Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Former 3M/Dynacolor Site
Operable Unit No. 1
Brockport, Monroe County, New York
Site Number 8-28-066

March 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Former 3M/Dynacolor Inactive Hazardous Waste Disposal Site
Operable Unit No. 1
Brockport, Monroe County, New York
Site No. 8-28-066

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for Operable Unit #1 of the former 3M/Dynacolor site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for Operable Unit #1 of the former 3M/Dynacolor inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the former 3M/Dynacolor site and the criteria identified for evaluation of alternatives, the NYSDEC has selected enhanced reductive dechlorination. The components of the remedy are as follows:

- Carbohydrate injection to address VOCs in groundwater.
- Monitoring of cyanide degradation in groundwater.
- Institutional controls that will restrict the site's use to industrial/commercial to prevent residential/recreational exposure to residual contamination.
- Institutional controls to limit the use of groundwater to minimize the potential for exposure to contaminated groundwater.
- A site management plan (SMP) that addresses excavation and soil handling in a way that minimizes exposure to contaminants present in the soil.
- To address contamination beneath the building and the potential for VOC intrusion, the (SMP) will require evaluation in the event the building's use changes substantially or the area beneath the building becomes accessible.
- An annual certification by the property owner that the institutional controls are in place and continue to be effective.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is 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.

_____ _____

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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RECORD OF DECISION

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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Former 3M/Dynacolor Operable Unit No. 1. Operable Unit No. 1 refers to the site located at 180 State Street and includes the former residential properties on the east side of Oxford Street and the Boy Scout Cabin Property. The presence of hazardous waste created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, discharges of waste to a leach field and other releases of waste from 3M/Dynacolor's film processing and supporting processes resulted in the disposal of hazardous wastes, including cyanide, metals, volatile organic compounds (VOCs).: Hazardous waste containing the above constituents and polychlorinated biphenyls (PCBs) was found in on-site sewer manholes.

The wastes contaminated the soil and groundwater at the site, and resulted in

- a significant threat to human health associated with potential exposure to soil or groundwater.

- a significant environmental threat associated with the impacts of contaminants to soil and groundwater.

The NYSDEC has approved and overseen the implementation of several interim remedial measures (IRMs) at the site including soil excavations, building demolitions and removal of several manholes and associated soils.

To eliminate or mitigate the remaining threats, the NYSDEC has selected the following remedy:

- Carbohydrate injection to address VOCs in groundwater.
- Monitoring of cyanide degradation in groundwater.
- Institutional controls that will restrict the site's use to industrial/commercial to prevent residential/recreational exposure to residual contamination.
- Institutional controls to limit the use of groundwater to minimize the potential for exposure to contaminated groundwater.
- A site management plan (SMP) that addresses excavation and soil handling in a way that minimizes exposure to contaminants present in the soil.
- To address contamination beneath the building and the potential for VOC intrusion, the (SMP) will require evaluation in the event the building's use changes substantially or the area beneath the building becomes accessible.
- An annual certification by the property owner that the institutional controls are in place and continue to be effective.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The former 3M/Dynacolor Brockport facility is located in a suburban setting in the Village of Brockport, Monroe County, New York. A Site location map is presented on figure 1. The Site is approximately 5.5 acres in size. It is bordered on the west by Oxford Street, on the north by State Street, on the east by the 200 State Street Site (formerly Kleenbrite, General Electric [GE]/Black and Decker), and on the south by the eastward continuation of the Spring Street centerline. Immediately north of State Street is the Erie Canal (New York State Barge Canal), flowing approximately west to east.

Operable Unit (OU) No.1, which is the subject of this PRAP, consists of the area described above. An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

The remaining operable unit (Operable Unit 2) for this site is Tributary 3 to Brockport Creek. Tributary 3 received industrial discharges from the former 3M/Dynacolor Site and the adjacent former General Electric/Black and Decker Site. The former GE/Black and Decker Site (site #8-28-003) is being addressed through a 6NYCRR part 373 post-closure care permit. A PRAP will be prepared for Tributary 3 in the future.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The former 3M/Dynacolor Brockport facility was originally developed in 1893 by the Brockport Piano Manufacturing Company, which operated the facility until 1913. The McLaughlin Company purchased the piano plant in 1913 and manufactured galvanized pails, buckets, washtubs, and other items using an electrolytic process until 1921. By the late 1920's the site was home to a factory that manufactured boxes primarily for the shipment of canned goods. The box factory operated until the 1940's.

The Site and building were purchased by the Dynacolor Corporation in 1956. From 1956 to 1961, Dynacolor Corporation used the facility to process photographic film. 3M purchased the site in 1961 and continued to use the facility for photo processing until 1978, when 3M ceased operations at the Site. Operational buildings were demolished by 3M in 1979, and the area was covered, graded, reseeded, and maintained as a lawn. In 1985, 3M donated the site to the Town of Sweden. In 1986, the Town of Sweden transferred ownership to Brockport Cold Storage (BCS), now owned by Birdseye Foods. BCS constructed a frozen-food storage building on the approximate footprint of the former 3M/Dynacolor plant building.

During early operation of the site as a photoprocessing plant, cyanide bearing wastes were reportedly disposed on-site through the use of a leachfield located north of the building. Similar wastes were reportedly disposed off-site via direct discharges to storm sewers leading to Tributary 3. Near the end of the life of the photoprocessing operation, these cyanide bearing wastes were pre-treated at an on-site wastewater treatment plant prior to being discharged to the sanitary sewer for additional treatment at the Village of Brockport's publicly owned wastewater

treatment works (POTW). Chlorinated solvents were reportedly used for degreasing of metal parts associated with the photo-processing operation. It is unclear how waste from the small degreasing operation entered the environment. During sampling conducted by NYSDEC in 1994 hazardous waste containing PCBs was found in an on-site manhole. The manhole is believed to have been connected to the on-site wastewater treatment plant. The manhole and associated wastes were later removed.

3.2: Remedial History

3M took a number of actions to address contamination at the site prior to New York State's involvement. Those actions are summarized below:

> 1972 - Soil excavation was performed at the Former 3M/Dynacolor facility during May and June of 1972. The soil excavation and removal were part of an upgrade to the wastewater process stream at the facility, including the construction of an onsite treatment plant. Construction of the new treatment plant began in May 1972. The project included removal of an old tile drain that was previously used to dispose of process wastewater. An estimated 7,000 cubic yards of soil were excavated and removed. See figure 2 for the location of the excavation.
>
> An additional excavation was completed in 1972 involving approximately 430 cubic yards of soil. The soil was excavated and sent for silver recovery by 3M, based on soil sampling results. The area was backfilled and covered with asphalt paving for use as a parking lot. The approximate location of this excavation is immediately north of the cold storage building (see figure 2).

