

## 2021 Hazardous Waste Scanning Project

### File Form Naming Convention.

*(File\_Type).(Program).(Site\_Number).(YYYY-MM-DD).(File\_Name).pdf*

*Note 1: Each category is separated by a period "."*

*Note 2: Each word within category is separated by an underscore "\_"*

Specific File Naming Convention Label:

Report, HW, 932020, 1991-05-01, 1990-Annual-Report.pdf

*1990 Love Canal Annual Report*

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## 1990 LOVE CANAL ANNUAL REPORT

### SUMMARY

1990 marked another year of progress for the Department of Environmental Conservation (DEC) in its efforts and commitment to operate and maintain the Love Canal Inactive Hazardous Waste Site. Numerous activities took place both within the Love Canal Containment Facility and in the surrounding Emergency Declaration Area (EDA). The following major initiatives took place in 1990:

#### Love Canal Containment Facility

- \* 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.
- \* The Long Term Monitoring System supports the conclusion that the barrier drain system is functioning as designed. This conclusion is reflected in both the hydrological and chemical evidence.
- \* The Love Canal Leachate Treatment Plant's discharges met all the operating requirements of the Sewer Use Ordinance during the year.

#### Emergency Declaration Area

- \* The investigation of two lots with relatively higher levels of BHC contamination in EDA 4 was undertaken and completed. The data will be evaluated and the problem addressed, if necessary, in 1991.
- \* What is believed to be historic contamination was discovered in the pipe bedding of the Frontier Avenue storm sewer. An aggressive investigation of this discovery was initiated and is ongoing.
- \* 97th Street Methodist Church Phase II investigation was completed. No contamination was found, therefore, the church area has been removed from the State's Registry of Inactive Hazardous Waste Disposal Sites.
- \* The United States Environmental Protection Agency is reviewing the remedial alternatives for the 93rd Street School. New options under consideration will include excavation and off-site disposal of the contaminated material.
- \* Mapping of Areas 2 and 3 was completed. The sampling report for the remediation of EDA 2 and 3 was received and a feasibility study including a cost analysis of the remedial alternatives is being conducted.

## REMEDIAL PROJECTS

### EDA Neighborhood Area Number 4 Soil Investigation

Based on a recommendation by the Habitability Study Peer Review Panel to further study the elevated levels of benzene hexachloride (BHC) in Area 4 of the EDA (EDA 4), NYSDEC hired an Engineering Consultant, Ecology and Environment (E&E), to conduct a more localized soil investigation. Thirty-one soil borings were taken in EDA 4. The borings, after being separated into one foot samples, were analyzed for pesticides, particularly the beta isomer of benzene hexachloride (B-BHC). The analytical report received from E&E identified two lots, 1044 100th Street and 9909 Black Creek Drive, with elevated B-BHC levels. The New York State Department of Health (NYSDOH) determined that these two lots required additional investigation. As a result, E&E performed a second round sampling of these lots and adjacent areas in 1990. This additional sampling defined the limits of the elevated BHC levels. The preliminary results of this sampling and E&E's Draft report summarizing the data were received on December 18, 1990. The report indicated that the higher levels of B-BHC are limited primarily to the two lots previously identified.

Recently, NYSDEC has tasked ABB Environmental Services (ABB) to develop the remediation plan for the two EDA 4 lots. The design work will start after the report on soil sampling results is finalized and the State determines the extent of remediation necessary for the lots.

### Frontier Avenue Storm Sewer Excavation In The Southern Drainage Basin Of The EDA

Frontier Avenue is located along the southern boundary of the Love Canal Emergency Declaration Area. Remedial construction work performed in 1990 at the intersection of Frontier Avenue and 100th Street discovered contamination in storm sewer pipe bedding. It was determined that the contamination came from previous migration of wastes from the Love Canal site prior to initial remediation. Earlier work to address this situation has included the installation of various pipe bedding and trench cutoff walls which isolate the contaminants and stop further migration. However, until recently, it had not been proven that contaminants in the pipe bedding had migrated beyond the new cutoff wall at the intersection of 100th street and Frontier Avenue (See Figures 1 & 2).

