Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

3M O-Cel-O Sponge Site

Town of Tonawanda, Erie County

Registry Number 915148

March 1999

New York State Department of Environmental Conservation

GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

3M O-CEL-O SPONGE FACILITY
Inactive Hazardous Waste Site
Town of Tonawanda, Erie County, New York
Site No. 915148

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the 3M O-Cel-O Sponge Inactive Hazardous Waste Disposal Site that was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the 3M O-Cel-O Sponge Inactive Hazardous Waste Disposal Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record in included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of carbon disulfide (CS_2) from the site have been addressed by the completed Interim Remedial Measures (IRMs) described in this ROD; therefore, the site no longer represents a current or potential significant threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the IRMs and the Remedial Investigation/Feasibility Study (RI/FS) completed at the 3M O-Cel-O Sponge Site and the criteria identified for evaluation of alternatives, the NYSDEC has selected No Further Action as the remedy for the site. The IRMs undertaken at the site included:

- Installation of a new CS_2 storage tank system to eliminate future releases of CS_2 to the environment;
- Closure of the former CS_2 storage tank;
- Removal of approximately 300 cubic yards of CS_2 contaminated soil from the former drainage swale; and
- Upgrading of the former drainage swale to reduce infiltration and promote more effective storm water management.

To ensure that human health and the environment remain adequately protected, long term groundwater monitoring and maintenance of the IRMs will be required. In addition, 3M has agreed to file a deed restriction with the Erie County Clerk's Office prohibiting the use of the site by it or other corporations or individuals for residential purposes. The Department will also reclassify the site from a Class 3 to a Class 4 in the New York State Registry of Inactive Hazardous Waste Disposal Sites (Registry).

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 30, 1999
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE **PAGE**

APPENDIX **PAGE**

RECORD OF DECISION

3M O-Cel-O Sponge Site
Town of Tonawanda, Erie County, New York
Site No. 915148
March 1999

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The 3M O-Cel-O Sponge Site (Figure 1), consisting of less than 1 acre of this active sponge manufacturing facility, bounds an area where soils underlying a former carbon disulfide (CS_2) storage tank and an associated drainage swale were contaminated by CS_2. This contamination resulted from the historical handling practices of this compound from the early 1960s through late 1995. In the 1990s O-Cel-O implemented several Interim Remedial Measures (IRMs) at the site, including: (1) replacement of the CS_2 storage tank, (2) excavation and disposal of approximately 300 cubic yards of contaminated soils and (3) improvements to surface water drainage in the drainage swale area of the site. To determine whether residual contamination remaining after these actions were implemented could adversely impact human health and/or the environment, and to evaluate possible alternatives to address any continuing threats that may be found, 3M conducted a Remedial Investigation/Feasibility Study (RI/FS) at the site. The RI concluded, that although contamination remains on site, the IRMs have effectively mitigated the significant threat to human health associated with direct exposure to CS_2 contaminated soils. In addition, no significant threats to the environment were identified. The absence of a significant threat supports the current Class 3 designation for this site in the New York State Registry of Inactive Hazardous Waste Disposal Sites (Registry).

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected the remedy for the 3M O-Cel-O Sponge Site. As more fully described in Sections 3 and 4 of this document, historical operations at this manufacturing facility have resulted in disposal of hazardous waste, specifically carbon disulfide, some of which has caused subsurface soil contamination at the site. Prior to the IRMs, these disposal activities resulted in the following significant threat to public health and/or the environment:

- A significant threat to human health associated with direct exposure to CS_2 contaminated surface soil.

During the course of the investigation certain actions, known as Interim Remedial Measures (IRMs), were undertaken at the 3M O-Cel-O Sponge Site in response to the threat identified above. IRMs are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the Remedial Investigation/Feasibility Study (RI/FS). The IRMs undertaken at this site included:

- Installation of a new CS_2 storage tank system to eliminate future releases of CS_2 to the environment (Figure 2);
- Closure of the former CS_2 storage tank (Figure 2);
- Removal of approximately 300 cubic yards of CS_2 contaminated soil from the former drainage swale (Figure 3); and
- Upgrading of the former drainage swale to reduce infiltration and promote more effective storm water management (Figure 2).

Based upon the success of the above IRMs, the RI concluded that the IRMs have adequately addressed the significant threat originally posed by hazardous waste at the site; therefore, No Further Action was selected as the remedy for this site. Long term groundwater monitoring will be required to ensure that human health and the environment remain adequately protected by detecting CS_2 if it migrates to upper bedrock groundwater. Maintenance of the IRMs will also be required to ensure their integrity. In addition, 3M will file a deed restriction with the Erie County Clerk's Office prohibiting the use of the site by it or other corporations or individuals for residential purposes. The Department will also reclassify the site to a Class 4 site in the Registry.

SECTION 2: SITE LOCATION AND DESCRIPTION

The 19 acre O-Cel-O Sponge Facility, owned by the 3M Corporation, is located at 305 Sawyer Avenue in a heavily developed industrial area of the Town of Tonawanda, Erie County, New York. The Facility is bounded by Sawyer Avenue and a mix of industrial and residential properties to the north, the Dunlop Tire Corporation to the south, an industrial property to the east, and an industrial facility to the west (Figure 1). The portion of the facility listed in the Registry, consisting of less than 1 acre, includes the former CS_2 storage tank and former drainage swale behind the Facility (Figure 3). The topography of the site is relatively flat, with most surface water runoff toward an on-site storm sewer system. Historically, surface water collected in the drainage swale and was conveyed through piping underneath the facility (Figure 2) to a drainage ditch along Sawyer Avenue. The Niagara River is located approximately 1 mile west of the facility.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Cellulose sponges have been manufactured at the 3M O-Cel-O facility since 1948 using CS_2, a highly volatile and flammable compound. From 1975 to 1983, O-Cel-O used an off-site settling pond (former Registry Site No. 915042) to separate insoluble sulfides from wastewater generated during cellulose sponge production. Use of this settling pond ceased in 1983, with 2,078 tons of accumulated sludges subsequently excavated and transported off-site for disposal at a NYSDEC permitted landfill. An inspection of the excavation by Department personnel in September 1983 verified that all sludges had been removed. Following Department approval, the excavation was backfilled with clean material. This site was delisted from the Registry in 1987.

The CS_2 contamination associated with the former storage tank and drainage swale resulted from historical handling practices of this compound. From the early 1960s through late 1995, CS_2 was stored in a 19,000 gallon steel tank located on the southeastern portion of the Facility (Figure 2). An earthen berm surrounded the tank prior to the installation of a five foot high concrete containment structure in the early 1970s. Historically, the CS_2 storage tank was loaded directly from railroad tank cars by displacing the CS_2 in the tank car with water. Upon completion of the transfer, water within the tank car was discharged to the diked containment area. Similarly, water that was displaced from the storage tank as it filled was also discharged to the containment area. In the past, a control structure (weir) in the containment area allowed any overflow to discharge into an adjacent drainage swale (Figure 3). Operational modifications were subsequently implemented by the Facility to prevent discharges of water containing CS_2 to the swale. A permitted aeration process was also constructed within the containment dike to reduce the concentration of CS_2 in water within the diked area. This water was then discharged directly to the Tonawanda Publicly Owned Treatment Works (POTW) in accordance with applicable limits in the Facility's permit. The storage tank was decommissioned and the drainage swale was upgraded through the implementation of IRMs. These IRMs are discussed in more detail in Section 4.2.