In 1986, the NYSDEC first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a is a temporary classification assigned to a site that has inadequate and/or insufficient data for inclusion in any of the other classifications. In 1995, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

SECTION 4: 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. 3M is the only PRP for the site, documented to date.

The NYSDEC and 3M entered into a Consent Order in June of 1998. The Order obligates the responsible party to implement a RI/FS remedial program. Upon issuance of the ROD the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between May 1998 and September 1999**.** The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Research of historical information;
- Geophysical surveys to determine depth to bedrock and to identify any buried metal objects;
- Excavation of a test pit to locate underground drainage/leach fields;
- Installation of 96 soil borings and 32 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Sampling of new and existing monitoring wells;
- Collection of approximately 6 discrete groundwater samples using a direct push technique;
- A survey of public and private water supply wells in the area around the site;

To determine whether the soil, and groundwater contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".
- Background soil samples were taken from 3 locations. These locations were near the site, but were in areas unlikely to have been affected by historic or current site operations. The samples were analyzed for SVOCs, metals and cyanide. The results of the analysis were compared to data from the RI to determine appropriate site remediation goals.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

There are three hydrogeologic zones of interest at the Site. The first zone is the overburden, which consists of fill, glacial till materials and weathered bedrock. The overburden is 4 to 18 feet thick, and contains unconfined groundwater. The average depth to groundwater is 7.5 feet below ground surface (ft bgs). Groundwater flows to the north and northwest (see figure 3) at an average seepage velocity of approximately 110 ft/year. The hydraulic gradient is steeper beneath the western portion of the site than the east. The bedrock surface is weathered and slopes to the north toward the Erie Canal. The overburden consequently thickens to the north. Downward

vertical gradients are observed in the southern, upgradient portion of the Site, while upward gradients are observed in monitoring well pairs to the north.

The overburden overlies a succession of southward dipping, primarily sandstone bedrock. The shallow bedrock zone consists of the two uppermost sandstone units, the Grimsby, and underlying Devils Hole Formations. Wells completed in the shallow bedrock are generally installed between 12 and 20 ft bgs. These units exhibit an average horizontal groundwater velocity of 55 ft/year. Groundwater flows to the northwest in the shallow bedrock (see figure 4).

The intermediate bedrock zone consists of the Power Glen Formation and the underlying Whirlpool Formation. These units are similar, consisting of predominantly sandstone. Wells completed in the intermediate bedrock unit are generally installed between 40 and 60 ft bgs. Based on slug tests performed on site and pumping tests performed off site at the former GE/Black and Decker site, the average hydraulic conductivity for the intermediate bedrock is 0.7 ft/day. These conductivity values correspond to an average groundwater velocity of 130 ft/year. Groundwater flow is primarily to the northwest, however some flow on the eastern portion of the site is influenced by groundwater recovery at the former GE/Black and Decker site and flows to the east and northeast. The intermediate bedrock overlies the Queenston Formation, which is predominantly shale that retards the vertical movement of groundwater.

5.1.2: Nature of Contamination

As described in the RI report, many soil, and groundwater samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceeded their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) (in an on-site sewer manhole), and inorganics (cyanide).

The VOCs of concern are 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethylene (TCE), and vinyl chloride (VC). These compounds(chlorinated volatile organics) vary in their toxicity with vinyl chloride being the most toxic. They volatilize readily into air but dissolve only slightly in groundwater. They can be transported in groundwater, however groundwater is not used as drinking water in the area surrounding the site. Similarly contaminated groundwater is largely limited to the site with only the bedrock groundwater containing low-level contamination off-site (see figure 4). Clean overburden groundwater is present below basements on the west side of Oxford Street (see figure 3). The initial releases of contaminants to the environment probably consisted of TCE and TCA. The remaining compounds are present as degradation products.

The SVOCs present at the site are a class of compounds called polycyclic aromatic hydrocarbons PAHs). These compounds are combustion by-products and components of petroleum and coal tar. At the 3M/Dynacolor site, they appear to be combustion by-products associated with historic fill. The historic fill is a recognizable mixture of soil, municipal solid waste, broken glass and bricks, concrete and metal debris. Based on the manmade materials it contains, the historic fill present at the site appears to have been deposited during the late nineteenth and early twentieth centuries, prior to Dynacolor's operation of the site.

Cyanide appears to be present largely as ferrocyanide, a less toxic and less soluble form of cyanide. It is therefore associated predominately with soils and to a lesser extent with groundwater. Except for contamination associated with Operable Unit 2 (Tributary 3), it is restricted to the site. No significant cyanide contamination was found on residential properties sampled west of Oxford Street. Much of the cyanide originally present at the site was removed during the IRMs described below.

PCBs were present in on-site sewer manholes. These manholes appear to have been connected to the sanitary sewer system via 3M's pretreatment plant. The manholes and the adjacent soils were removed in 1998 (see figure 2). On-site soil sampling has revealed very low (much less than 1 ppm) PCB concentrations. PCB contamination is typically associated with soils.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for waste, soil, and sediment. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in soil and groundwater and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

During the RI, blue cyanide bearing waste was discovered in the area north of the northeast corner of the (formerly Brockport Cold Storage) building. The dark blue granular material had the appearance of coal ash and exhibited cyanide concentrations of up to 2400 ppm. A portion of this material and the associated contaminated soils were removed upon discovery in 1998. To the extent practicable, the remainder of the material was removed as a part of the November 2000 IRM described below. A small amount of the material had to be left near the building footings to ensure structural stability of the building.

Waste present in on-site manholes was sampled and found to contain a number of contaminants. The waste from the manholes contained silver and cyanide at concentrations up to 170 ppm and 1950 ppm respectively. PCBs were also present in the on-site sewer manholes at concentrations up to 75 ppm (MH-1, see figure 2). These manholes appear to have been connected to the sanitary sewer system via 3M's pretreatment plant. The manholes and the adjacent soils were removed in 1998. On-site soil sampling revealed only very low (much less than 1 ppm) PCB concentrations.

Surface Soil

Prior to the IRMs described below, cyanide concentrations in surface soils ranged up to 155 ppm (see figure 5). The maximum silver concentration in these soils was 38 ppm (see figure 5) . Elevated concentrations of these contaminants were observed in the area north of the northeast corner of the Birdseye building, the drainage swale along the west side of the Birdseye parking lot, and in the northeastern portion of the site. After the numerous IRMs described below were completed, the highest cyanide concentration in surface soils that remained is 48.9 ppm (see figure 6). This location is just north of the northwest corner of the Birdseye building. The highest silver concentration remaining is 22.7 ppm (see figure 6). This location is in the northern portion of the site.