This past summer during the installation of an additional cutoff wall at the upstream (west) side of manhole 412, contamination was discovered in the storm sewer pipe bedding. Based upon that discovery, four test pits were excavated downstream (east) of manhole 412 to manhole 406 (located between 100th and 101st Streets) and one immediately south of manhole 406 to provide a limited indication of the extent of migration. Additional contamination was discovered in the pipe bedding in

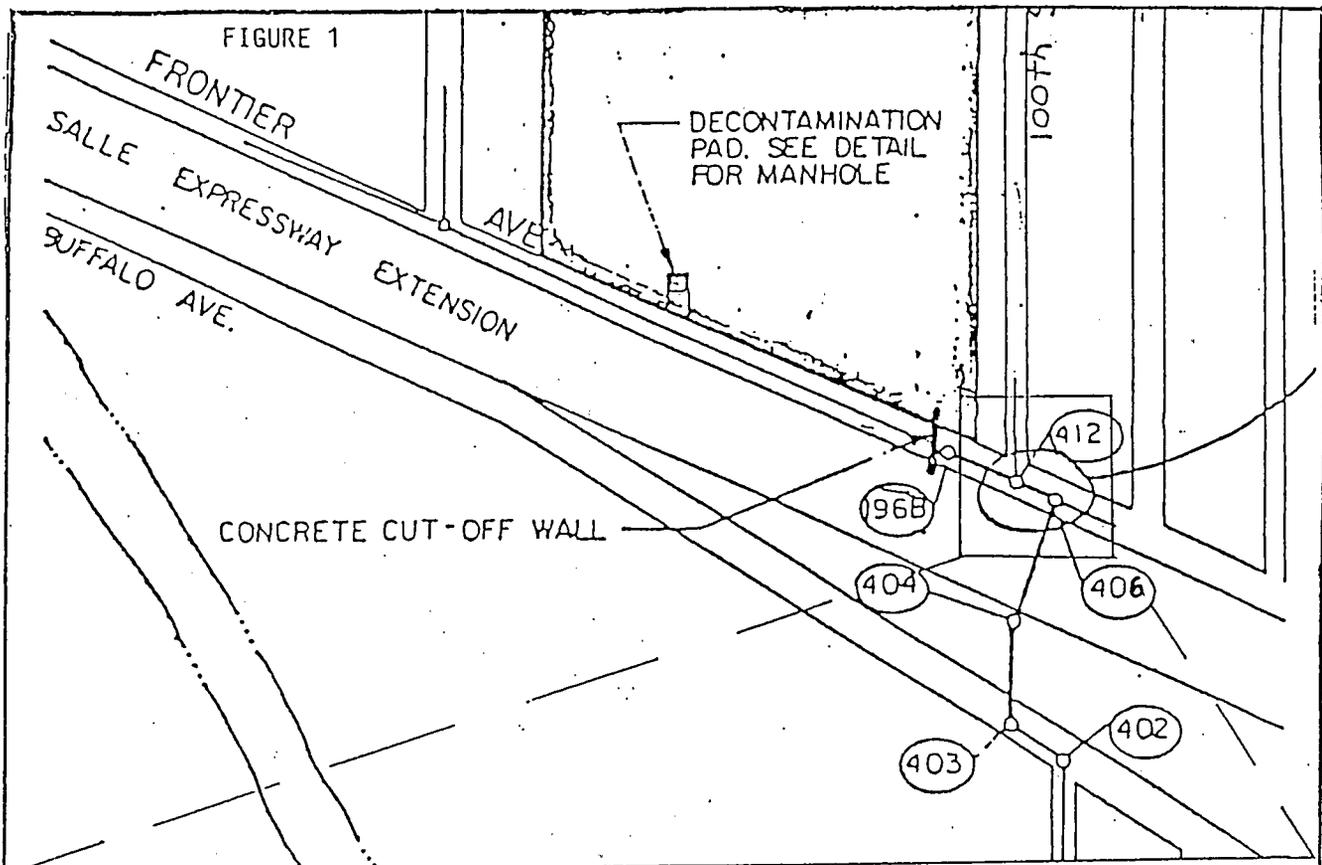
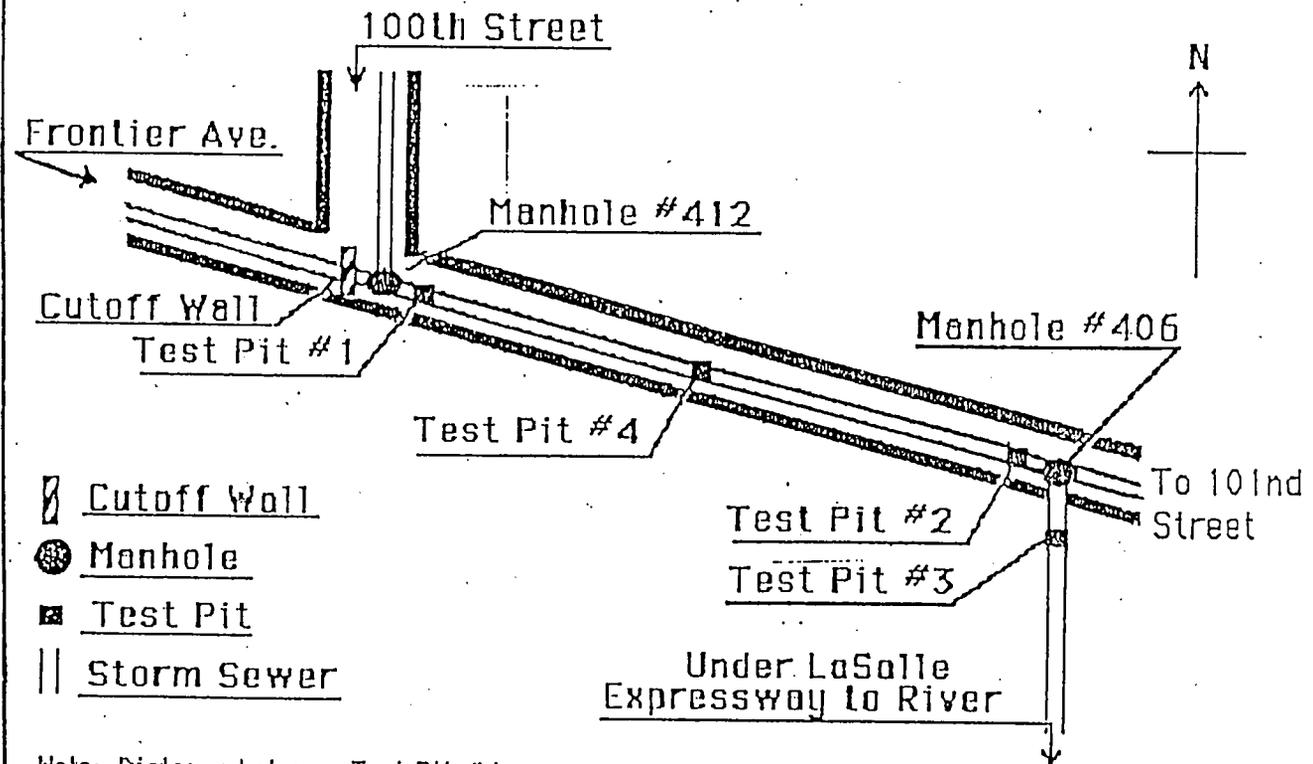


Figure - 2 Not To Scale

Frontier Avenue Investigation



-  Cutoff Wall
-  Manhole
-  Test Pit
-  Storm Sewer

Note: Distance between Test Pit #1 and Test Pit #4; and between Test Pit #4 and Test Pit #2 is about 85 feet.

three of the four test pit excavations including the #3 pit on the downstream (south) side of manhole 406.

