenol	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Fluoranthene	µg/L	ND 10	ND 10	ND 10	ND 10	1J	ND 10	ND 10	ND 10	ND 10	ND 10J	ND 10J	ND 10	ND 10J	ND 10
Butylbenzylphthalate	µg/L	ND 10	1J	ND 10	ND 10	ND 10	ND 10	ND 10	2J	2J	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	ND 10	7J	ND 10	ND 10	1J	4J	ND 10	2J	ND 10	2J	ND 10	ND 10	1J	2J
Pesticides/PCBs															
alpha-BHC	µg/L	ND 0.050	ND 0.050J	ND 0.050J	0.036J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
beta-BHC	µg/L	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
delta-BHC	µg/L	ND 0.050	ND 0.050J	ND 0.050J	0.058J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
gamma-BHC (Lindane)	µg/L	ND 0.050	ND 0.050J	ND 0.050J	0.034J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Heptachlor	µg/L	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Aldrin	µg/L	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Heptachlor epoxide	µg/L	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
Endosulfan I	µg/L	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050	ND 0.050
4,4'-DDD	µg/L	ND 0.10	ND 0.10J	ND 0.10J	ND 0.10J	ND 0.10	ND 0.10	ND 0.10	ND 0.10J	ND 0.10	ND 0.10	ND 0.10	ND 0.10	ND 0.10	ND 0.10
Endosulfan sulfate	µg/L	ND 0.10	ND 0.10J	ND 0.10J	ND 0.10J	ND 0.10	ND 0.10	ND 0.10	ND 0.10J	ND 0.10	ND 0.10	ND 0.10	ND 0.10	ND 0.10	ND 0.10

Notes:
J Estimated.
JN Presumptively present at the associated estimated value.
NDx Not detected at or above x.
PCBs Polychlorinated Biphenyls.