3.2: Remedial History

Several site investigations have been conducted by O-Cel-O to characterize the extent of CS_2 contamination in the vicinity of the former CS_2 storage tank and drainage swale. Based upon the results of these investigations, O-Cel-O conducted several soil removal activities to address the presence of contaminated soils.

On November 24, 1991 approximately 15 cubic yards of contaminated soils were excavated from the pipe bridge drain between Building 31 and the northern portion of the CS_2 Recovery Facility (Figure 3). Following this removal action, confirmatory soil samples were collected for analysis to evaluate the effectiveness of the removal. These results indicated that the 1 part per million (ppm) soil cleanup goal selected for this removal action had not been achieved and that additional soil removal was required. As a result, an additional 3 cubic yards of contaminated soils were excavated on December 8, 1991. Confirmatory samples were again collected for analysis, and indicated that the 1 ppm soil cleanup goal was achieved. All excavated soil was transported to a NYSDEC permitted hazardous waste landfill for disposal.

Between November 22-25, 1991 approximately 180 cubic yards of contaminated soils were excavated from the drainage swale area (Figure 3) and transported off-site for disposal at a NYSDEC permitted hazardous waste landfill. Following this removal action, twenty-four confirmatory soil samples were collected for analysis to evaluate the effectiveness of the removal action. These results indicated that the 1 ppm soil cleanup goal selected for this removal action had not been achieved and that additional soil removal was necessary. As a result, an additional 112 cubic yards of contaminated soils were excavated from December 5-10, 1991 and transported to a NYSDEC permitted hazardous waste landfill for disposal. Following this second removal action, three more confirmatory soil samples were collected for analysis. Because two of these samples contained CS_2 at significant concentrations (390 and 590 ppm, respectively), remedial activities were halted, and a supplemental investigation was recommended by O-Cel-O's consultant to assess further the extent and magnitude of CS_2 contamination.

As a result, a Supplemental Site Characterization study was implemented by O-Cel-O between March 9 and May 8, 1992 that culminated in the submittal to the Department of a report entitled "Site Assessment and Focused Feasibility Study, October 1992". This information was subsequently incorporated into the RI/FS and is described in more detail in Section 4.1.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination remaining on-site following the 1991 soil removal actions, and to evaluate alternatives to address the potential threat to human health and the environment posed by the presence of hazardous waste, 3M completed a Remedial Investigation/Feasibility Study (RI/FS) at the site.

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of CS_2 contamination resulting from previous activities at the site.

The RI was conducted in two phases. The first phase was conducted between March and May 1992 with the second phase conducted between March 1994 and May 1996. A report entitled "Report on the Site Assessment and Risk Characterization Study, September 1997" has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- The installation of forty-three (43) soil borings (Figure 4) in the former storage tank and drainage swale area to delineate both the vertical and horizontal extent of CS_2 contamination;

- The installation of thirteen (13) soil borings in the pipe bridge drain area to confirm the effectiveness of the 1991 excavation program;

- The collection of soil samples for chemical analysis of CS_2;

- The installation of four (4) deep (approximately 70 feet below ground surface) monitoring wells (Figure 2) to determine the direction of groundwater flow across the site and the extent of groundwater contamination, if any;

- The installation of two (2) lysimeters (Figure 2) to facilitate the collection of pore water from unsaturated soils. These lysimeters were installed directly into the most heavily contaminated soils. (Note: soil pore water is defined as water in the unsaturated zone that is bound to the soil particles. Soil pore water, unlike groundwater, has very low mobility. A lysimeter is a porous ceramic cup placed in the unsaturated zone that draws soil pore water into it. This water is sampled through tubing under a vacuum); and

- The quarterly collection of groundwater samples from the four wells and two lysimeters for chemical analysis.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the 3M O-Cel-O Sponge Site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of the NYS Sanitary Code. For soils, NYSDEC TAGM 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and health-based exposure scenarios.

Based upon the Remedial Investigation results, which were compared to the SCGs, certain areas and media of the site are contaminated above the SCGs. These areas and media are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) or parts per million (ppm). For comparison purposes, where applicable, the SCGs are provided for each medium.

4.1.1: Site Geology and Hydrology

The geology and hydrology of the 3M O-Cel-O Sponge Site have limited the offsite migration of CS_2 and have prevented the regional aquifer from becoming contaminated by the site. The geology and hydrology of the site are briefly described in this section.

At the 3M O-Cel-O Sponge Site four distinct stratigraphic units exist (Figure 5). These units, in order of increasing depth below ground surface, include:

- Fill consisting primarily of gravel and disturbed silty clay. The approximate thickness of this unit ranges from 0 to 5 feet;

- Glaciolacustrine silty clay. This deposit has a very low permeability (meaning that groundwater cannot easily move through it). The approximate thickness of this unit is 62 feet;

- A dense glacial till approximately 6 feet thick that is composed of poorly sorted gravelly sand and clay. The permeability of this unit is also very low; and

- Shale bedrock of the Camillus Shale Formation. This formation was encountered at depths ranging from 69 to 71 feet.

In addition, the glaciolacustrine silty clay consists of two subunits (Figure 5). The upper silty clay unit, which is approximately 30 feet thick, is unsaturated and contains fine vertical desiccation cracks. The lower silty clay is saturated and does not contain vertical cracks. The approximate thickness of this lower unit is 35 feet.

Perched groundwater, which is limited in lateral extent, is sporadically encountered within the fill material. This water is perched (located) on top of the glaciolacustrine silty clay because of its low permeability. Small quantities of perched water, however, can move into the upper silty clay unit through the desiccation cracks. Soil pore water, found in very small quantities, is bound to the soil particles of the upper (unsaturated) silty clay unit. As a result, this water has very low mobility.

The Camillus Shale Formation is part of a regional aquifer in the Erie-Niagara basin. Groundwater from this bedrock aquifer, however, is not utilized as a source of drinking water in the Tonawanda area because of naturally occurring high mineral content and the close proximity of the Niagara River, an important source of municipal drinking water throughout the Western New York area. Groundwater flow in the upper bedrock aquifer is to the west toward the Niagara River.

4.1.2: Nature of Contamination

As described in the RI Report, 39 water and approximately 800 soil samples were collected at the site to characterize the nature and extent of contamination remaining on site following the completion of soil removal activities in 1991. Carbon disulfide (CS_2), a volatile organic compound (VOC), is the main contaminant of concern at this site.

4.1.3: Extent of Contamination

Table 1 summarizes the extent of CS_2 contamination in soil, perched groundwater, soil pore water and upper bedrock groundwater, and compares these data to the SCGs for the site. The following are the media that were investigated and a summary of the findings of the investigation.