Elevated concentrations of SVOCs and lead were observed in surface soils in the northern portion of the site. The SVOCs present at the site are a class of compounds called polycyclic aromatic hydrocarbons (PAHs). These compounds are combustion by-products and components of petroleum and coal tar. At the 3M/Dynacolor site, they appear to be combustion by-products associated with historic fill. The historic fill is a recognizable mixture of soil, municipal solid

waste, broken glass and bricks, concrete and metal debris. Based on the dateable manmade materials it contains, the historic fill present at the site appears to have been deposited during the late nineteenth and early twentieth centuries, prior to Dynacolor's operation of the site. Elevated lead concentrations are also associated with the historic fill. The historic fill is most extensive on the northern portion of the site where these constituents are observed.

Subsurface Soil

Prior to the IRMs described below, cyanide concentrations in soils below 0.5 feet deep ranged up to 2400 ppm (see figure 5). The maximum silver concentration in these soils was 29.6 ppm (see figure 6). Elevated concentrations of these contaminants were observed in the area north of the northeast corner of the Birdseye building, the drainage swale along the west side of the Birdseye parking lot, and in the northeastern portion of the site. After the numerous IRMs described below (see figure 2) were completed, the highest cyanide concentration in subsurface soils that remain is 54 ppm (see figure 6). The highest silver concentration remaining is 26.9 ppm (see figure 6).

Elevated concentrations of SVOCs and lead were observed in subsurface soils in the northern portion of the site. As is discussed in the above section on surface soils, these constituents appear to be associated with turn of the century historic fill present on the site.

Groundwater

On-site groundwater is impacted with cyanide and VOCs. The cyanide impacts are limited to the overburden and shallow bedrock within the 3M Site boundary (see figure 7). VOC impacts are observed within overburden, shallow bedrock, and intermediate bedrock within the 3M site boundary (see figures 3 and 4). Limited VOC impacts in the shallow bedrock extend to just west of Oxford Street. It is, however, important to note that this very low-level contamination is at depth with uncontaminated groundwater being present in the overburden above.

Total Cyanide - The distribution of cyanide impact to groundwater is presented on figure 7. Total cyanide exceeded the SCG of 200 ppb in eight of the 32 wells sampled. Cyanide in the overburden and shallow bedrock is mainly concentrated in the center of the site near MW99-C, where total cyanide was detected at 1730 ppb and 1010 ppb in overburden and shallow bedrock wells, respectively. The maximum detected total cyanide concentration outside MW99-C wells was 377ppb. None of the deeper bedrock wells sampled exceeded SCGs.

The current cyanide plumes appear to be shrinking and concentrations show a downward trend with time. Cyanide-impacted soils were removed during the 2000, 2001 and 2002 IRMs. Reduction in groundwater concentrations is expected to continue due to the removal of the soils that had acted as a source for groundwater contamination. This will allow the effects of natural processes to further reduce contaminant concentrations in groundwater. Recent sampling supports this interpretation with substantially lower cyanide concentrations being observed than in the past.

Volatile Organic Compounds - The following VOCs exceeded the SCGs: 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethylene (TCE), and vinyl chloride (VC). The distributions of VOCs in overburden, shallow, and intermediate bedrock are presented in Table 1.

The highest VOC concentration in the overburden is located immediately north of the BCS Building at well AGM-OB. The concentration of TCA at that location was 3200 ppb. VOC concentrations decrease northward as shown on figure 3. VOCs in the shallow bedrock are highest in monitoring well MW-99C(I) with a TCA concentration of 910 ppb (see figure 4). In

the intermediate bedrock, higher concentrations of VOCs are found north of the BCS Building. However, VOC concentrations decrease significantly with depth from shallow to intermediate bedrock.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. The following IRMs were completed by 3M at the Former 3M/ Dynacolor site.

- Spring 1998 - During May 1998, a number of sewer manholes and surrounding soils were excavated and removed. This work included excavation and removal of approximately 200 cubic yards of soil. Excavations were backfilled with clean fill.

- Summer 1999 - The 6-inch diameter vitreous pipe between former manhole MH-A (excavated and removed in 1998) and Oxford Street was excavated and removed on July 13, 1999. One 90-foot long trench and one 10-foot long trench were excavated to a depth of approximately 6 feet in order to remove most of the pipe. A portion of the pipe was left in place at the west end of the excavation to avoid damaging the street. It was sealed with a cement plug. This work included removal of approximately 100 cubic yards of soil. Clean fill was placed in the trench and the asphalt parking lot was patched.

- Fall 2000 - Impacted soils were encountered around the old drain tile piping during the November 2000 interim remedial measure. Approximately 1,600 cubic yards of soils were excavated. The area was backfilled with clean fill.

- Winter 2001 - Excavation and removal of below-grade structures and soils adjacent to the former on-site wastewater treatment plant was conducted in November to December 2001. This work included removal and disposal of 3,500 cubic yards of soil and debris. The details of the work are summarized in the Former Wastewater Treatment Plant Report, submitted to the NYSDEC in January 2002.

- Fall 2001 - 3M purchased five residential properties East of Oxford Street, which are located adjacent to the site. Demolition of the structure on these properties was completed in November 2001. Demolition debris was directly loaded and disposed off-site. Approximately 1300 cubic yards of soil were excavated and disposed as a part of this work. Excavations were backfilled with clean fill and compacted.

- Spring 2002 - 3M demolished the Boy Scout Cabin located on State Street. Soils in the area surrounding the former Boy Scout Cabin and locations north of the Birdseye building containing residual cyanide, as identified by NYSDEC, were excavated in April and May 2002 (see figure 2). Approximately 550 cubic yards of soil were removed. Eight samples were collected from the perimeter and three from the bottom of the Boy Scout Cabin excavation and analyzed for available cyanide, semi-volatile organic compounds, and metals. The total cyanide concentrations in all post-excavation samples did not indicate the presence of any residual cyanide.

- Spring 2002 - Areas with residual cyanide were excavated to a lateral extent of 10 ft x 10 ft and 10 ft x 20 ft and to depths of 3 to 7 feet. Approximately 130 cubic yards of soil were removed. A summary of this soil excavation was submitted to the NYSDEC in the Structure Demolition and Soil Excavation Report, 2002.

- Fall 2002 – Landscaping improvements were completed in November of 2002. Clean top-soil was placed in low-lying areas of the site to improve storm water drainage. The approximately 100 cubic yards of soil excavated as part of tree installation was removed from the site and disposed off-site. Air monitoring was conducted during excavation activities to ensure airborne dust was minimized. Through the placement of topsoil and hydro-seeding a well developed turf cover was established.