TABLE 3.3
SUMMARY OF COMPOUNDS DETECTED IN ALL WELLS
LOVE CANAL MONITORING 1999

Parameters	Location ID: / Collection Date: / Units	9210 06/24/99	10135 06/16/99	10135 06/16/99 (Duplicate)	10147 06/16/99	10205 06/24/99	10210A 06/23/99	10210B 06/24/99	10210C 06/24/99	10225A 06/23/99	10225B 06/23/99	10225C 06/21/99	10272 06/16/99	10278 06/16/99
Volatiles														
Vinyl Chloride	µg/L	ND 10	62	61	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Acetone	µg/L	480	ND 41	ND 45	ND 10	320	ND 110	ND 54	2100	190	ND 70	ND 14	ND 10	ND 10
Carbon Disulfide	µg/L	ND 10	ND 10	2J	ND 10J	ND 10	ND 10	2J	ND 10	73	28	ND 10	2J	4J
1,1-Dichloroethene	µg/L	ND 10	4J	3J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Butanone	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	2J	ND 10	ND 10	2J	ND 10	ND 10	ND 10	1J
Chloroform	µg/L	ND 10	120	110	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Trichloroethene	µg/L	ND 10	70	58	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	10	ND 10	ND 10
Benzene	µg/L	ND 10	5600	5700	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1,2-Trichloroethane	µg/L	ND 10	15	12	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Hexanone	µg/L	ND 10	ND 10	ND 10	ND 10	ND 10	3J	ND 10	ND 10	8J	ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	ND 10	13	12	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1,2,2-Tetrachloroethane	µg/L	ND 10	32	29	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Toluene	µg/L	1J	16000	17000	ND 10	2J	2J	2J	ND 10	19	2J	1J	2J	2J
Chlorobenzene	µg/L	ND 10	1800	1900	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Ethylbenzene	µg/L	ND 10	10J	9J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Xylene(total)	µg/L	ND 10	43	44	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Trans-1,2-Dichloroethene	µg/L	ND 10	67	70	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Semi-Volatiles														
Phenol	µg/L	ND 10	120	96J	ND 10	ND 10	1J	ND 10	ND 10	2J	ND 10	ND 10	ND 10	1J
bis(2-Chloroethyl)ether	µg/L	ND 10	26J	25J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Chlorophenol	µg/L	ND 10	25J	ND 200	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,4-Dichlorobenzene	µg/L	ND 10	74J	61J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzyl Alcohol	µg/L	ND 10	540	680	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2-Dichlorobenzene	µg/L	ND 10	30J	24J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Methylphenol	µg/L	ND 10	35J	42J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	µg/L	ND 10	120	95J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzoic Acid	µg/L	ND 10	5000	4300	12J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3J	3J
2,4-Dichlorophenol	µg/L	ND 10	610	690	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2,4-Trichlorobenzene	µg/L	ND 10	65J	45J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3J	ND 10	ND 10
Naphthalene	µg/L	ND 10	2000J	1400J	3J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Chloro-3-methylphenol	µg/L	ND 10	33J	25J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	1J	ND 100	ND 200	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Fluoranthene	µg/L	ND 10	ND 100	ND 200	ND 10J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10J	ND 10J
Butylbenzylphthalate	µg/L	ND 10	ND 100	ND 200	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	ND 10	ND 100	ND 200	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Pesticides/PCBs														
alpha-BHC	µg/L	ND 0.050	37J	40	ND 0.050	ND 0.050J	0.28	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
beta-BHC	µg/L	ND 0.050	11J	12	ND 0.050	ND 0.050J	0.035J	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
delta-BHC	µg/L	ND 0.050	9.6J	11	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
gamma-BHC (Lindane)	µg/L	ND 0.050J	4.1J	5.5	ND 0.050	ND 0.050J	0.10J	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050
Heptachlor	µg/L	ND 0.050	0.68JN	0.63	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
Aldrin	µg/L	ND 0.050	0.21J	0.74JN	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
Heptachlor epoxide	µg/L	ND 0.050	0.058J	0.043J	ND 0.050	ND 0.050J	ND 0.050	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
Endosulfan I	µg/L	ND 0.050	0.43J	0.34J	ND 0.050	ND 0.050J	0.046J	ND 0.050	ND 0.050J	ND 0.050J	ND 0.050J	ND 0.050	ND 0.050	ND 0.050
4,4'-DDD	µg/L	ND 0.10	0.20J	0.21	ND 0.10	ND 0.10J	ND 0.10	ND 0.10	ND 0.10J	ND 0.10J	ND 0.10J	ND 0.10	ND 0.10	ND 0.10
Endosulfan sulfate	µg/L	ND 0.10	0.17J	0.18	ND 0.10	ND 0.10J	ND 0.10	ND 0.10	ND 0.10J	ND 0.10J	ND 0.10J	ND 0.10	ND 0.10	ND 0.10

:
Estimated.
Presumptively present at the associated estimated value.
Not detected at or above x.
Polychlorinated Biphenyls.

TABLE 3.4

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1999
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	***10210A***										***10210B***									
Sample Date:	7/24/90	8/22/91	8/26/92	8/11/93	5/25/95	7/1/96	7/10/97	6/26/98	6/23/99		7/24/90	8/22/91	8/26/92	8/11/93	6/15/94	6/1/95	7/5/96	7/1/97	6/18/98	6/24/99
Volatiles (ug/L)																				
Vinyl Chloride																				
Methylene Chloride																				
Acetone		14C			13B				120J				31		12B	23				
Toluene										2J										2J
1,1-Dichloroethane																				
1,2-Dichloroethene (total)																				
Carbon Disulfide						20	310												8J	2J
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		3								
bis(2-Ethylhexyl)Phthalate			12	21	31	51					7B	13		11				55	6J	
2,4-Dichlorophenol																				
2,4,5-Trichlorophenol																				
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																				

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1999
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	***10210A***										***10210B***									
Sample Date:	7/24/90	8/22/91	8/26/92	8/11/93	5/25/95	7/1/96	7/10/97	6/26/98	6/23/99		7/24/90	8/22/91	8/26/92	8/11/93	6/15/94	6/1/95	7/5/96	7/10/97	6/18/98	6/24/99
Semi-volatiles (cont'd) (ug/L)																				
Bis(2-Chloroethyl)Ether																				
2-Chlorophenol																				
Napththalene																				
4-Chloro-3-methylphenol																				
Pesticides/PCBs (ug/L)																				
Alpha-BHC										0.28										
Beta-BHC										0.035J										
Delta-BHC																				
Gamma-BHC (Lindane)										0.10J										
Heptachlor																				
Aldrin																				
Heptachlor epoxide																				
Endosulfan I										0.046J										
4,4'-DDD																				
Endosulfan Sulfate																				
Endrin																				

Notes:

B - Found in blank.
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.