In 1991, the NYSDEC consulting engineer, ABB, will be digging additional test pits to determine the extent of the contaminant migration in the storm sewer pipe bedding. Once completed, a remedial action will be evaluated with a schedule to complete necessary construction during the 1991 construction season.

#### **97th Street Methodist Church**

Sample collection and field work for the Phase II Investigation at this site was completed by E&E and a report was received October 29, 1990. The investigation found no evidence of hazardous waste disposal at the site. The report recommends "No Further Action". The site was de-listed on January 9, 1991.

#### **93rd STREET SCHOOL SITE**

The Niagara Falls Board of Education (NFBE) expressed concern with the selected remedy since it was felt that utilizing the building for a future school would not be accepted by the public if the waste remained on the school property. The Board felt it would be very difficult to reopen the school if the waste was not removed from the site. During the Technical Review Committee meeting in March 1990, DEC and EPA agreed to consider the Board's request.

DEC and EPA are evaluating another alternative consisting of removal of waste from the site. USEPA anticipates issuing a ROD Amendment by May 1991.

The Treatability Study report for the soil solidification/stabilization process was prepared by the Department's consultant Loureiro Engineering Associates. The report was sent to EPA for review and comment; however, further action was deferred pending the reevaluation of the off-site disposal alternative.

#### **BLACK AND BERGHOLTZ CREEKS REMEDIATION CONTRACT**

Sevenson Environmental Services, Inc. (SES) completed the restoration work under this contract on June 15, 1990.

Continued implementation of the Consent Decree with OCC includes the demolition of the OCC Bagging Facility and Dewatering Facility, and the removal of sludge from on-site storage tanks in 1991.

## EDA Neighborhoods 2 and 3

A draft report has been developed by the State which investigates a soil removal option. The States consultant, ABB, has provided survey maps and is currently developing feasibility and costs associated with a soil removal option.

### Leachate Holding Tank Access Contract

This contract was awarded to Firstrhyme Construction Corporation on September 25, 1989. The scope of the work involved the installation of manholes for access to a leachate holding tank located immediately west of the leachate treatment facility. These manholes are needed to provide access for inspection and periodic cleaning of the tank's six individual concrete cells. Also included under this contract was work involving re-routing a portion of the Frontier Avenue storm sewer, cleaning the sewer and installing a cutoff wall to prevent potential contaminant migration. (See Frontier Avenue Sewer Excavation Segment.) The contract was substantially completed on August 6, 1990.

### MAJOR OPERATION AND MAINTENANCE ACTIVITIES

The leachate treatment facility has continued to meet all the requirements of its discharge permit. The discharge permit has been renewed until July 1995.

A Pump and Electrical Project began in April and is expected to be complete in 1991. New field pump control starters and wires were installed to replace the 1979 originals. Advanced flow metering and level controls were also installed. All field pump controls will be computer automated.

All similar field pumps in the north and central portions of the site have been put on a rotating preventative maintenance schedule. During 1990, pumps were re-built in four of the six wells.

An annual review of the Love Canal Contingency Plan took place in September 1990. The primary objectives of the review was familiarization with emergency response procedures and to update the plan where applicable. Albany staff and permanent site staff, Niagara Falls Police and Fire Departments toured the site and reviewed the Plan relative to their respective disciplines. The plan has been revised to incorporate the changed site conditions.

In order to detect any settlement of the cap an updated topographic survey of the Love Canal containment facility is scheduled for completion by ABB in the spring of 1991. The survey was begun in May 1990 with aerial photos being taken of the site. The preparation of contour portions of the maps has been completed.

