2004 OPERATION/MONITORING REPORT
OCCIDENTAL CHEMICAL CORPORATION

LOVE CANAL SITE

NIAGARA FALLS, NY

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), an affiliate of Occidental Chemical Corporation. This report is the ninth annual report prepared by or on behalf of OxyChem and covers operating and monitoring activities for 2004.

Love Canal Site.
Located South East end in the City of Niagara Falls, NY, eighth mile north of the Niagara River.

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 sludge was found in Manhole 6B (Second Manhole North of PC2A) within the Northwest section of the collection system. The manhole and the flumes of the manhole were flushed of residual build-up.

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. A renewal of the permit was submitted and approved by the city of Niagara Falls. The new permit is valid from January 6, 2005 through January 6, 2010.

One carbon bed, (V1, 20,000 lbs. of activated carbon), was changed during 2004. An internal visual inspection of the bed was performed at the time of the change. No additional maintenance or repairs were required at this time.

Routine maintenance activities were performed throughout the year. The major activities are presented below (see attached Table 4.1 for a detailed list of Site activities for the year 2004):

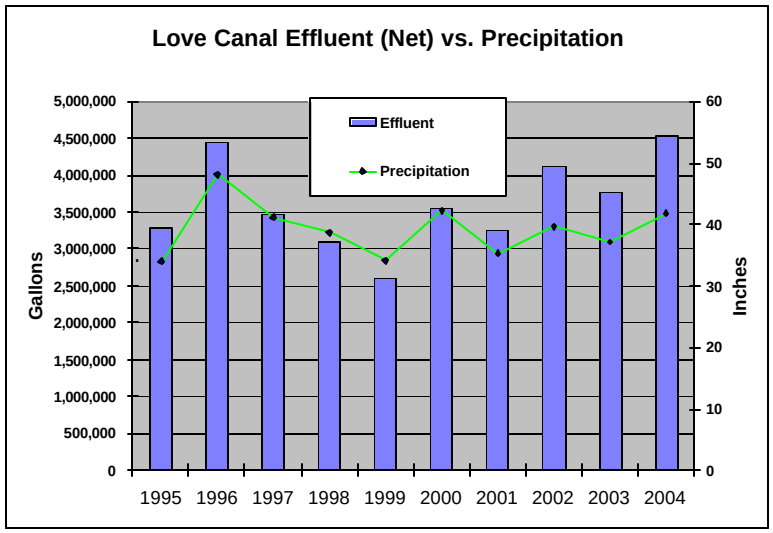
- Replacement of PC3 rail pumps with submersible pumps (Gorman Rupps), which eliminates pump-related confined space entry and standardizes the Site's pumps.

3.1.2 Effluent Discharge

The LCTF discharged to the Niagara Falls sanitary sewer system on 128 days in 2004.

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, two requests 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): 5,003,600 gallons
- Total pumped from 102nd Street Site: 474,251 gallons
- Net Love Canal Collection: 4,529,349 gallons



Effluent Discharge

Net gallons vs. Annual Precipitation (inches), from 1995 to present.

Table 3.1 shows the monthly total and average treated groundwater quantities for the 1995 to 2004 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 416,967 gallons to Love Canal (PC3), where the water was then treated along with groundwater accumulated on the Site.

3.1.3 Sampling

Sampling of the effluent discharged 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, the 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 the City's permitted limits for the sampled parameters during all events.

3.1.4 Precipitation

Precipitation in the Niagara Falls region totaled 41.73 inches (Buffalo Airport, National Weather Service data), compared to the average of 39.2 inches (1995 through 2004). 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" (LTGMP) dated January 1996.