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1999
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	***10210C***											***10135***							
Sample Date:	7/25/90	8/22/91	8/26/92	8/11/93	6/8/94	6/1/95	7/1/96	7/1/97	6/22/98	6/24/99		8/26/92	8/19/93	6/22/94	6/1/95	6/27/96	7/7/97	6/17/98	6/16/99
Volatiles (ug/L)																			
Vinyl Chloride																50		48J	62/61
Methylene Chloride													41			11			
Acetone				10B	23B	19B					2100		270	100B		60		110J	
Toluene												2700	1700E	21500BE	18000D	14000	9000/1700	16000J	6000/1700
1,1-Dichloroethane													15						4J/3J
1,2-Dichloroethene (total)												700	840			560		58J	67/70
Carbon Disulfide																			ND/2J
2-Butanone													5200						
Chloroform													100			110		150J	120/110
Trichloroethene													24			36		170J	70/58
1,1,2-Trichloroethane																14		29J	15/12
Benzene														6000E	4900D	4800	5600/5000	5300J	5600/5700
Chlorobenzene												2600	1700		2000D	1500	2300/ND	1900J	1800/1900
Xylene (total)													47	10B		28		55J	43/44
1,1,2,2-Tetrachloroethane													12			26		94J	32/29
Vinyl Acetate												6800		12B					
Ethylbenzene													13					12	10J/9J
Tetrachloroethene																		40J	13/12
2-Hexanone																			
Semi-volatiles (ug/L)																			
Pentachlorophenol													52						
Phenol			6				22		22				96	91	140				120/96J
bis(2-Ethylhexyl)Phthalate		7B	13		38								50						
2,4-Dichlorophenol												1200B	420	610	150		2100/2100	2000	610/690
2,4,5-Trichlorophenol													70					38J	
2-Methylphenol													51					55J	35J/42J
4-Methylphenol							29	110	62	0.6J			80					130J	120/95J
2-Chloronaphthalene															150				
Benzyl Alcohol															380		1900/1600	2700	540/680
Benzoic Acid															6400D	4000	0000J/2700	23000J	5000/4300
Di-n-Octyl Phthalate																			
Dimethyl Phthalate																			
1,2-Dichlorobenzene													35						30J/24J
1,4-Dichlorobenzene												110	94	91					74J/61J
1,2,4-Trichlorobenzene													74	87B				78J	65J/45J

TABLE 3.4

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1999
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	***10210C***											***10135***							
Sample Date:	7/25/90	8/22/91	8/26/92	8/11/93	6/8/94	6/1/95	7/1/96	7/1/97	6/22/98	6/24/99		8/26/92	8/19/93	6/22/94	6/1/95	6/27/96	7/7/97	6/17/98	6/16/99
Semi-volatiles (cont'd) (ug/L)																			
Bis(2-Chloroethyl)Ether													23					24J	26J / 25J
2-Chlorophenol																		28J	25J / ND
Napththalene																			2000J / 1400J
4-Chloro-3-methylphenol																			33J / 25J
Pesticides/PCBs (ug/L)																			
Alpha-BHC												84	42C	24CEP	28D	29	39 / 39	59	37J / 40
Beta-BHC															10D	11	8.1 / 8.6	12	11J / 12
Delta-BHC												15	9.8P	7.5CE	4.7	5.2	ND / 5.1	8.9	9.6J / 11
Gamma-BHC (Lindane)												33	19.5	20.4CE			13.2 / 14.8	6.5J	4.1J / 5.5
Heptachlor																			0.68JN / 0.63
Aldrin												0.53	0.24P						0.21J / 0.74JN
Heptachlor epoxide																			0.058J / 0.043
Endosulfan I																			0.43J / 0.34
4,4'-DDD																			0.020J / 0.21
Endosulfan Sulfate													0.43P						0.17J / 0.18
Endrin														0.15P					

Notes:

B - Found in blank.
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 3.5A

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

A WELLS

Well (1) / *Date*	*1144 (ft. AMSL)*	*1143 (ft. AMSL)*	*1142 (ft. AMSL)*	*1141 (ft. AMSL)*	*Tile Drain (ft. AMSL)*	*1140 (ft. AMSL)*
March-99	573.75	570.20	568.60	565.25	561.7	564.39
June-99	571.95	570.39	DRY	565.90	561.7	564.00
September-99	571.83	569.55	566.69	566.02	561.7	564.45
December-99	571.46	569.58	DRY	565.50	561.7	564.22

B WELLS

Well (1) / *Date*	*1144 (ft. AMSL)*	*1143 (ft. AMSL)*	*1142 (ft. AMSL)*	*1141 (ft. AMSL)*	*Tile Drain (ft. AMSL)*	*1140 (ft. AMSL)*
March-99	571.40	570.00	566.40	565.80	561.7	564.05
June-99	569.76	570.38	567.11	566.63	561.7	563.93
September-99	568.04	569.68	567.45	566.62	561.7	564.50
December-99	570.38	568.50	566.75	566.06	561.7	564.50

C WELLS

Well (1) / *Date*	*1144 (ft. AMSL)*	*1143 (ft. AMSL)*	*1142 (ft. AMSL)*	*Tile Drain (ft. AMSL)*
March-99	571.19	568.10	565.10	561.7
June-99	569.48	568.73	565.45	561.7
September-99	567.62	568.52	565.65	561.7
December-99	568.98	568.06	565.20	561.7

D WELLS

Well (1) / *Date*	*1144 (ft. AMSL)*	*1143 (ft. AMSL)*	*Tile Drain (ft. AMSL)*
March-99	567.10	565.95	561.7
June-99	568.40	567.17	561.7
September-99	567.49	567.27	561.7
December-99	566.58	566.72	561.7

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-99	567.02	571.36	567.36	561.85
June-99	567.08	568.11	567.36	561.85
September-99	566.66	567.34	566.93	561.85
December-99	566.67	570.21	567.21	561.85

B WELLS

Well (1)	*1154*	*1153*	*1151*	*Tile Drain*
Date	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*
March-99	567.63	568.57	567.68	561.85
June-99	567.26	568.32	567.69	561.85
September-99	567.02	567.46	567.08	561.85
December-99	568.03	568.80	567.78	561.85

C WELLS

Well (1)	*1154*	*1153*	*1151*	*Tile Drain*
Date	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*
March-99	567.53	568.98	569.27	561.85
June-99	567.73	569.24	568.88	561.85
September-99	567.36	568.67	567.47	561.85
December-99	567.96	569.08	567.87	561.85

D WELLS

Well (1)	*1154*	*1153*	*1151*	*Tile Drain*
Date	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*	*(ft. AMSL)*
March-99	568.91	569.11	571.96	561.85
June-99	568.36	569.99	569.26	561.85
September-99	567.89	569.58	569.55	561.85
December-99	568.06	569.19	570.46	561.85

E WELLS

Well (1)	*1153*	*Tile Drain*
Date	*(ft. AMSL)*	*(ft. AMSL)*
March-99	569.40	561.85
June-99	569.20	561.85
September-99	568.82	561.85
December-99	569.02	561.85

Note:
(1) Wells listed in order from most distant outside of tile drain, to tile drai 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) / *Date*	*10176 (ft. AMSL)*	*1165 (ft. AMSL)*	*1163 (ft. AMSL)*	*1162 (ft. AMSL)*	*1161 (ft. AMSL)*	*Tile Drain (ft. AMSL)*	*1160 (ft. AMSL)*
March-99	568.10	574.90	568.30	570.25	DRY	560.60	DRY
June-99	565.51	575.00	568.70	566.08	DRY	560.60	DRY
September-99	565.10	574.47	568.40	565.50	563.45	560.60	563.93
December-99	567.38	575.19	568.35	566.42	555.00	560.60	564.60

B WELLS

Well (1) / *Date*	*10176 (ft. AMSL)*	*1165 (ft. AMSL)*	*1163 (ft. AMSL)*	*1161 (ft. AMSL)*	*Tile Drain (ft. AMSL)*
March-99	567.70	578.75	DRY	565.91	560.60
June-99	565.22	579.05	564.93	566.84	560.60
September-99	565.09	578.80	569.20	566.19	560.60
December-99	567.26	579.01	564.10	566.46	560.60