Soil

The highest concentrations of CS_2 were detected in unsaturated soils (100 to 1400 ppm) at depths ranging from 6 to 16 feet below grade near the former CS_2 storage tank and drainage swale (Figures 4 and 5). For comparison, the Department's soil cleanup objective for CS_2 is 2.7 ppm. Soils directly beneath the former storage tank contain the highest concentrations of CS_2 (Figure 4). Carbon disulfide was not detected in any samples collected from 0 to 2 feet depth, was only detected in three samples (0.1 to 0.3 ppm) from 2 to 4 feet depth, and was only detected in one sample (6.3 ppm) from 4 to 6 feet depth. While CS_2 contaminated soils have been found to depths of approximately 35 feet below grade at concentrations of 10 ppm or more (Figure 5), CS_2 concentrations decrease rapidly with increasing distance from the former storage tank and eastern swale area (Figure 4), and generally decrease with increasing depth below 16 feet (Figure 5). Soils analytical data show that over a period of about 30 years CS_2 has not migrated very far laterally. In addition, the saturated lower silty clay unit has prevented the further downward migration of CS_2 and kept upper bedrock groundwater from becoming contaminated.

Perched Groundwater

Analytical results of perched groundwater collected from eight borings in the drainage swale area are summarized in Tables 1 and 2. The concentrations of CS_2 in these samples ranged from non-detect to 940,000 ppb. For comparison, the Department's groundwater standard for CS_2 is 50 ppb. The highest concentration of CS_2 (940,000 ppb) was detected in water from a boring (SB-7) angled beneath the former storage tank containment structure (Figure 4). CS_2 in perched groundwater from boring SB-9 south of the former tank (Figure 4) was detected at a concentration of 90,000 ppb, while at boring SB-19 farther west (Figure 4) the concentration of CS_2 was 8,700 ppb. The remaining samples contained CS_2 at concentrations below 800 ppb, with three of these samples containing no CS_2. Like site soils, CS_2 concentrations in perched groundwater decrease with increasing distance from the former storage tank and eastern swale area. As discussed in Section 4.1.1, this water is limited in lateral extent and only sporadically encountered at the site.

Soil Pore Water

Analytical results of soil pore water samples collected from the two lysimeters are summarized in Tables 1 and 3. The concentrations of CS_2 in these samples ranged from 40 to 390,000 ppb, with the results from lysimeter LY-2 consistently higher than those from lysimeter LY-1. For comparison, the Department's groundwater standard for CS_2 is 50 ppb. As discussed in Section 4.1.1, this water is bound to the soil particles and has very low mobility.

Upper Bedrock Groundwater

Analytical results of upper bedrock groundwater samples collected from the four on-site monitoring wells are summarized in Tables 1 and 4. CS_2 was only detected in the samples collected shortly after well installation, which may be related to contaminated soil being carried down the borehole during installation. Subsequent quarterly sampling of these wells in 1995 and 1996 detected no CS_2. These data confirm that the saturated lower silty clay unit has prevented the further downward migration of CS_2 and kept upper bedrock groundwater from becoming contaminated.

Summary

The presence of contaminated soils above the Soil Cleanup Goal for CS_2 indicates that there is a potential for groundwater underlying the site to be adversely impacted by these soils. Contamination of soil pore water supports this. As discussed above, however, soil pore water is bound to the soil particles of the unsaturated upper silty clay unit, making it nearly immobile. As a result, the potential impact of this water on human health and the environment is remote.

Perched groundwater is also contaminated with CS_2. In the vicinity of the former storage tank this water is highly contaminated, but CS_2 concentrations decrease with increasing distance from the tank. This water is highly localized, limited in lateral extent, and largely immobile. As a result, exposure to this water and its potential to impact the environment is also remote.

While CS_2 has migrated vertically through approximately 35 feet of the unsaturated silty clay unit, the presence of the saturated upper silty clay unit has prevented the migration of CS_2 to upper bedrock groundwater. Given the geology and hydrology of the site, combined with the IRMs completed by 3M (discussed in detail below), future impacts to upper bedrock groundwater from CS_2 are not expected.

4.2: Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure

pathway can be effectively addressed before completion of the RI/FS.

3M implemented various IRMs at the site from 1994 through 1996 to mitigate potential adverse impacts to the environment and public health from CS_2 contaminated soils and from the transfer of CS_2 to the storage tank during unloading operations. A detailed description of these IRMs can be found in the document entitled, "Closure Report for Interim Remedial Measures, September 1997." Specific elements of the IRM included:

4.2.1: Installation of New CS_2 Storage Tank System

3M constructed a new state of the art CS_2 storage facility designed to prevent future releases of CS_2 to the environment. The location of this storage facility is approximately 150 feet southwest of the former CS_2 storage tank (Figure 2). The system became operational in late winter of 1995, and is registered with the Department through the Chemical Bulk Storage program.

4.2.2: Closure of Former CS_2 Storage Tank

The former CS_2 storage tank underwent a systematic close-out once the new storage tank was on-line and fully tested. During close-out, the former tank was emptied of remaining CS_2, purged with steam to remove residual product, emptied of sludge at the bottom of the tank, and dismantled. All water in the tank was discharged to the containment dike and subsequently discharged to the Tonawanda Publicly Owned Treatment Works (POTW) for treatment. All metal debris was sent off-site as scrap. The concrete containment dike was backfilled with clean on-site soils, and graded to promote runoff.

4.2.3: Removal of Contaminated Soil

It was initially estimated that approximately 400 cubic yards of CS_2 contaminated soil would be excavated as part of the IRM activities. Based upon a review of supplemental information provided by 3M, combined with the soil removal activities completed in 1991, modification of the IRM Work Plan to eliminate soil removal activities was approved by the Department in November 1994. Specifically, this determination was based upon the following:

- Approximately 300 cubic yards of contaminated soil was excavated and disposed off-site in 1991. Excavation in some areas extended to a depth of approximately 8 feet;

- Soil boring data collected in 1992 and 1994 indicated the following: (1) CS_2 was not detected in soils 0 to 2 feet below grade, satisfying the goal of the NYSDOH to reduce potential exposures at the ground surface; (2) for soils 2 to 4 feet below grade, CS_2 was not detected at concentrations above the current soil clean-up goal of 2.7 ppm; and (3) for soils 4 to 6 feet below grade, CS_2 was only detected above the soil clean-up goal in one sample (6.3 ppm); and

- Although excavation deeper than 6 feet could be completed, the depth of the excavation would be limited by structural stability constraints due to the close proximity of railroad sidings and the new CS_2 storage facility. Because of this, a large quantity of contaminated soils too deep to excavate would remain on site. Given these limitations and constraints, the Department determined that additional soil excavation was not required under the IRM Order on Consent.

It is important to note that none of the other actions outlined in the approved IRM Work Plan were modified or eliminated by the Department's determination regarding soil removal activities.

4.2.4: Drainage Swale Upgrade

The former drainage swale was upgraded to promote more effective stormwater management by minimizing infiltration into subsurface soils. This reduction in infiltration will reduce the potential impact on groundwater by CS_2 contaminated soils. The upgrades were completed in the spring of 1995, and included the installation of catch basins and corrugated metal pipe. The swale was backfilled with clean soils excavated during construction of the new CS_2 storage tank system, and graded to direct stormwater off-site or to the catch basins.

4.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 7 of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are: (1) the source of contamination; (2) the environmental media and transport mechanisms; (3) the point of exposure; (4) the route of exposure; and (5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- ingestion of contaminated soil, perched groundwater and/or soil pore water;
- inhalation of particulates generated from contaminated soil, and CS_2 vapor emissions from contaminated soil, perched groundwater and/or soil pore water; and
- dermal contact with contaminated soil, perched groundwater and/or soil pore water.