## PUBLIC PARTICIPATION

In 1990 the Love Canal Public Information Office (PIO) continued in its many roles. Primary among these roles is fulfilling its Citizen Participation mission to Niagara Falls area residents. As the primary outlet for information concerning the Department's remediation efforts in the Love Canal area, the PIO provided over 1200 visitors with an overview of the general history, past remedial work and the current status of the Emergency Declaration Area.

A number of activities in 1990 were undertaken to provide information and obtain comments from area residents regarding ongoing remediation efforts. These activities included responding to requests for information, complaints, Technical Review Committee meetings, writing, producing and mailing the "Love Canal Update" and providing tours for government officials and the public including visitors from: Canada, Venezuela, Finland, England, Germany, Japan, Western Australia, Taiwan and the Republic of China. Additionally, this office's responsibilities have been expanded to include citizen participation activities for all Occidental Chemical sites in Niagara County.

## The Results Of The Long Term Monitoring System

The Long Term Monitoring Program examines hydrological and chemical data from the Love Canal area in order to evaluate the overall effectiveness of the containment system. The reader is referred to the 1989 Love Canal Annual Report for a general background discussion of geological and hydrological considerations at the site.

In 1990, one round of samples was collected from the long term monitoring wells that surround the site. Included in the sampling program were selected wells on the west side of the Dewatering Containment Facility (DCF). Approximately bi-monthly, groundwater elevations are taken in six groups of wells located around the site.

The basic conclusion from the 1990 data is that they are similar to 1989's, and support last years conclusion that the barrier drain is functioning as designed. This conclusion is supported by both the hydrological and chemical evidence.

An inventory of groundwater monitoring wells in the EDA was conducted in the summer of 1990 by ABB. A total of 327 wells, including USEPA wells, were inventoried. This is part of a selection process to determine which wells will remain part of the Long Term Monitoring Program. ABB's recommendations of which wells should to be decommissioned is currently under DEC review.

### Results of Groundwater Monitoring - Hydrology

Readings were taken on five dates during the year, and flow nets were prepared for six cross-sections using data from the six series of piezometers identified on Figure 3. Figure 4 is a cross-section from inside the barrier drain outward, away from the Canal. It shows the direction of groundwater flow. The vertical scale on the cross-section is exaggerated 5 times over the horizontal scale, to aid in interpretation. Figure 4 was selected as typical of the six cross-sections. Evaluation of the cross-sections leads to the conclusion that the barrier drain is capturing all leachate migrating horizontally outward from the Canal, as well as pulling groundwater, which is outside the barrier drain, back toward the drain.

In the Spring of 1990 a special hydrological study of the bedrock in the southwest area of the site was undertaken by New York State Department of Environmental Conservation staff. The study investigated the hydrology of the bedrock underlying the southwest area of the site, and was performed to evaluate trace levels of contaminants found in monitoring well #10225C and other wells installed during construction of the DCF. The study took place concurrently with redevelopment of the DCF wells and consisted of removing several well volumes of groundwater while simultaneously and continuously measuring water levels in the pumped well and several observation wells. The following conclusions can be drawn from the investigation:

Figure 3

LOVE CANAL  
LONG TERM MONITORING PROGR  
1990 Groundwater Level Survey Location

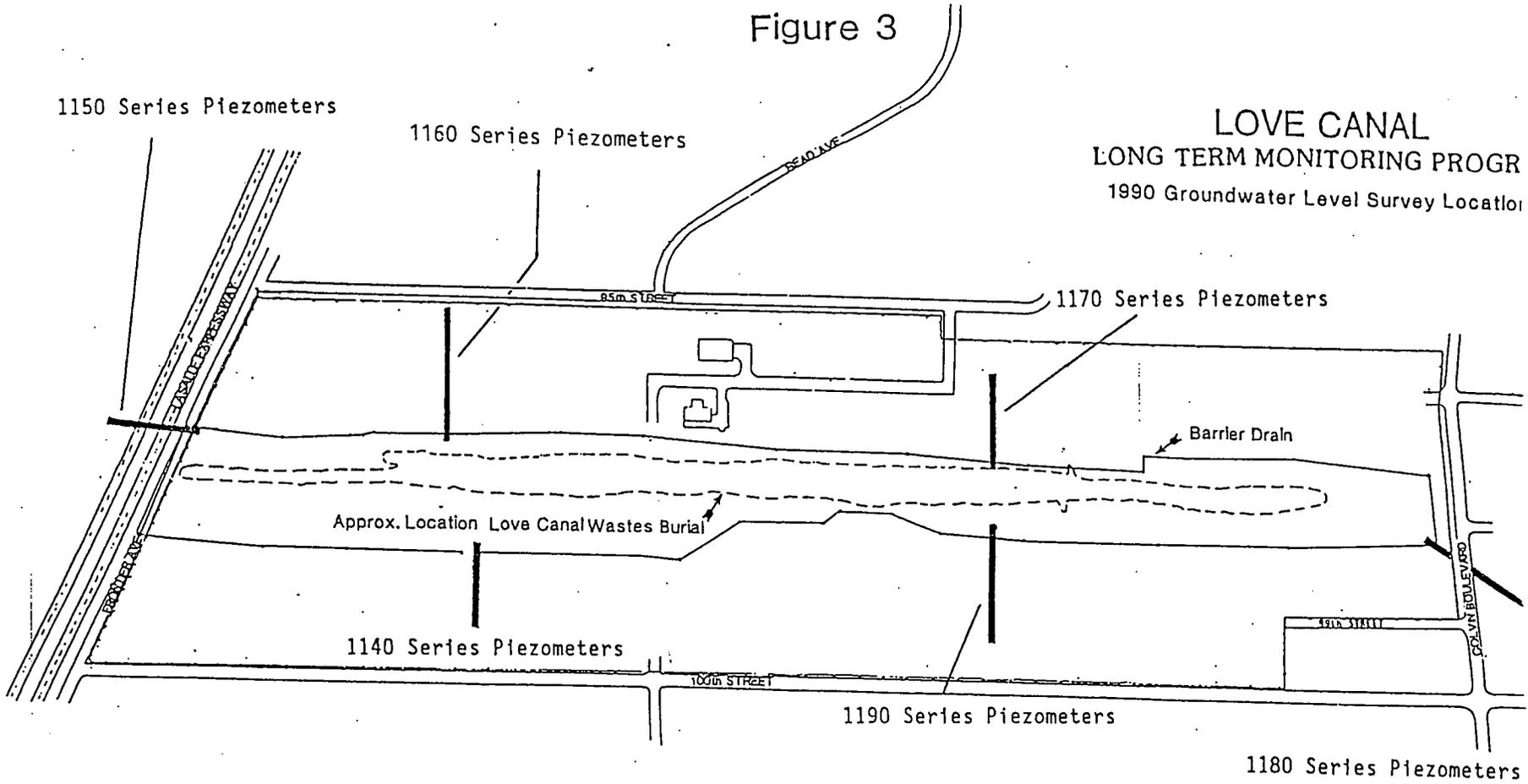
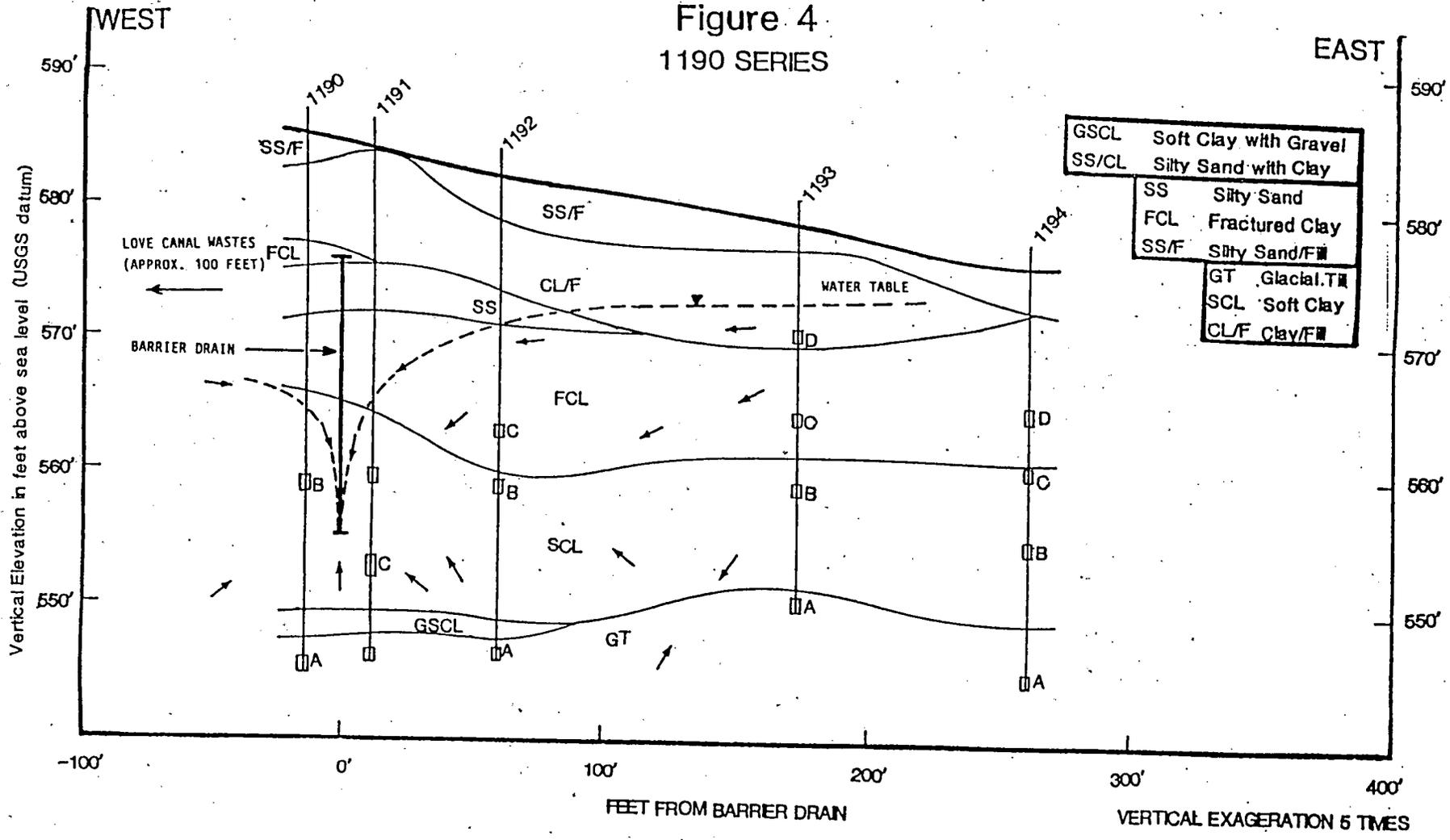