3.2.2 Chemical Monitoring

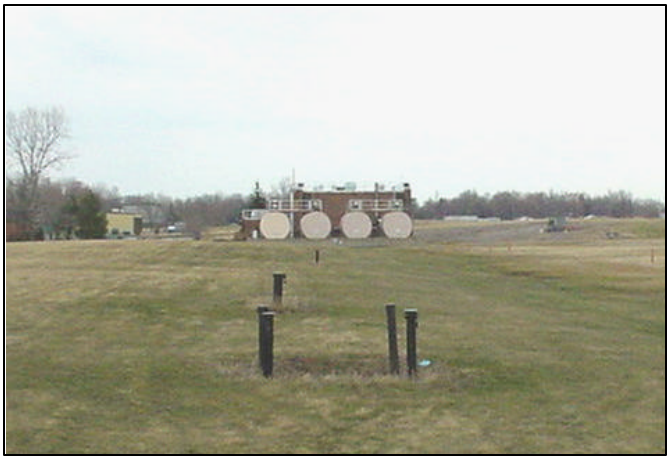
The chemical sampling event was performed during the second quarter of 2004. In conjunction with the LTGMP and NYSDEC thirty-one (31) wells were designated for groundwater monitoring in 2004. Thirty-four (34) groundwater samples (including three field duplicates) were collected in support of the LTGMP for the Love Canal Site. During the monitoring events NYSDEC obtained six split samples. Figure 3.1 identifies the wells sampled and their locations. Table 3.2 provides a summary of the wells – thirteen (13) overburden

and eighteen (18) bedrock – that were sampled, along with the number of compounds found at or above the detection limits in each well.

Table 3.3 presents the analytical results from the annual monitoring and the analytes that were detected. There were eighteen (18) discrete compounds detected: eight (8) VOCs; five (5) semi-volatile organic compounds (SVOCs); and five (5) pesticides.

Well 10135, which historically has had the most detected compounds and highest concentrations, had shown no detection of any compounds this sampling round. Well 10135 is located within the boundaries of the remedial Site in the southwestern zone and groundwater in the vicinity of this well is captured by the collection system. It is likely that the lack of detections was due to either a sampling or laboratory error but none was evident. This well will be sampled again in 2005.

Table 3.4 presents a summary of detected compounds of four long-term monitoring wells (10210A, 10210B, 10210C, and 10135) from 1990 to 2004. This data shows that the compounds detected in 2004 were at similar concentrations to those compounds detected in previous years except for well 10135.



Monitoring Wells

1165 series and 10135 well in back ground. View from Southwest of the Site looking North.

As part of the sampling event and as part of the lab quality assurances three (3) field duplicate samples, two (2) field blanks and a rinse blank were obtained. Rinse blanks were collected and analyzed with the samples. All field duplicates showed acceptable comparability with the original sample results indicating acceptable analytical and field precision. Generally, field blank results were non-detect with the exception of some VOCs, SVOCs, and pesticides present at low levels. All

sample results with similar concentrations as in the blanks were qualified as non-detect.

Ecology and Environment, Inc. (E&E), located in Lancaster, New York, conducted the sample analyses. Conestoga-Rovers & Associates (CRA), located in 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-99/008, October 1999.

The QA/QC evaluation concluded all data were judged acceptable with the qualifications noted in the report.

The 2004 chemical analytical results are consistent with previous Long-Term Monitoring analytical results. The chemistry detected was at low levels and does not indicate a failure in the barrier drain nor 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, June, August, and October 2004. Figures 3.2 to 3.7 show the overburden groundwater flow conditions for June 2004 along the six-piezometer strings. The wells in the figures are 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. 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.

3.2.4 Well Maintenance

No maintenance was required of the Love Canal monitoring wells for 2004. In 2003, an inventory of Site's monitoring wells (hydraulic and chemical) was initiated. This inventory was completed in 2004 and a consensus between NYSDEC and MSRM on an active well list was compiled. The active wells list was developed based on the LTGMP and the well's relevance to the current on Site monitoring program. The wells were located, painted and labeled, and coded to identify chemical monitoring and hydraulic monitoring wells. The efforts of this task are attached as *Appendix-A*, which summarizes the active wells and the wells proposed to be decommissioned. Listed in Table 1.0 of *Appendix-A* are the active wells (wells as part of the LTGMP). Listed in Table 2.0 are the inactive wells (wells that were not part of any sampling event and are proposed to be decommissioned). Summarized below are total wells active and inactive. Additionally attached within *Appendix-A* is Figure 1.0 that presents the locations of wells that are proposed to be decommissioned.