The 3M O-Cel-O Sponge property is currently utilized for industrial purposes and is likely to remain industrial in the future. On-site workers, therefore, have the greatest potential for exposure, while exposure to the general public is remote. As a result, two worker scenarios were evaluated in the Risk Assessment: a current maintenance worker, and a future construction worker.

Because CS_2 was not detected in soils 0 to 2 feet below grade, direct contact by the maintenance worker with contaminated soil is unlikely. As a result, exposure of the current maintenance worker is restricted to inhalation of CS_2 vapor emissions from subsurface soil. As maintenance activities in the former storage tank and drainage swale area are limited, the potential for exposure is also limited.

The future construction worker scenario was evaluated because it is possible that excavation of contaminated soil deeper than 6 feet could occur sometime in the future. The construction worker could be exposed to CS_2 directly through the incidental ingestion of, and/or direct contact with, contaminated soil, perched groundwater and soil pore water; indirect exposure could occur through the inhalation of particulates generated from contaminated soil, and CS_2 vapor emissions from contaminated soil, perched groundwater and/or soil pore water. The duration of such exposures, however, would be limited to the length of the construction project.

Upper bedrock groundwater at the site does not represent an exposure pathway because it is not contaminated nor is it used as a source of potable water. This groundwater is not expected to become a potable water source in the future as public water is readily available.

4.4 Summary of Environmental Exposure Pathways:

The completion of an environmental risk assessment to evaluate ecological receptors was not required because the site is located in a highly developed industrial complex that does not provide sufficient habitat for ecological receptors. While wetlands are located east and southeast of the site, and the Niagara River is located approximately 1 mile to the west, there are no completed pathways by which CS_2 could impact these off-site habitats.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and the 3M Corporation entered into a legal agreement (Order on Consent) on March 26, 1994. The Order obligates 3M to implement a Remedial Investigation/Feasibility Study at the site, and also to complete Interim Remedial Measures. Upon issuance of the Record of Decision the NYSDEC will approach the PRP to implement the selected remedy under an Order on Consent.

The following is the chronological enforcement history of this site:

Date of Order	Index Number	Subject of Order
3/26/94	B9-0369-91-04	RI/FS/IRM

SECTION 6: SUMMARY OF THE REMEDIAL GOALS AND SELECTED ACTION

The selected remedy for any site should, at a minimum, eliminate or mitigate all significant threats to public health or the environment presented by the hazardous waste present at the site. The State believes that the Interim Remedial Measures now in place, which are described in Section 4.2 Interim Remedial Measures, have accomplished this objective provided that they continue to be operated and maintained in a manner consistent with their design.

Based upon the results of the investigations and the IRMs that have been performed at the site, the NYSDEC has selected No Further Action as the remedial alternative for the site. Although some CS_2 contaminated subsurface soils will remain on-site under the selected remedy, the Department believes that the following factors support the No Further Action alternative:

- Significant threats to public health and/or the environment have been eliminated by the IRMs. Future significant threats are not expected as the IRMs have eliminated the primary source (former storage tank) of CS_2 contamination;
- The IRM soil removal activities have achieved TAGM 4046 cleanup goals for site soils to depths of 6 feet;
- Subsurface soils at the site demonstrate very low permeabilities;
- Vertical migration of CS_2 has occurred through desiccation cracks in the unsaturated upper silty clay unit. The presence of the saturated lower silty clay unit, however, has prevented the further downward migration of CS_2 and kept upper bedrock groundwater from becoming contaminated.

Horizontal migration of CS_2 is limited by low soil permeability;

- Upper bedrock groundwater flowing under the site is not impacted by the CS_2 soils lying above;

- Additional soil removal through excavation below 6 feet is limited by structural concerns for buildings at this active manufacturing facility. Further soil removal will not measurably enhance the level of protection to public health and the environment presently existing through completed IRMs and natural conditions;

- Extensive soil excavations at the site would raise public health and safety issues due to the anticipated uncontrolled releases of CS_2 to the atmosphere; and

- Soil vapor extraction or other similar remedial measures are generally ineffective in low permeability soils. While enhancements through soil fracturing techniques could provide limited improvements, such fractures could also threaten the integrity of surface structures that would raise significant safety issues due to the high volatility of and flammability of CS_2.

However, to ensure that human health and the environment remain adequately protected, long term groundwater monitoring and maintenance of the IRMs will also be required. Such monitoring, to be conducted under the supervision of the Department, is feasible and will be effective in detecting future migration of CS_2 should it occur. Maintenance of the IRMs will be required to ensure their integrity. In addition, 3M has agreed to file a deed restriction with the Erie County Clerk's Office prohibiting the use of the site by it or other corporations or individuals for residential purposes. The Department will also reclassify the site from a Class 3 to a Class 4 in the New York State Registry of Inactive Hazardous Waste Disposal Sites. A Class 4 site is one that is properly closed but requires continued management.

SECTION 7: COMMUNITY ACCEPTANCE

Concerns of the community regarding the Interim Remedial Measures and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's responses to the concerns raised. No significant public comments were received that changed the decision for No Further Action at the 3M O-Cel-O Sponge Site.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the 3M O-Cel-O Sponge Site and the status of the Remedial Investigation and Interim Remedial Measures being conducted there. The following public participation activities were conducted for the site:

- A document repository was established at the Parkside Village Library located in the Town of Tonawanda. The documents cited in this ROD are available for review.

- A site mailing list was established that included nearby property owners, local political officials, local media and other interested parties.

- A CP Plan, dated May 1994, describes CP activities to be completed for the site during the remedial process.

- A Fact Sheet describing the RI/FS and IRMs to be undertaken at the site was distributed to the mailing list in October 1994.

- A toll free number was available for specific questions regarding the NYSDEC's Hazardous Waste Remediation Program. The telephone number is (800) 342-9296.

- A Fact Sheet providing a status update on the RI and IRM activities was distributed to the mailing list in October 1995.

- The 3M O-Cel-O Sponge Site was included in four (1996-1999) Tonawanda Sites Summary Reports prepared for the Town of Tonawanda Environmental Commission. The status of this site was discussed each year with members of the commission.

- A Fact Sheet providing a status update on the RI and IRM activities was distributed to the mailing list in January 1998.

- A Fact Sheet describing the IRMs and PRAP was distributed to the mailing list in February 1999.

- A public meeting was held on March 2, 1999 to present the results of the RI/FS, the IRMs and the No Further Action PRAP.

- In March 1999 a Responsiveness Summary was prepared and made available to the public. This Responsiveness Summary addresses the comments received during the public comment period for the PRAP.