Figure 4  
1190 SERIES



- (1) In the Southwest area of the site, the bedrock aquifer is isolated from the overburden aquifer.
- (2) Within the bedrock aquifer are interconnections which extend over a large area.

Conclusion (1) means that there is very little likelihood for migration of groundwater from the overburden into the bedrock, or vice versa. Conclusion (2) means that a hydrologic effect introduced into the bedrock at one point will be experienced at many other bedrock localities throughout the vicinity. In the unlikely event that a trace amount of contamination reaches the bedrock, it would rapidly be detectable over a large area.

### Results of Groundwater Monitoring - Chemistry

In addition to the piezometers, there is a system of overburden and bedrock wells designed primarily for monitoring the chemical quality of groundwater at the Love Canal site. At the time these wells were installed their locations were chosen to maximize the likelihood of detecting any failure that might occur in the barrier drain system. In 1988-89 construction activities associated with the DCF removed some of these wells, and new wells were installed. The 1989 sampling program included 43 long term monitoring wells and all the new wells installed around the DCF. During 1990, samples were collected from 54 wells, and eleven blanks were submitted for quality control purposes. Figure 5 indicates the location of the 54 wells. The 54 wells consist of 43 long term monitoring wells, 7 wells associated with the DCF, and 4 additional off site wells.

As in previous years, the analytical results are characterized by a predominance of non-detect ("ND") values. In a sampling network which is as extensive as the one at Love Canal, and with the high precision maintained by the analytical laboratories, it is expected that occasionally laboratories will report finding compounds (for various reasons) which are not actually present in the ground.

None of the relatively high levels of volatile compounds (such as methylene chloride, acetone, methyl ethyl ketone, and methyl isobutyl ketone) that appeared in previous years were found in the 1990 sampling results. This change is associated with elimination of the ethanol rinse from the decontamination of sampling equipment. Increased scrubbing with detergent wash and a deionized water rinse were substituted when the volatile compounds were found to be denaturants in the ethanol being used. Denaturants are the chemicals mixed into grain alcohol to make it undrinkable before it is sold for commercial uses.



At one well (#4108) low levels of benzene, toluene and trimethyl benzene were found in 1988. Neither these compounds nor other compounds which might be related to Love Canal were detected at this well in 1989 or 1990. Their presence in 1988 is presumed to be associated with the placement of the gasoline powered generator used during sampling at that time.

As noted in previous reports, Well #10135 is the only well in the Long Term Monitoring network intentionally installed into an area of known contamination. It collects groundwater close to the buried wastes. This well has consistently shown elevated levels of chemical compounds such as chlorobenzenes, chlorophenols, benzoic acid, and hexachlorocyclohexane (BHC). In 1990 23 compounds were identified in samples from this well.

1. These compounds are typical of Love Canal chemistry and are considered to represent contamination which escaped into the environment prior to construction of the barrier drain system.
2. The results from this well are used as a baseline for comparison with findings from the other monitoring wells.
3. If the Canal were to leak, similar compounds at similar levels would begin to be detected in other wells.

Independent hydraulic evidence indicates that Well #10135 is within the hydraulic influence of the barrier drain system, thus groundwater and contaminants are flowing back toward the Canal. The well is approximately 85 feet outside the barrier drain, which is closer to the drain than other long term monitoring wells. (Refer to Figure 5 for its location.)

Well #10225C was installed in 1989 to replace an earlier well (also numbered 10225C) which was eliminated by construction activity. Low levels of contaminants were found in the well during the 1989 Long Term Monitoring program. As a result the well was resampled twice between the 1989 and 1990 sampling events. Prior to the 1990 sampling the NYSDEC requested that a consulting firm which is familiar with the Love Canal site and monitoring well program review the data from Well #10225C and provide an independent assessment. The Department was particularly interested in the question of whether the data suggested any trend in levels of contamination. The firm responded with a letter dated July 30, 1990, which is available for inspection in the Public Information Office. The letter states that:

1. It is early to draw final conclusions concerning the presence of a trend.
2. The data should be used as a basis for comparing future data from these wells to determine whether there is a trend.

The data from the September sampling is consistent with the previous analyses. The low levels of contamination in this well do not indicate the need for action or further study at this time. However, future results from this well will be tracked with special attention to any evidence of a change in groundwater conditions.

The results from the Long Term Monitoring Program will continue to be made public. Should a trend occur for any of the parameters monitored, the situation will be immediately evaluated and appropriate action taken.



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