5.3: 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 human exposure pathways can be found in Section 6 of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

There are no completed pathways which are known to exist either on-site or off-site at this time. Based upon the data that have been collected and evaluated, human exposure to contaminated groundwater and soils is not presently occurring. Potential pathways of exposure to site contaminants which could occur in the future include:

- ingestion of contaminated groundwater;
- inhalation of dusts generated by future construction activities that may result in contact with residual contamination; and
- direct contact or ingestion of soil;
- direct contact with groundwater; and
- inhalation of VOCs from contaminated groundwater.

Public water serves the area; therefore, ingestion of contaminated groundwater is unlikely. It is expected that the site will continue to be managed as commercial/industrial site; therefore, remediation and/or institutional controls (e.g., deed restrictions) will be required to mitigate the known and potential future exposure pathways.

The implemented IRMs have adequately reduced the potential for exposure to contaminants in soils. Accessible areas containing soils with elevated concentrations of cyanide have been removed, eliminating risks associated with the soils. These contaminated soils also appear to have been the source of cyanide contamination in groundwater. Their removal has also begun to reduce contaminant concentrations in groundwater. This reduction is expected to continue.

3M also proposes institutional controls to further reduce the future risk of exposures associated with the site. These institutional controls would restrict the site to commercial/industrial use and control installation of groundwater supply wells. The institutional controls would also require that any on-site excavations be performed under a site management plan that would address potential worker/community contact with residual contamination.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The ecological receptors analysis, which is included in the RI report, presents a discussion of the existing and potential impacts from the site to fish and wildlife receptors. The existence of viable plant and animal populations within and adjacent to the site is limited by the industrial and commercial nature of current land use. The site may support small mammalian species typical of urban/suburban settings such as squirrels rats, moles, voles, mice, skunks, woodchucks, opossums, and racoons. Based on the industrial nature of the site and the lack of suitable habitat for desirable species, there are no significant exposure pathways for ecological receptors within this operable unit.

Site contamination has, however, impacted the groundwater resource in the overburden and shallow bedrock at the site. While the groundwater is not used as drinking water in the vicinity of the site, it is considered a resource with its best potential use as drinking water.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to cyanide, silver and VOCs in soil and groundwater;
- environmental exposures of flora or fauna to cyanide, silver and VOCs in soil and groundwater;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and

- the release of contaminants from subsurface soil into groundwater, indoor air, and ambient air through dissolution, soil vapor, wind borne dust, etc.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards - Groundwater is not used as a drinking water source at or near the site. There is, therefore, no direct exposure to contaminants in groundwater. Cyanide and VOCs have, however, been detected in groundwater beneath the site above the NYSDEC groundwater standards. The remediation goal for groundwater at the site is to reduce the concentration of VOCs and cyanide in groundwater to 6 NYCRR Part 703.5 groundwater standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the 3M/Dynacolor site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, and groundwater at the site.

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under previously completed IRMs. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative # 2: Monitored Natural Attenuation

Present Worth: *$550,000*

Capital Cost: *$60,000*

Total OM&M:

(Years 1-5): $930,000

This remedial alternative includes monitored natural attenuation (MNA) of VOCs(consistent with USEPA guidance) and monitoring of cyanide degradation. Cyanide is limited to the central portion of the site and its concentration decreases with depth; however, no cyanide impacts were present in the intermediate bedrock. Cyanide plumes at the site are stable and concentrations are relatively low. Cyanide-impacted soil was removed throughout the site. VOCs are degrading naturally, are present in highest concentrations north of the BCS Building, and decrease with depth. Hence, MNA for and VOCs and monitoring the degradation of cyanide are possible remedial alternatives.

Estimation of natural attenuation/degradation rates and performing fate and transport modeling of the contaminants of concern (COCs) are required to estimate the time which will be required to achieve the cleanup objectives and the maximum extent of the COC impacts.

A groundwater monitoring program would be implemented. This would consist of sampling all existing and newly installed, as required, monitoring wells for VOCs along with other MNA parameters and cyanide on a semi-annual basis for a period of five years followed by an additional ten years of sampling on an annual basis to determine the change in nature and extent of the COCs. Report summaries would be submitted annually to the NYSDEC.

Institutional controls would be implemented that would restrict the site's use to industrial to prevent residential/recreational exposure to residual contamination. The institutional controls would also limit the use of groundwater to minimize the potential for exposure to contaminated groundwater.

A site management plan (SMP) would also be developed that addresses excavation and soil handling in a way that minimizes exposure to contaminants present in the soil. To address contamination beneath the building and the potential for VOC intrusion, the (SMP) would require evaluation in the event the building's use changes substantially or the area beneath the building becomes accessible.

An annual certification by the property owner that the institutional controls are in place and continue to be effective would also be required.

Alternative #3**: Groundwater Extraction and Treatment**

Present Worth: $2,080,000

Capital Cost: $604,000

Total OM&M:

(Years 1-10): $2,058,000

This remedial alternative includes mass reduction by extraction and physical treatment of impacted groundwater. The pump and treat system would be focused in the area north of the Birdseye Building. The system would consist of recovery wells screened in the overburden, shallow bedrock, and intermediate bedrock. The number of wells screened in each zone would be related to

the extent of contamination in each zone. The extracted groundwater would be treated via activated carbon absorption and chemical oxidation.

Aquifer testing, groundwater modeling, design, and planning, are required to implement this alternative. It is estimated that a pump and treat system consisting of five recovery wells pumping at a sustainable rate would be implemented for a period of five years followed by an additional five years of post-remedial monitoring and implementation of MNA.

Institutional controls would be implemented that would restrict the site's use to industrial to prevent residential/recreational exposure to residual contamination. The institutional controls would also limit the use of groundwater to minimize the potential for exposure to contaminated groundwater.

A site management plan (SMP) would also be developed that addresses excavation and soil handling in a way that minimizes exposure to contaminants present in the soil. To address contamination beneath the building and the potential for VOC intrusion, the (SMP) would require evaluation in the event the building's use changes substantially or the area beneath the building becomes accessible.

An annual certification by the property owner that the institutional controls are in place and continue to be effective would also be required.

Alternative #4**: Enhanced Reductive Dechlorination**

Present Worth: *$1,330,000*

Capital Cost: *$264,000*

Total OM&M:

(Years 1-5): *$1,228,000*

This alternative consists of groundwater treatment using an in-situ reactive zone (IRZ) technology. IRZ is a technology applicable to the treatment of VOCs in groundwater through various transformation processes. Historical groundwater monitoring data, including mass reduction of the parent product TCA and biogeochemical data indicating a reducing environment, support the conclusion that reductive dechlorination is already ongoing at the site. IRZ employs the addition of a food-grade carbohydrate reagent (a molasses-like product) to the subsurface to increase reducing conditions and provide excess organic carbon for bacteria to utilize. This process is known as enhanced reductive dechlorination (ERD). ERD should result in significantly accelerated in-situ degradation of the VOCs.