C WELLS

Well (1) / *Date*	*10176 (ft. AMSL)*	*1165 (ft. AMSL)*	*1163 (ft. AMSL)*	*1162 (ft. AMSL)*	*1161 (ft. AMSL)*	*Tile Drain (ft. AMSL)*	*1160 (ft. AMSL)*
March-99	565.49	579.30	570.19	568.75	577.50	560.60	DRY
June-99	564.39	579.77	570.57	569.79	578.99	560.60	565.30
September-99	564.86	578.65	569.65	569.08	568.15	560.60	565.94
December-99	564.80	579.06	569.25	569.08	568.15	560.60	565.80

D WELLS

Well (1) / *Date*	*10176 (ft. AMSL)*	*1165 (ft. AMSL)*	*1163 (ft. AMSL)*	*1162 (ft. AMSL)*	*1161 (ft. AMSL)*	*Tile Drain (ft. AMSL)*
March-99	562.70	576.80	DRY	566.74	568.70	560.60
June-99	563.11	577.50	569.36	570.99	569.36	560.60
September-99	563.60	576.78	568.90	570.62	568.90	560.60
December-99	563.45	576.53	DRY	570.17	568.38	560.60

E WELLS

Well (1) / *Date*	*1161 (ft. AMSL)*	*Tile Drain (ft. AMSL)*
March-99	564.91	560.60
June-99	565.63	560.60
September-99	564.61	560.60
December-99	564.31	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) / *Date*	*1174* *(ft. AMSL)*	*1173* *(ft. AMSL)*	*1172* *(ft. AMSL)*	*1171* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1170* *(ft. AMSL)*
March-99	576.17	567.38	567.43	563.47	555.60	562.68
June-99	575.67	567.14	567.03	563.37	555.60	561.88
September-99	575.71	567.29	566.66	563.02	555.60	561.83
December-99	575.69	567.50	566.03	563.67	555.60	562.48

B WELLS

Well (1) / *Date*	*1174* *(ft. AMSL)*	*1173* *(ft. AMSL)*	*1172* *(ft. AMSL)*	*1171* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1170* *(ft. AMSL)*
March-99	577.63	568.56	567.92	562.53	555.60	560.76
June-99	567.98	567.91	568.46	562.96	555.60	560.58
September-99	575.31	568.73	568.16	562.20	555.60	561.07
December-99	574.83	568.80	568.67	562.63	555.60	561.56

C WELLS

Well (1) / *Date*	*1174* *(ft. AMSL)*	*1173* *(ft. AMSL)*	*1172* *(ft. AMSL)*	*1171* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*
March-99	575.74	571.30	567.72	561.56	555.60
June-99	576.89	570.93	567.99	561.28	555.60
September-99	574.84	570.05	567.29	561.46	555.60
December-99	574.62	569.91	568.14	562.34	555.60

D WELLS

Well (1) / *Date*	*1174* *(ft. AMSL)*	*1173* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*
March-99	571.88	572.49	555.60
June-99	571.30	570.90	555.60
September-99	571.35	570.00	555.60
December-99	572.08	570.40	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-99	563.98	565.59	566.96	560.00	565.81
June-99	563.61	565.82	566.57	560.00	562.99
September-99	562.88	566.09	565.66	560.00	562.34
December-99	562.68	565.19	566.75	560.00	562.59

B WELLS

Well (1) / *Date*	*1184* *(ft. AMSL)*	*1183* *(ft. AMSL)*	*1181* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1180* *(ft. AMSL)*
March-99	565.09	565.14	568.05	560.00	561.19
June-99	565.11	565.05	566.81	560.00	561.17
September-99	561.84	564.44	566.10	560.00	560.62
December-99	561.49	564.34	566.70	560.00	560.92

C WELLS

Well (1) / *Date*	*1184* *(ft. AMSL)*	*1183* *(ft. AMSL)*	*1181* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1180* *(ft. AMSL)*
March-99	569.10	568.01	568.07	560.00	DRY
June-99	564.42	567.46	568.23	560.00	DRY
September-99	DRY	566.21	567.44	560.00	DRY
December-99	DRY	567.21	569.47	560.00	DRY