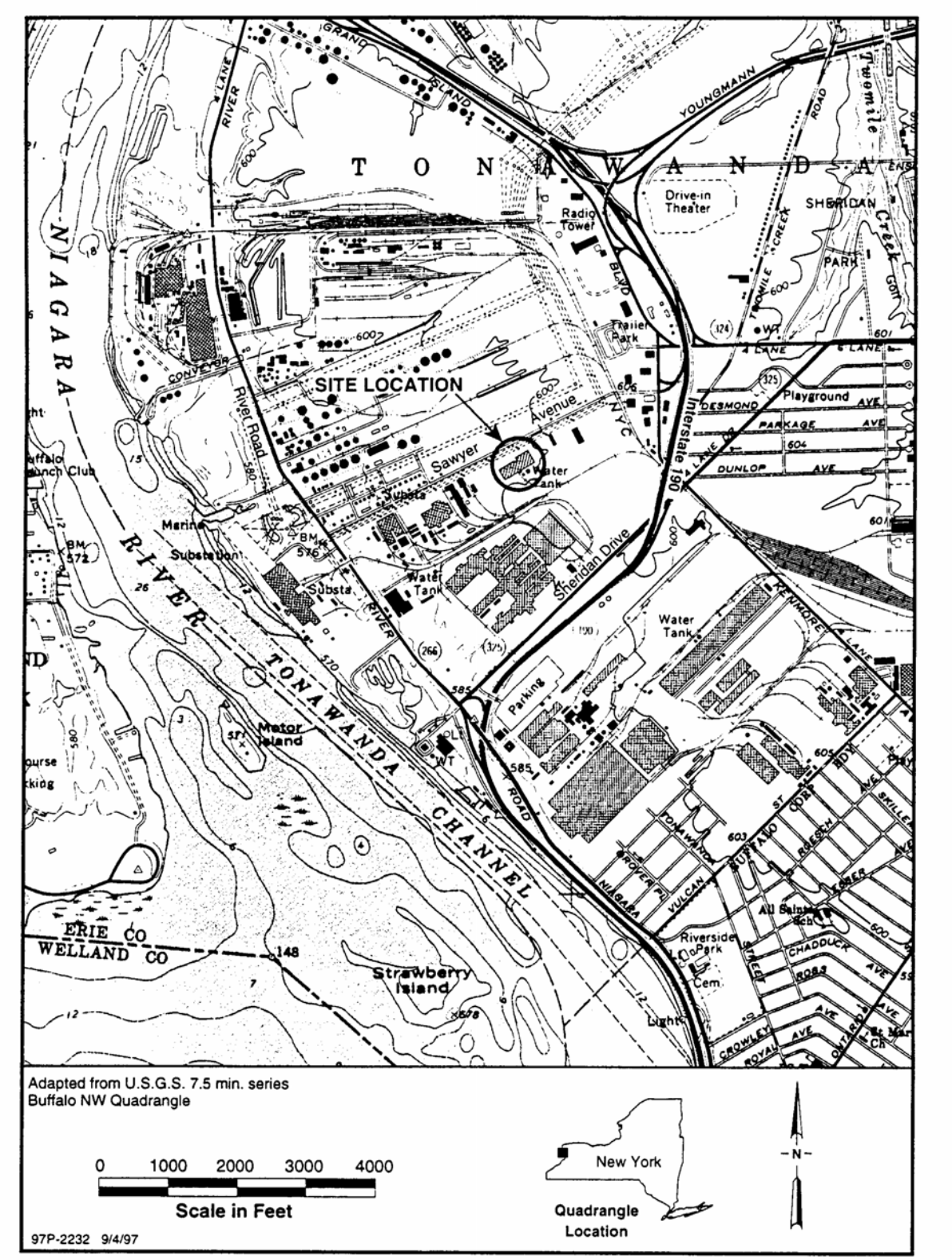

Figure 1 - Location Map of the 3M O-Cel-O Sponge Facility in the Town of Tonawanda, Erie County, New York.

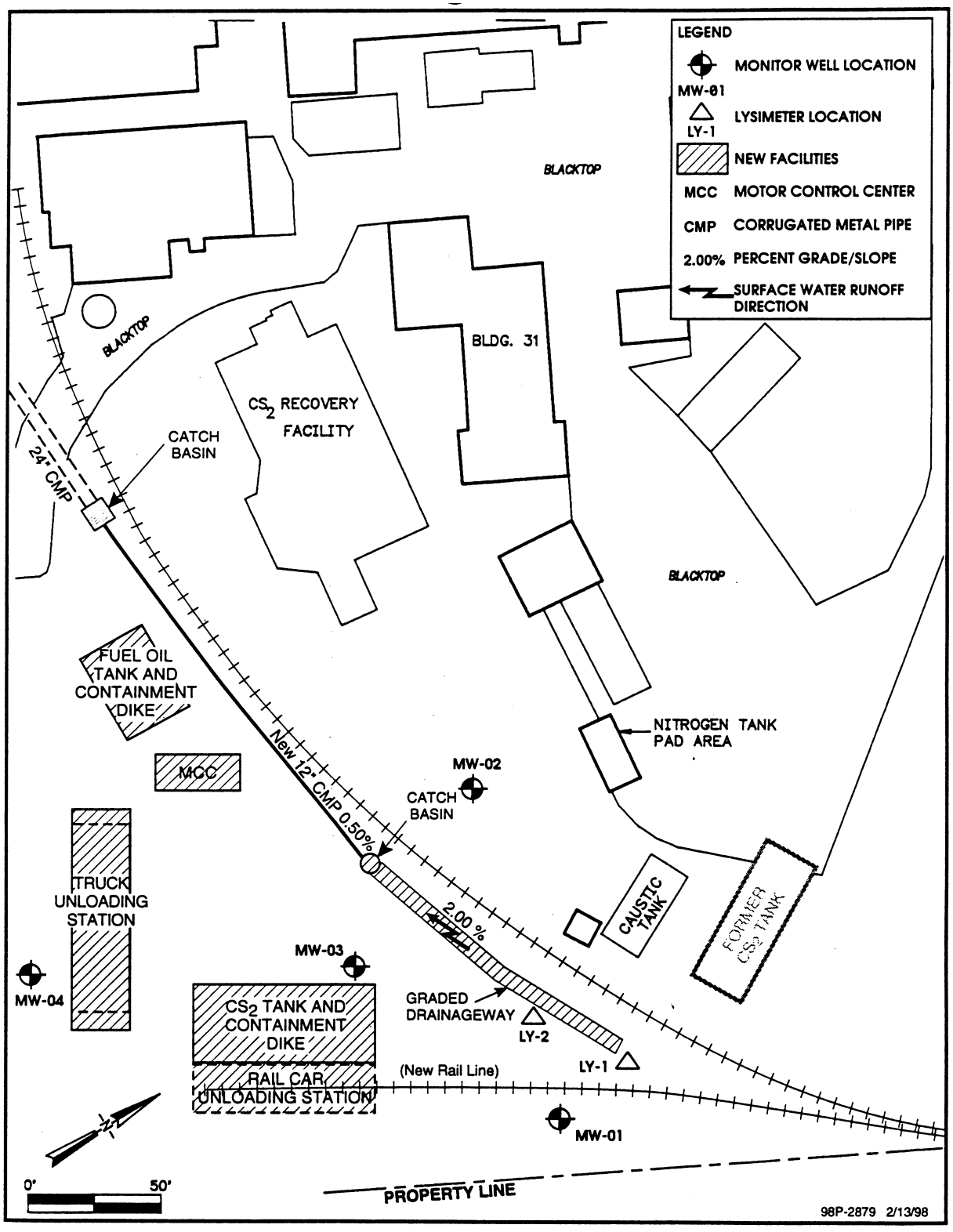

Figure 2 - Site Map Showing the Locations of the Former CS_2 Storage Tank, the Upgraded Drainage Swale, the New CS_2 Bulk Storage Facility, the Monitoring Wells and Lysimeters. The Former Settling Pond (Located off the Map) was Directly East of the Former CS_2 Storage Tank.