Wells Active: 153 (133 Overburden and 20 Bedrock)

Wells Inactive: 62 (54 on Site, 8 off Site)
Additional: 9 (Non-identified wells located on Site)

Total of: 71 Identified and Non-Identified Wells proposed for decommissioned.

4.0 OTHER ACTIVITIES

Summaries of normal activities and repairs performed in 2004 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:

- Replacement of PC-3 rail pumps with submersible pumps.
- Maintenance on the Barrier Drain Collection system as noted in Section 2.1.1.
- Idle outside NAPL Storage Tanks removed. The four 10,000 gallon tanks were cut using cutting torches. The tank metal was either sent off Site to a secure landfill (mostly inner tanks) or scrapped (outer shell) by contractor performing the task. The cement tank cradles will be addressed in the upcoming year.

4.2 NON-PROCESS ACTIVITIES

Activities that occurred throughout the year included the following:

- The coarse stone around the side of landfill surrounding the Treatment Building was removed. The stones were removed and layer of topsoil was installed and seeded. This task was similar to that of the Northern slope of the Site along Colvin Blvd., which was performed in 2003.

4.3 COMMUNITY OUTREACH

Community Outreach programs during 2004 included such activities as beautification of the neighborhood and tours of the facility.

4.3.1 Beautification

- Additional planting of twenty-four (24) mature evergreens along 95th Street.
- Maintenance and landscaping of the Site and surrounding areas.
- Maintenance of flowerbeds and shrubs along Colvin Boulevard, 95th Street and Frontier Avenue.
- Cleanup of discarded debris around fence line and adjacent lots.

4.3.2 Tours

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 an informational orientation, accompanied with visual aids, followed by a guided tour of the treatment facility and landfill.

4.3.3 Communications

The United States Environmental Protection Agency (EPA) deleted the Love Canal Superfund Site from the National Priorities List (NPL) on September 30, 2004. The EPA and NYSDEC, have determined that all appropriate response actions have been implemented at the Love Canal site and that no further response actions, other than operation, maintenance and monitoring, are required. In addition, EPA and NYSDEC have determined that remedial action taken at the Love Canal site is protective of public health and environment and that the operation, monitoring and maintenance of such remedial action will confirm that it continues to be protective of public health and the environment.

The City of Niagara Falls performed the semi-annual inspections of the Site's Treatment Facility in February and July of 2004. The inspections conclude that the Site was running properly in accordance with the Site's discharge permit.

The wastewater discharge permit renewal was submitted to the City of Niagara Falls in December of 2004. The renewed permit will take effect January 06, 2005, and will be good until January 06, 2010.

The Annual Report for 2003 was issued to 24 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 73,623 pounds of hazardous waste were generated from various activities on Site. The waste materials were then sent off-Site for proper disposal in accordance with all applicable laws and regulations (landfilled, incinerated or reclaimed depending on categorization). All of this waste in 2004 was sent for incineration.

Roll-Off Bins

Used to Ship out Bulk Spent Carbon for Incineration.

The waste was categorized as follows:

- Spent carbon used in the treatment process totaled 34,840 pounds.
- Debris / filters / Personal Protective Equipment (PPE) / Misc. Equipment totaled 17,200 pounds.
- NAPL (sediment / sludge from process cleanout) totaled 21,583 pounds.

5.0 CONCLUSION

The 2004 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. 5,003,600 gallons of leachate were treated and discharged from the Site, of which 4,529,349 gallons of leachate were collected on-Site and the remaining 474,251 gallons were pumped from the 102nd Street Site.