D WELLS

Well (1) / *Date*	*1184* *(ft. AMSL)*	*1183* *(ft. AMSL)*
March-99	568.79	566.88
June-99	563.59	567.08
September-99	DRY	566.88
December-99	DRY	566.63

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

TABLE 3.5F

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

A WELLS

Well (1) / *Date*	*1194* *(ft. AMSL)*	*1193* *(ft. AMSL)*	*1192* *(ft. AMSL)*	*1191* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1190* *(ft. AMSL)*
March-99	564.20	564.87	564.03	565.21	554.80	565.83
June-99	564.30	564.67	563.43	565.80	554.80	562.73
September-99	562.72	564.45	562.48	565.13	554.80	562.91
December-99	563.25	564.62	562.88	564.64	554.80	569.19

B WELLS

Well (1) / *Date*	*1194* *(ft. AMSL)*	*1193* *(ft. AMSL)*	*1192* *(ft. AMSL)*	*1191* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*	*1190* *(ft. AMSL)*
March-99	569.92	567.55	567.68	565.30	554.80	563.02
June-99	568.92	567.65	567.74	565.79	554.80	563.11
September-99	567.23	567.91	567.53	565.77	554.80	563.07
December-99	568.53	567.85	567.31	565.07	554.80	563.17

C WELLS

Well (1) / *Date*	*1194* *(ft. AMSL)*	*1193* *(ft. AMSL)*	*1192* *(ft. AMSL)*	*1191* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*
March-99	570.66	570.50	569.25	563.78	554.80
June-99	570.41	569.50	569.75	563.23	554.80
September-99	568.64	569.57	569.20	563.78	554.80
December-99	570.76	569.70	568.63	563.56	554.80

D WELLS

Well (1) / *Date*	*1194* *(ft. AMSL)*	*1193* *(ft. AMSL)*	*Tile Drain* *(ft. AMSL)*
March-99	572.94	570.20	554.80
June-99	571.22	570.60	554.80
September-99	569.37	570.05	554.80
December-99	571.89	570.20	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

1999 LOVE CANAL SYSTEM REPAIRS
OCCIDENTAL CHEMICAL CORPORATION
GLENN SPRINGS HOLDINGS, INC.
MILLER SPRINGS REMEDIATION MANAGEMENT, INC.

- Completion of installation from prior year (1998) of new process control software program (Fix-32 from Intellution).
- Computer system control upgrades completed for new parameters at 102nd Street Landfill site.
- Completion of linking the 102nd Street landfill leachate line into the Love Canal treatment system (PC-3).
- Clean out of wet wells PC-1, PC-2, PC-3 (storage tank and wet well) and PC-3A (six chamber system and wet well).
- Well PC-1: New submersible pump and minor piping changes were done in the wet-well, upgraded from a dry chamber pump system to a submersible.
- Well PC-2: New submersible pump and minor piping changes were done in the wet-well, upgraded from a dry chamber pump system to a submersible.
- Well PC-2A: Replacement of the pump and motor (bearings in motor and pump).
- Clarifier clean out and inspection of wall integrity.
- Clarifier upgrades of the NAPL transfer line to NAPL storage tank, which included isolation valves and a clean out flange.
- Clarifier re-piping and upgrade to stainless lines within the clarifier system airlift station for NAPL transfer.
- Carbon Transfer Tank, replacement of bottom discharge valve.
- Main Carbon Bed, replacement of bottom discharge valve.
- Replaced level indicators in wet wells (PC-1,PC-2,PC-3,PC-1A,PC2A & PC3A) with new 4-20 ma submersible transducer.
- Back Flow Preventers inspected and serviced.
- Seal and check valve replaced on PC-2 pump.
- Compressors inspected and serviced. Solenoids check valve replaced on water-cooling line.
- City water meter inspected and verified.

LOVE CANAL
1999 ANNUAL REPORT

Miller Springs Remediation Management, Inc.
Niagara Falls, New York

FOREWORD

The 1999 Love Canal Annual Report is submitted pursuant to Section 2.C. of Appendix B of the Consent Judgment between Occidental Chemical Corporation (OCC) and the State of New York, effective October 7,1994. It covers those developments and activities that occurred in the 1999 calendar year. This is the fifth Annual Report issued by OCC. Annual Reports prior to the 1995 calendar year were issued by the New York State Department of Environmental Conservation (NYSDEC).