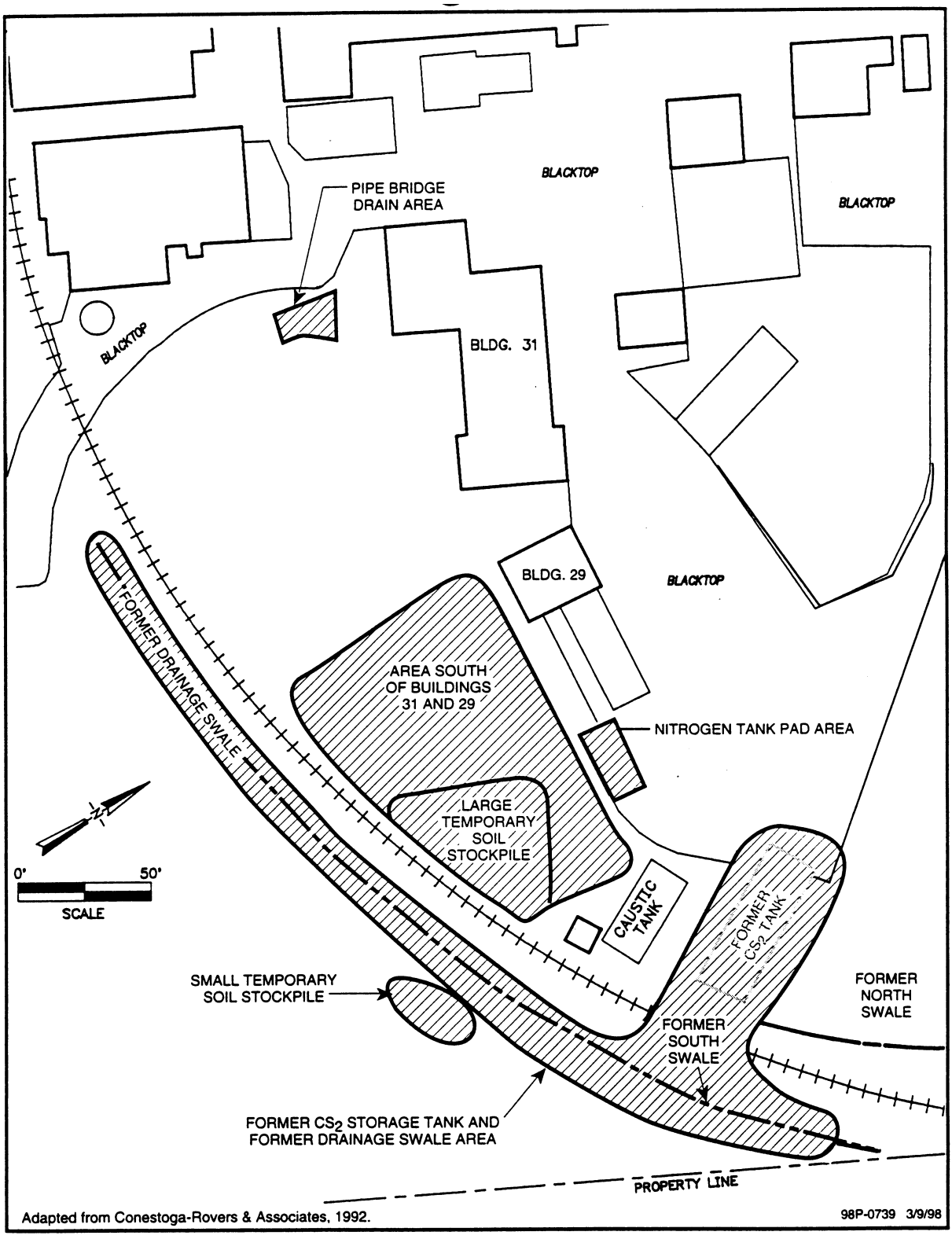

Figure 3 - Site Map Showing the Locations of the Pipe Bridge Drain and Former Drainage Swale Where Soil Removal Activities Were Completed in 1991. The Stockpiled Soils Originated from Construction Activities Associated with the CS_2 Recovery Facility (Figure 2).

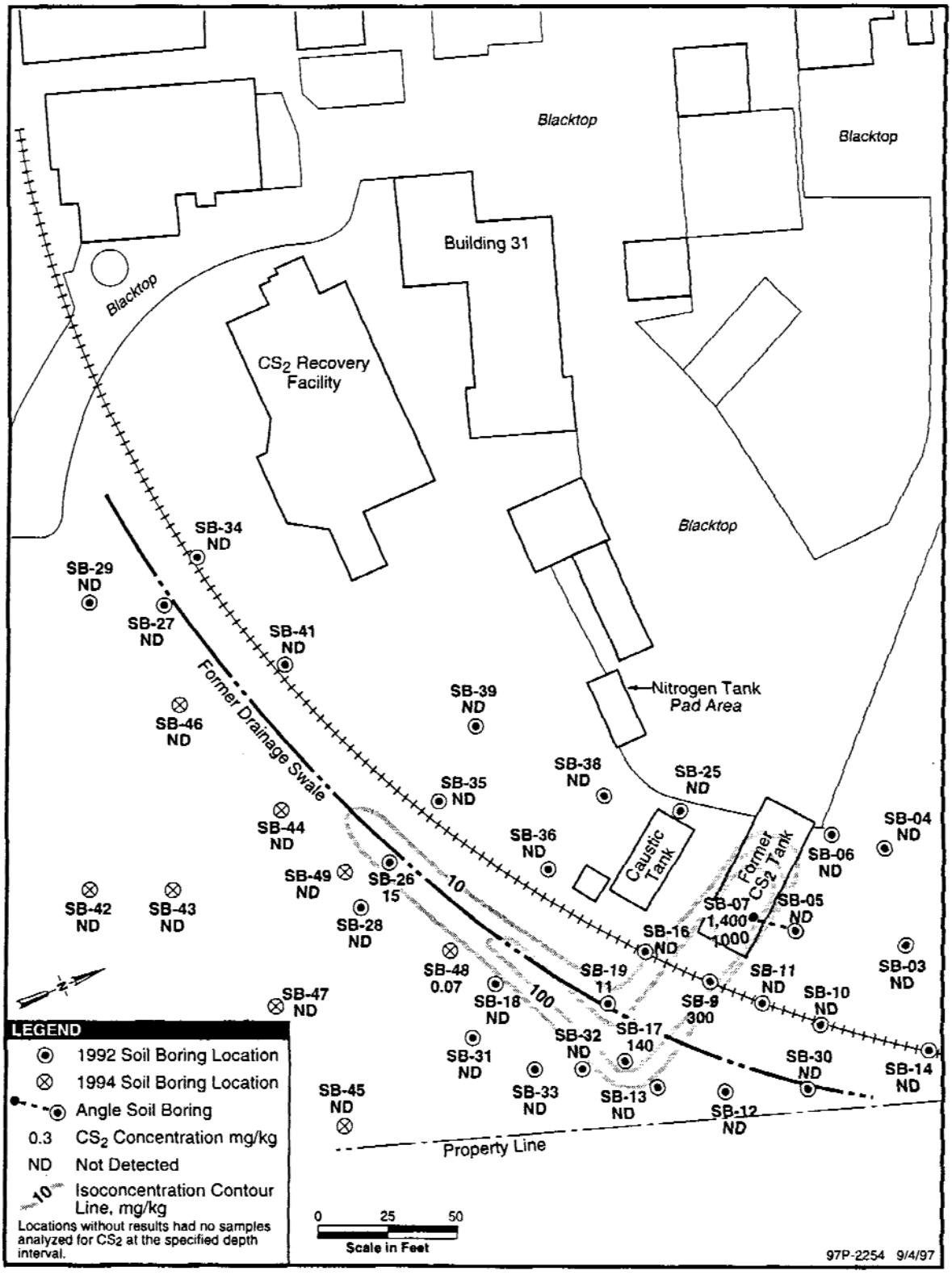

Figure 4 - Site Map Showing the Soil Boring Locations and the Concentration of CS_2 in Soils at 6 to 8 Feet Depth.