The purpose of ERD remediation is to provide an excess of organic carbon to these environments, thereby driving conditions to a more reduced state, utilizing and depleting electron acceptors, and driving degradation at much more rapid rates. Typically, these rates are increased by several hundred percent following an ERD implementation. Given the prevalence of anaerobic (lacking oxygen) conditions that already exist throughout most of the treatment area, ERD has a high probability of success for the remediation of VOCs. This remedial alternative includes ERD. Based on the nature and extent of the VOC impacts in groundwater, the proposed reactive zone is focused on the area between the BCS Building and Monitoring Wells MW99-G, MW99-C, GW-1,

and MW99-F. The total extent of the ERD system would consist of approximately 50 injection wells with wells in both the overburden and bedrock (see figure 8). Proposed groundwater monitoring wells would be used to assess groundwater quality and remediation efficiency of ERD for each geologic unit, on a quarterly basis. Groundwater monitoring and MNA(consistent with USEPA guidance) would comprise the balance of the groundwater remedy for this alternative. Monitoring would also be used to track cyanide degradation.

The objective of the carbohydrate injections would be to reach the remediation goals described in Section 6, however, continued operation of the remedial system would be reevaluated once VOC concentrations are asymptotic. Asymptotic groundwater conditions can be defined as the point of diminishing returns, when no significant changes in COC concentrations occur over successive monitoring events after initial decline of COC mass. It is estimated that asymptotic groundwater conditions can be achieved within two to three years of carbohydrate injections. A one year rebound test, which would be a component of the post-remedial monitoring program, would be implemented to assess the long-term effectiveness of the ERD system.

Institutional controls would be implemented that would restrict the site's use to industrial/commercial to prevent residential/recreational exposure to residual contamination. The institutional controls would also limit the use of groundwater to minimize the potential for exposure to contaminated groundwater.

A site management plan (SMP) would also be developed that addresses excavation and soil handling in a way that minimizes exposure to contaminants present in the soil. To address contamination beneath the building and the potential for VOC intrusion, the (SMP) would require evaluation in the event the building's use changes substantially or the area beneath the building becomes accessible.

An annual certification by the property owner that the institutional controls are in place and continue to be effective would also be required.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC will addressed the concerns raised.

In general, the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion below, the NYSDEC has selected Alternative 4 as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by continuing to reduce the contaminant mass that creates the most significant potential threat to public health and the environment, it would greatly reduce existing groundwater contamination, and it would create the conditions needed to restore groundwater quality to the extent practicable. Alternatives 2 and 3 would also comply with the threshold selection criteria but to a lesser degree and with lower certainty.

Based on the analyses conducted in this FS, it is recommended that ERD (Remedial Alternative 4) followed by MNA be implemented for VOCs at the site. Monitoring of Cyanide degradation is proposed for groundwater. In addition to being effective remedies that will be protective of human health and the environment, these alternatives will address groundwater cleanup of the site largely through implementation of in-situ technologies. Remedial Alternatives 2, 3, and 4 are protective of human health and the environment in that they mitigate current risks associated with impacted groundwater. Remedial Alternative 4 would comply with the chemical-action and location-specific remediation goals, is expected to be effective in the short-term, provide for long-term effectiveness, and is a permanent solution.

The monitored degradation portion of the remedy would reduce the toxicity, mobility, and volume of the cyanide impacts at the site since the cyanide will not migrate off-site as a result of the low solubility of the cyanide metal species. It is important to note that overburden groundwater currently meets the SCGs for cyanide.

Through the combination of active remediation (in-situ remediation) and natural attenuation processes, Remedial Alternative 4 would permanently reduce the toxicity, mobility, and volume of the VOC impacts at the site. Remedial Alternative 4 is also expected to be technically and administratively implementable.

Remedial Alternative 4 is cost effective as it addresses the known risks and provide for groundwater monitoring to evaluate the progress of remediation, and assess the effectiveness of the natural attenuation processes in reducing the residual contaminant concentrations not actively remediated.

Institutional controls that include a site management plan and limitations on the use of the site to industrial/commercial applications and restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Monroe County Health Department, would be implemented to further reduce the potential for exposure to site-related contaminants. The site management plan would include a provision for addressing contamination that may be present beneath the cold storage building in the event that the building's use changes substantially or the area beneath the building becomes accessible.

These measures would have the added benefit of limiting potential exposure to the contaminants (SVOCs and lead) associated with historic fill.

The estimated present worth cost to implement the remedy is $1,330,000. The cost to construct the remedy is estimated to be $264,000 and the estimated operation, maintenance, and monitoring costs for 5 years is $1,228,000.

The elements of the selected remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. The total extent of the ERD system would consist of approximately 50 injection wells with wells in both the overburden and bedrock(see figure 8)

2. Development of a site management plan to: (a) address residual contaminated soils that may be excavated from the site. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including a provision for mitigation of any impacts identified; and (c) address the potential for vapor intrusion in the existing cold storage building and address contamination that may be present beneath the

cold storage building in the event that the building's use changes substantially or the area beneath the building becomes accessible; and (d) identify any use restrictions.

3. The property owner would provide an annual certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department, which would certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or site management plan.

4. Imposition of an institutional control in form of an environmental easement that would: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Monroe County Health Department; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

5. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible. At the time of this determination, a work plan would be developed to perform a post-remediation evaluation of the effectiveness of the ERD system in eliminating VOC impacts.

6. Since the remedy results in untreated hazardous waste remaining at the site, a long term monitoring program would be instituted. Monitoring wells from the existing groundwater monitoring array would be selected for inclusion in the effectiveness monitoring program. The NYSDEC would also determine what additional monitoring wells will be needed to confirm the effectiveness of the remedy. This program would allow the effectiveness of the previous IRMs, the carbohydrate injection and the natural attenuation/degradation portion of the remedy to be monitored and would be a component of the operation, maintenance, and monitoring for the site.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- Numerous fact sheets and public meetings were held to discuss the status of the project.
- A public meeting was held on March 3, 2004 to present and receive comment on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1

Nature and Extent of Contamination

WASTE	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Inorganic Compounds	Total Cyanide	1950-2400	NS	NS
	Silver	ND-170	NS	NS
PCBs	Total PCBs	ND-75	50	1 of 4

PRE-IRM SURFACE SOIL[e]	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	2-Butanone	ND – 0.20	0.3	0 of 45
	Chlorobenzene	ND - 0.16	1.7	0 of 45
	Toluene	ND – 0.11	1.5	0 of 45
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND – 23.0	0.224	26 of 43
	Benzo(a)pyrene	ND – 24.0	0.061	34 of 43
	Benzo(b)fluoranthene	ND – 27.0	1.1	16 of 43
	Benzo(k)fluoranthene	ND – 13.0	1.1	17 of 43
	Chrysene	ND – 25	0.4	21 of 43
	Dibenzo(a,h)anthracene	ND – 4.80	0.014	17 of 43
	Indeno(1,2,3-cd)pyrene	ND – 5.2	3.2	1 of 43