Effective July 1, 1998 site operational responsibility for the Love Canal site was assigned by Occidental Chemical Company to Miller Springs Remediation Management, Inc. (MSRM), a Glenn Springs Holdings, Inc. (GSHI) affiliate. GSHI is a subsidiary of Occidental Petroleum Corporation.

For further information regarding the developments and activities at Love Canal, please contact:

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Glenn Springs Holdings, Inc.
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Lexington, KY 40509
Phone: (606) 543-2159

Or

Donald R. Tubridy
Site Manager
Miller Springs Remediation Management, Inc.
805 97th Street
Niagara Falls, NY 14304
Phone: (716) 283-0112

SUMMARY

Responsibility for site operations and control passed from the NYSDEC to OCC on January 5, 1995; MSRM currently manages the site on behalf of OCC. The Site has been reclassified by the NYSDEC as Class 4 since January 12, 1995; this classification applies to a site that has been properly closed and requires continued management. Operations and activities in 1999 were routine in nature. The collection system has maintained inward gradients and has been effective in preventing chemical migration. The treatment facility has met all conditions of the sewer use discharge permit.

LOVE CANAL LEACHATE COLLECTION AND TREATMENT

The City of Niagara Falls issued a wastewater discharge permit to Occidental Chemical Corp on January 5, 1995. In 1998 the permit was modified to include the treatment of leachate water from the 102nd Street Landfill. In March of 1999, a modification to the discharge permit was granted to accommodate additional flow from the 102nd Street Site; maximum flow was increased from 100,000 gallons/day to 300,000 gallons/day. In March of 1999 leachate began pumping from 102nd Street into the Love Canal collection system in the south end of the facility. The four-well system at 102nd Street transferred a total of 1,778,200 gallons to Love Canal (PC3) were it was then batch treated along with the Love Canal ground water.

The Love Canal Leachate Treatment Facility met all discharge requirements of the City permit during the year. The leachate collection system continued to function as designed, drawing groundwater toward the underground drain system from both the landfill and the surrounding area beyond the cap.

1999 LOVE CANAL TREATMENT FACILITY

- Treated 4,372,300 gallons of groundwater, including 1,778,200 gallons from the 102nd Strret Landfill.

- Shipped 2,574 gallons of NAPL off-site for disposal.

OPERATION AND MAINTENANCE ACTIVITIES

During 1999, the following operation and maintenance activities were performed.

- Completion from prior year (1998) of a new process control software program (Fix-32 from Intellution).
- Computer system control upgrades completed to include the 102nd Street Landfill site.
- Clarifier clean out and inspection of wall integrity.

- Clarifier upgrades of the NAPL transfer line to NAPL storage tank, which included isolation valves and a clean out flange.
- Clarifier re-piping and upgrade to stainless steel lines within the clarifier system airlift station for NAPL transfer.
- Replacement of bottom discharge valves on one Main Carbon Bed and the Carbon Transfer Tank.
- Completion of linking the 102nd Street landfill leachate line into the Love Canal treatment system (PC-3).
- Clean out of wet wells PC-1, PC-2, PC-3 (storage tank and wet well) and PC-3A (six chamber system and wet well).
- Well PC-1: Upgraded from a dry chamber pump system to a submersible pump. New submersible pump and minor piping changes were done in the wet-well;
- Well PC-2: Upgraded from a dry chamber pump system to a submersible pump. New submersible pump and minor piping changes were done in the wet-well;
- Well PC-2A: Replacement of the pump and motor (bearings in motor and pump).
- Replaced level indicators in wet wells (PC-1, PC-2, PC-3, PC-1A, PC2A & PC3A) with new submersible transducers.

THE LONG-TERM MONITORING PROGRAM

The Long-Term Monitoring Program examines hydrogeologic and chemical data from the Love Canal area in order to evaluate the overall effectiveness of the containment system. In 1999 one round of samples was collected from 39 long-term monitoring wells that surround the site. Quarterly groundwater elevations were taken in six groups of piezometers located around the site.

The 1999 data is similar to previous data gathered from 1989 to 1998, indicating that the barrier drain is functioning as designed. Both the hydrological and chemical evidence support this conclusion.