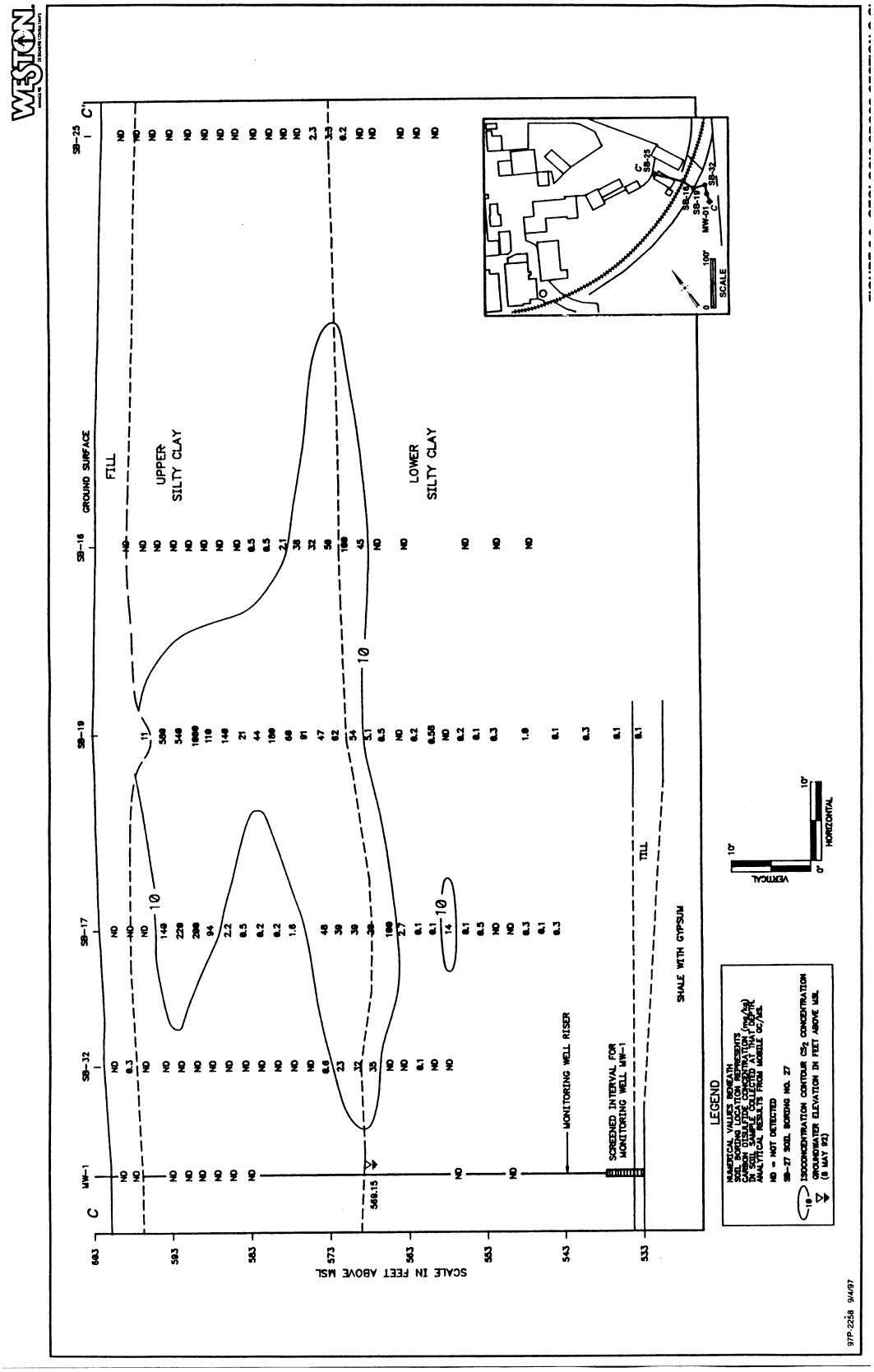

Figure 5 - Geologic Cross-Section Showing CS_2 Concentrations with Depth.

Table 1.
Nature and Extent of CS_2 Contamination at the 3M O-Cel-O Sponge Site.

Media	CS_2 Concentration Range (ppb)	Number of Samples Exceeding SCGs	SCG (ppb)
Surface Soils (0' to 2')	ND (All Samples)	0 of 29	ND
Subsurface Soils	ND to 1,400,000	130 of 797	2700
Perched Groundwater	ND to 940,000	5 of 8	50
Soil Pore Water	40 to 390,000	7 of 8	50
Groundwater	ND to 38	0 of 23	50

Table 2.
Summary of CS_2 Analytical Results for Perched Groundwater in ppb.

Borehole Number	Concentration
SB-4	ND
SB-7	**940,000**
SB-9	**90,000**
SB-11	**70**
SB-19	**8,700**
SB-25	ND
SB-26	**800**
SB-45	ND

ppb Parts per billion
ND Not detected
Shaded values exceed Cleanup Goals

Table 3.
Summary of CS_2 Analytical Results for Soil Pore Water in ppb.

Date of Sample Collection	Lysimeter Number	
	LY-1	LY-2
August 1995	**160**	**91,000**
November 1995	**1,500**	**390,000**
February 1996	**82**	**320,000**
May 1996	40	**350,000**

ppb Parts per billion
Shaded values exceed Cleanup Goals

Table 4.
Summary of CS_2 Analytical Results for Upper Bedrock Groundwater in ppb.

Date of Sample Collection	Well Number			
	MW-1	MW-2	MW-3	MW-4
April 1992	1 J	ND	6	NS
May 1992	25	17	38	NS
July 1995	NS	NS	NS	ND
August 1995	ND	ND	ND	ND
November 1995	ND	ND	ND	ND
February 1996	ND	ND	ND	ND
May 1996	ND	ND	ND	ND

ppb Parts per billion **ND Not detected**
NS No sample collected **J Estimated value**

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

3M O-Cel-O Sponge Site
Town of Tonawanda, Erie County, New York
Site No. 915148

The Proposed Remedial Action Plan (PRAP) for the 3M O-Cel-O Sponge Site was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and issued to the document repositories on February 22, 1999. This Plan outlined the preferred remedial measure for the site and provided opportunities for public input prior to the selection of the final remedy. Based upon the results of the Interim Remedial Measures (IRMs) completed at the 3M O-Cel-O Sponge Site and the criteria identified for evaluation of alternatives, the NYSDEC has selected No Further Action as the remedy for the site.

The release of the PRAP was announced via a notice to the mailing list informing the public of the PRAP's availability for review.