Inorganic Compounds	Cyanide, Total	ND - 155	10	9 of 45
	Silver	ND – 38.7	10	4 of 38
	Lead	10.7 - 1340	400[d]	8 of 38

POST-IRM SURFACE SOIL[e]	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	2-Butanone	ND – 0.20	0.3	0 of 45
	Chlorobenzene	ND – 0.16	1.7	0 of 45
	Toluene	ND – 0.11	1.5	0 of 45
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND – 23.0	0.224	21 of 43
	Benzo(a)pyrene	ND – 24.0	0.061	29 of 43
	Benzo(b)fluoranthene	ND – 27.0	1.1	13 of 43
	Benzo(k)fluoranthene	ND – 13.0	1.1	13 of 43
	Chrysene	ND - 25.0	0.4	16 of 43
	Dibenzo(a,h)anthracene	ND – 4.8	0.014	14 of 43
	Indeno(1,2,3-cd)pyrene	ND – 5.2	3.2	1 of 43
Inorganic Compounds	Cyanide, Total	ND – 48.9	10	5 of 45
	Silver	ND – 22.7	10	2 of 38
	Lead	12.8 - 524	400[d]	3 of 38

PRE-IRM SUBSURFACE SOIL[f]	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	2-Butanone	ND - 0.31	0.3	1 of 107
	1,2-Dichloroethylene	ND – 0.94	0.4	2 of 107
	1,1-Dichloroethane	ND – 0.05	0.2	0 of 107
	Trichloroethylene	ND – 0.19	0.7	0 of 107
	Vinyl Chloride	ND – 0.03	0.2	0 of 107
Semivolatile Organic Compounds (SVOCs) Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND – 5.1	0.224	26 of 92
	Benzo(a)pyrene	ND – 9.0	0.061	41 of 92
	Benzo(b)fluoranthene	ND – 10.0	1.1	9 of 92
	Benzo(k)fluoranthene	ND – 4.9	1.1	8 of 92
	Chrysene	ND – 6.3	0.4	23 of 92
	Dibenzo(a,h)anthracene	ND – 1.4	0.014	23 of 92
	Indeno(1,2,3-cd)pyrene	ND – 4.1	3.2	1 of 92
Inorganic Compounds	Cyanide, Total	ND-2400	10	33 of 114
	Silver	ND – 26.9	10	14 of 62
	Lead	ND - 2390	400[d]	4 of 48

POST-IRM SUBSURFACE SOIL[f]	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	2-Butanone	ND – 0.31	0.3	1 of 107
	1,2-Dichloroethylene	ND – 0.94	0.4	2 of 107
	1,1-Dichloroethane	ND – 0.05	0.2	0 of 107
	Trichloroethylene	ND – 0.01	0.7	0 of 107
	Vinyl Chloride	ND – 0.03	0.2	0 of 107
Semivolatile Organic mpounds (SVOCs) compounds (SVOCs)	Benzo(a)anthracene	ND – 5.1	0.224	17 of 92
	Benzo(a)pyrene	ND – 9.0	0.061	28 of 92
	Benzo(b)fluoranthene	ND – 10.0	1.1	7 of 92
	Benzo(k)fluoranthene	ND – 4.9	1.1	6 of 92
	Chrysene	ND – 6.3	0.4	16 of 92
	Dibenzo(a,h)anthracene	ND – 1.4	0.014	17 of 92
	Indeno(1,2,3-cd)pyrene	ND – 4.1	3.2	1 of 92
Inorganic compounds	Cyanide, Total	ND – 54.0	10	15 of 114
	Silver	ND – 26.9	10	12 of 62
	Lead	ND - 2390	400[d]	4 of 48

PRE-IRM OVERBURDEN GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 1000	5	10 of 117
	1,1-Dichloroethane	ND - 940	5	13 of 117
	1,1-Dichloroethene	ND - 760	5	8 of 117
	1,2 - Dichloroethene	ND – 394	5	24 of 117
	Trichloroethene	ND - 1100	5	24 of 117
	Tetrachloroethylene	ND – 17	5	1 of 117
	Vinyl chloride	ND – 31	2	30 of 117
Inorganic Compounds	Cyanide, total	ND - 1730	200	16 of 117

POST-IRM OVERBURDEN GROUNDWATER [g]	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 940	5	1 of 14
	1,1-Dichloroethane	ND - 530	5	1 of 14
	1,1-Dichloroethene	ND - 610	5	1 of 14
	1,2 cis - Dichloroethene	ND.0 – 24	5	2 of 14
	Trichloroethene	ND - 300	5	2 of 14
	Tetrachloroethylene	ND – 17	5	1 of 14
	Vinyl chloride	ND – 42	2	2 of 14
Inorganic Compounds	Cyanide, total	ND - 339	200	0 of 14

PRE-IRM BEDROCK GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 910	5	15 of 142
	1,1-Dichloroethane	ND - 780	5	19 of 142
	1,1-Dichloroethene	ND - 390	5	18 of 142
	1,2 -Dichloroethene	ND - 67	5	22 of 142
	Trichloroethene	ND - 1100	5	22 of 142
	Tetrachloroethylene	ND – 9	5	1 of 142
	Vinyl chloride	ND - 52	2	30 of 142
Inorganic Compounds	Cyanide, total	ND - 1010	200	8 of 142

POST-IRM BEDROCK GROUNDWATER [g]	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 3200	5	5 of 23
	1,1-Dichloroethane	ND - 780	5	7 of 23
	1,1-Dichloroethene	ND - 390	5	5 of 23
	1,2 cis -Dichloroethene	ND - 67	5	5 of 23
	Trichloroethene	ND - 320	5	5 of 23
	Tetrachloroethylene	ND – 9	5	1 of 23
	Vinyl chloride	ND - 52	2	10 of 23

POST-IRM BEDROCK GROUNDWATER [g]	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Inorganic Compounds	Cyanide, total	ND - 235	200	2 of 23

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter
ND = Not Detected
[b] SCG = standards, criteria, and guidance values;
NS = no appropriate standard
[d] SBL =Site Background Level
[e] = Surface sample includes depths 0-0.5 feet below ground surface
[f] = Subsurface sample includes depths greater that 0.5 feet below ground surface
[g] = Most recent (May 2003) groundwater results

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	OM&M	Total Present Worth
# 1: No Further Action	$0	$0	$0
#2: Monitored Natural Attenuation	$60,000	$930,000	$550,000
#3: GroundwaterExtraction/Treatment	$604,000	$2,058,000	$2,080,000
#4: Enhanced Reductive Dechlorination	$264,000	$1,228,000	$1,330,000

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Former 3M Dynacolor Site
Operable Unit No. 1
Brockport, Monroe County, New York
Site No. 8-28-066

The Proposed Remedial Action Plan (PRAP) for the Former 3M/Dynacolor 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 was issued to the document repositories on February 23, 2004. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Former 3M/Dynacolor site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 3, 2004, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 22, 2004.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

COMMENT 1: Which direction does the groundwater flow from the site?