A public meeting was held on March 2, 1999 to present the results of the RI/FS, the IRMs and the No Further Action PRAP. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have been incorporated into the Administrative Record for this site. The public comment period for the PRAP ended on March 23, 1999.

This Responsiveness Summary responds to all questions and comments raised at the March 2, 1999 public meeting; no written comments were received during the public comment period. The following are the comments received during the public comment period, along with NYSDEC's responses:

Question 1: People would like to know how far contamination got into the neighborhood. Were any investigations conducted beyond the 3M O-Cel-O property line?

Answer 1: During the Remedial Investigation (RI), soil borings were initially completed in the areas of known contamination (i.e., the former storage tank and drainage swale) and progressed outward until no carbon disulfide (CS_2) was detected. This investigative approach revealed that carbon disulfide (CS_2) has not migrated to adjacent properties. As a result, investigations were not conducted beyond the 3M O-Cel-O property line.

Question 2: If a soil sample did not contain CS_2, you did not go further out with additional borings. Why?

Answer 2: The investigative approach described above was selected based upon the known history and geology of the site. The historical handling practices of CS_2, specifically the method of transfer and the former presence of a weir in the secondary containment structure, resulted in the release of CS_2 contaminated water from the containment structure to the former drainage swale. The highest concentrations of CS_2, therefore, would be expected near the former storage tank and along the former drainage swale. The presence of a glaciolacustrine silty clay deposit beneath the site was expected to limit the lateral migration of CS_2 due to the silty clay's low permeability, suggesting that CS_2 concentrations would decrease with increasing distance from the former tank and swale. This situation was in fact verified during the course of the RI. As a result, if a soil sample did not contain CS_2,

additional borings further out were not completed because we knew that contamination would not be present in those areas.

Question 3: For how many years was the contaminated water discharged from the secondary containment structure?

Answer 3: The O-Cel-O Sponge facility has been manufacturing sponges at this plant since 1948. While CS_2 was always utilized in the sponge making process, specific details concerning the former storage tank and the handling practices of CS_2 are unknown before 1960. At that time an earthen berm surrounded the former storage tank. In the early 1970s this berm was replaced by a five-foot high containment structure containing a weir. This weir allowed any overflow of contaminated water to discharge to the drainage swale. It is not known with certainty when this weir was eliminated, however, it was not present in 1990 when the Department became involved in the site. Given these uncertainties, CS_2 contaminated water could have been discharged from at least 1948 to 1990.

Question 4: You talked briefly about soil borings before. How many soil borings were completed during the RI?

Answer 4: Forty-three (43) soil borings were completed during the RI with approximately 800 soil samples analyzed for CS_2.

Question 5: How thick is the glaciolacustrine silty clay that you mentioned?

Answer 5: The glaciolacustrine silty clay underlying the 3M O-Cel-O Sponge Site is approximately 65 feet thick. This deposit, however, consists of two subunits: an upper silty clay unit and a lower silty clay unit. The upper silty clay unit, which is approximately 30 feet thick, is unsaturated and contains fine vertical desiccation cracks. The lower silty clay unit, which is approximately 35 feet thick, is saturated and does not contain desiccation cracks.

Question 6: Was CS_2 detected in upper bedrock groundwater? How deep is the bedrock?

Answer 6: Bedrock underlying the 3M O-Cel-O Sponge Site was encountered during the RI at depths ranging from 69 to 71 feet below ground surface. CS_2 was not detected in upper bedrock groundwater because the saturated lower silty clay unit prevents the further downward migration of CS_2, thereby protecting this groundwater.

Question 7: What are the health hazards of CS_2? Was it known in the 1960s that CS_2 was hazardous?

Answer 7: CS_2 is an extremely flammable and volatile compound that can cause headaches, dizziness, drowsiness, nausea, loss of coordination and palpitations during short-term exposures. Long-term exposures can cause nerve damage, speech impairment, and damage to the liver, kidney and heart. The general public, however, has not been exposed to the on-site CS_2 contamination that could result in any of these health related affects.

Health and environmental data concerning many compounds, including CS_2, were not widely available in the 1960s. Following the discovery of the Love Canal waste site in the 1970s, a series of Federal and State regulations were implemented to address historical waste disposal practices of hazardous wastes. The health and environmental hazards of many compounds became widely studied and evaluated after these regulations were implemented.

Question 8: Is CS_2 still being used at the facility?

Answer 8: CS_2 is an integral component of the sponge manufacturing process and is still being used at the 3M O-Cel-O Sponge facility. The new state of the art CS_2 storage facility, however, was designed to prevent future releases of CS_2 to the environment.

Question 9: Why is the volatilization of CS_2 so critical to the choice of remedial options?

Answer 9: Because CS_2 is extremely volatile, it would readily move from the contaminated soil to the atmosphere if these soils were disturbed. As a result, if intrusive activities were completed (e.g., soil excavation; installation of a soil vapor extraction system) measures would have to be implemented to protect construction workers, site employees and nearby residents from the uncontrolled releases of CS_2 that could create an explosion hazard due to the high flammability of CS_2.

Question 10: What was the cost to the State for this work?

Answer 10: All investigative and remedial activities were completed, and paid for, by the 3M Corporation. The only costs incurred by the State are those associated with field oversight, and work plan and report review. These costs are minimal compared to the costs incurred by 3M.

APPENDIX B

Administrative Record

ADMINISTRATIVE RECORD

3M O-Cel-O Sponge Site
Town of Tonawanda, Erie County, New York
Site No. 915148

The following documents constitute the Administrative Record for the 3M O-Cel-O Sponge Site:

Responsiveness Summary for Interim Remedial Measures and the Proposed Remedial Action Plan (Appendix A of ROD), March 1999.

Proposed Remedial Action Plan, 3M O-Cel-O Sponge Site, NYSDEC, February 1999.

Fact Sheet describing the IRMs and the PRAP, 3M O-Cel-O Sponge Site, NYSDEC, February 1999.

Focused Feasibility Study, 3M O-Cel-O Sponge Site, Weston, November 1998.

Closure Report for Interim Remedial Measures, 3M O-Cel-O Sponge Site, Weston, March 1998.

Site Assessment and Risk Characterization Report (RI), 3M O-Cel-O Sponge Site, Weston, March 1998.

Fact Sheet providing a status update on the RI and IRMs, 3M O-Cel-O Sponge Site, NYSDEC, January 1998.

Fact Sheet providing a status update on the RI and IRMs, 3M O-Cel-O Sponge Site, NYSDEC, October 1995.

Fact Sheet describing the RI/FS and IRMs, 3M O-Cel-O Sponge Site, NYSDEC, October 1994.

Citizen Participation Plan, 3M O-Cel-O Sponge Site, NYSDEC, May 1994.

RI/FS/IRM Order on Consent No. B9-0369-91-04, 3M O-Cel-O Sponge Site, NYSDEC, March 26, 1994.

Executive Summary for Site Investigation, 3M O-Cel-O Sponge Site, Radian, August 13, 1990.

Assessment of Carbon Disulfide Cleanup Levels, 3M O-Cel-O Sponge Site, Acres International, September 21, 1989.

Supplemental Study on the Carbon Disulfide Tank Investigation, 3M O-Cel-O Sponge Site, Acres International, April 1989.

Final Report on the Carbon Disulfide Tank Investigation, 3M O-Cel-O Sponge Site, Acres International, January 1989.