RESPONSE 1: Groundwater at the site flows to the northwest.

COMMENT 2: Were PCBs found on 3M's site in the manholes? How did PCBs get in the manholes if 3M didn't use PCBs?

RESPONSE 2: Yes, there were PCBs found in on-site manholes. The origin of the PCBs is not known.

COMMENT 3: What were the levels of VOCs and cyanide in the historic fill? Did any of these contaminants flow north into Lake Ontario?

RESPONSE 3: The VOCs and cyanide were not significantly elevated in the historic fill. Cyanide was, however, detected at concentrations of up 2400 ppm in on-site soils. Those soils were removed as a part of one of the earlier interim remedial measures. VOCs were detected in concentrations up to approximately 3400 ppb in groundwater.
Contaminants of concern have been found as far north as the confluence of Tributary 3 and Brockport Creek. That location is approximately 1 mile north of the site. There is no evidence that the site has impacted Lake Ontario. This ROD addresses Operable Unit 1 (the site located at 180 State Street). A PRAP will be prepared in the future that addresses the Tributary 3 investigation and cleanup.

COMMENT 4: How far north has the contamination flowed?

RESPONSE 4: Contaminants associated with Tributary 3 have been found only as far north as the confluence of Tributary 3 and Brockport Creek. That location is approximately 1 mile north of the site. The investigation and cleanup of Tributary 3 will be addressed in a PRAP that will be completed in the future.

The contamination being addressed by this ROD is largely restricted to the site. The only exception is very low level VOC contamination that was detected on the west side of Oxford Street in the bedrock. VOCs have not been detected above groundwater standards in the off-site overburden, above (directly beneath the houses) the bedrock.

COMMENT 5: Did any of the cyanide and other contaminants from the site get into the canal?

RESPONSE 5: In 1998 , the New York State Department of Health sampled sediment in the Erie Canal. Data from that sampling did not document site-related contamination in the canal.

COMMENT 6: What are VOCs? Please put in laymen's terms.

RESPONSE 6: VOCs are volatile organic compounds. They are chemical compounds that contain carbon in their molecular structure and evaporate readily. Examples of VOCs present on the site include trichloroethane (TCA), and trichloroethene. These chlorinated solvents were used for degreasing of metal parts.

COMMENT 7: Did the PCBs found on the 3M/Dynacolor site effect people?

RESPONSE 7: The PCBs found on-site were present in sewer manholes, that were cleaned and removed. The NYSDEC is not aware of human exposures to these materials. Workers involved in the cleanup operated under a Health and Safety Plan that specified appropriate protective measures to minimize their potential for exposure.

COMMENT 8: The DEC was issuing permits to flush out the lines and pipes into the Canal. The public here mentioned that wasn't a good idea, so you started putting that waste in tanker trucks. When are you planning on cleaning up the Barge Canal?

RESPONSE 8: There was no flushing of pipes to the canal from the 3M/Dynacolor site. There was extensive sewer cleaning at the Former GE/Black & Decker site located at 200 State (next door to the former 3M/Dynacolor site). However, waste from that operation was not flushed to the canal. Waste from the sewer cleaning associated with the 200 State Street Site was collected in vacuum trucks, treated and ultimately disposed off-site. This is the way the waste handling from the sewer cleaning was initially proposed and was completed.

The sampling described above in response 5 did not document contamination in the Erie Canal from the 3M/ Dynacolor site. Cleanup of the Erie Canal is therefore beyond the scope of the 3M/Dynacolor cleanup.

COMMENT 9: When will you clean up the mercury in the Canal?

RESPONSE 9: Mercury is not a site-related contaminant at the 3M/Dynacolor site nor do we have information indicating that the adjacent Canal is contaminated with mercury.

COMMENT 10: The canal doesn't need to be cleaned up, State and Oxford Streets need to be cleaned up.

RESPONSE 10: The comment is noted.

COMMENT 11: I'm confused about your earlier presentation and another clean up. Didn't the Village, 3M & DEC clean this site up in 2001? Why are you telling us its not cleaned up yet?

RESPONSE 11: A significant amount of cleanup has been completed at the site. Additional work is being proposed to address remaining residual contamination at the site.

COMMENT 12: Have you been monitoring the groundwater for 4 years? Have you seen changes in the ratios of VOCs? Has there been natural attenuation going on? Is the breakdown product chloroethane, as toxic as vinyl chloride?

RESPONSE 12: Groundwater at the site has been monitored since 1998 with limited monitoring going back as far as 1995. The current VOC concentration in a given well is generally less than in 1998. Additionally, the highest TCE concentration at the site was 1100 ppb. In the most recent sampling event, the highest TCE concentration was 300 ppb. TCA concentrations have generally decreased as well but to a lesser degree.

The presence of breakdown products in the groundwater clearly indicates that natural attenuation is currently taking place. The addition of molasses will enhance the existing natural processes.

Chloroethane is not as toxic as vinyl chloride. The chloroethane will also breakdown resulting in innocuous components.

COMMENT 13: Is this site going to be cleaned up to industrial standards, or not?

RESPONSE 13: New York State does not currently have standards specific to industrial properties. The same Standards, Criteria, and Guidance (SCGs) were used to evaluate the 3M/Dynacolor site as are used for other sites in New York. These SCGs are protective of public health and the environment.

COMMENT 14: During the time you've been monitoring the area by the Boy Scout cabin, what has the shift of VOCs been? Why did the concentrations go down? Was the soil removed?

RESPONSE 14: The VOC concentrations are slightly lower in the northern portion of the site than they were in the past.

The concentrations are probably lower due to the natural attenuation that is taking place. It is unlikely that this was caused by removal of contaminated soils from the site. The soils that were removed were contaminated with cyanide and did not contain VOCs at concentrations that would have made them a source for the VOC contamination in groundwater.

COMMENT 15: Have any of the groundwater contaminants or cyanide moved over or across or under the canal to the areas where you already cleaned up? What about contamination through the creek, which could then recontaminate people's yards?

RESPONSE 15: There are uncontaminated monitoring wells between the areas where contamination is present and the Creek and Canal. We are, therefore, confident that the groundwater contamination associated with the 3M/Dynacolor is restricted to the south side of the canal.

Because of the extensive soil removals completed at the site there are currently no areas remaining at the surface of the site that could contribute cyanide contaminated soil for erosion to the creek. There is also a well developed turf cover across the unpaved portions of the site to reduce the possibility for any soil erosion.

The extensive sampling completed in the storm sewer that drains to the creek, does not indicate that the 3M/Dynacolor site is contributing any significant contamination to the drainageway.

COMMENT 16: Since the DEC has been involved, how many cubic yards of soil have been removed during the cleanup?

RESPONSE 16: Approximately 7000 cubic yards have been removed since 1997.

COMMENT 17 Where was the excavated contaminated soil taken?

RESPONSE 17: It was taken to solid waste facilities (landfills) permitted to accept the waste.

COMMENT 18: Did 3M state there was no need to remove soils since they did the excavations of soils in the 1970's? If this isn't an issue, why are our houses gone?

RESPONSE 18: The remedial investigation identified cyanide contaminated soils that were removed during the IRMs identified during the public meeting and described in the ROD.

3M chose to negotiate the purchase and to demolish the adjacent residential properties.

COMMENT 19: Did 3M know where they were dumping the cyanide?

RESPONSE 19: The cyanide contamination is in part associated with disposal systems that were in use when the facility operated. Those systems were actively managed by the operators of the site. It is unclear which of the site's owners was in control when the releases of cyanide occurred.

COMMENT 20: Why is there such a big difference in costs of the proposed remedies? Which process has been proven to work the best? Is the remedy selection based solely on costs?

RESPONSE 20: Some of the potential remedies have higher initial capital costs associated with their implementation, whereas others have more lengthy or more expensive operation and maintenance. NYSDEC considers the proposed remedy to have the highest potential for success.

Cost is one of several criteria considered in selecting the remedy such as protection of public health and the environment, implementability, short and long-term effectiveness, etc. The least expensive alternative considered is not being selected.

COMMENT 21: Will the Village have to approve the remedy?

RESPONSE 21: No, the cleanup will be completed under the State's authority. The public meeting and the public comment period does, however, offer the public including the Village the opportunity to provide input.

COMMENT 22: Why did the Village's consultant say the houses didn't need to get knocked down?

RESPONSE 22: NYSDEC cannot speak for the village or its consultant.

COMMENT 23: What is this carbohydrate injection and how does it work? Will you use molasses or a molasses-like product?

RESPONSE 23: It is a process that involves injection of a carbohydrate into the groundwater. Food grade molasses will be used. The carbohydrates provide food for the natural microbes in the soil. This generates an environment favorable for the microbes that are best suited to breaking down the chlorinated organic present at the site.

COMMENT 24: Can the bacteria eat toxins?

RESPONSE 24: Yes, the contaminants (VOCs) act as a food source for the bacteria.

COMMENT 25: Besides the 3 proposed remedy choices, were others looked at? What about chemical oxidation?

RESPONSE 25: Yes, other technologies were evaluated but were eliminated during an earlier part of the screening process. Chemical Oxidation was considered, but was eliminated from consideration because of potential site specific safety concerns.

COMMENT 26: When the cleanup is complete, will the DEC still monitor the site? Will the NYSDEC be involved? Can 3M sell the land to the Village so that the Village could to turn the site into a park?

RESPONSE 26: Yes, the site will continue to be monitored under plans approved by NYSDEC. 3M could sell the property but its use would be dictated by the institutional controls described in the ROD. The institutional controls include a provision that the site's use be restricted to commercial/industrial.

COMMENT 27: When you turn water anaerobic, you get smells. If you turn soil anaerobic won't there be potential side effects like smells, methane gas? Don't bacteria give off methane gas? Can gas bubble up through the soil? Is there any downside or risks to this type of treatment? Will carbon dioxide or fermentation occur?

RESPONSE 27: NYSDEC has experience with carbohydrate injection at other sites. Odors have not been a problem at those sites, nor do we expect there to be unpleasant odors associated with the carbohydrate injection at the 3M/Dynacolor site. The gases typically diffuse through the pores in the soil into the atmosphere without incident because there is only one building present on the site. Because of building construction and use, NYSDEC does not expect vapor accumulation to be a problem in the cold storage building.

COMMENT 28: Is there anything, like toxins, that shouldn't mix with the molasses? Can the molasses form something toxic when it comes in contact with the contamination?

RESPONSE 28: There is nothing present at the 3M/Dynacolor site that is incompatible with molasses.

COMMENT 29: When you are creating more bugs to eat the contamination, won't there be a pest problem? Is it bugs or bacteria?

RESPONSE 29: The proposed remedy would increase indigenous bacterial populations. These bacteria would breakdown the VOCs. It would not cause a pest problem.

COMMENT 30: Doesn't groundwater flow through the bedrock? Will you be pumping out the contamination in the bedrock?

RESPONSE 30: Yes, groundwater flows through the bedrock. The remedy involves injecting carbohydrates into the groundwater in both the overburden and bedrock. It relies on introducing materials into the subsurface rather than extracting groundwater.

COMMENT 31: Do any of the bedrock wells show high contamination near the homes on Oxford Street across from the site?

RESPONSE 31: Very low level VOC contamination was detected on the west side of Oxford Street in the bedrock. VOCs have not been detected above groundwater standards in the overburden above (directly beneath the houses) the bedrock.

COMMENT 32: Can you build a home on the cleaned up site?

RESPONSE 32: Institutional controls associated with the proposed remedy will restrict the site to commercial/industrial uses.

COMMENT 33: Are you leaving contaminants under the building? Will you inject molasses under the building? Why wouldn't this contamination under the building eventually flow out?

RESPONSE 33: While we do not have data from beneath the building, the groundwater data from near the building and file information suggest that there is contamination beneath the building. Any contamination beneath the building has been there at least 18 years. Given a groundwater flow rate of approximately 100 feet per year, contaminant concentrations are unlikely to significantly increase in the groundwater flowing from beneath the building.

The design details regarding the extent to which molasses will be injected under the building have not yet been decided.

COMMENT 34: Do you have legal standing to do the cleanup?

RESPONSE 34: New York State has the authority to require the cleanup.

COMMENT 35: If the cold storage building was removed can you go and clean up that site?

RESPONSE 35: Yes, the institutional controls included in the remedy for the site require action in the event the area currently under the building becomes accessible.

COMMENT 36: Are you leaving contamination under the building because of expenses? Why can't you tear the building down?

RESPONSE 36: The contaminant concentrations at the site, do not warrant tearing down the building.
COMMENT 37: Are the people who work in the cold storage building exposed to contaminates of concern? Are there vapor intrusions there? Will there be an investigation there? Will there be institutional controls there?

RESPONSE 37: We do not have reason to believe that workers in the cold storage are being exposed to significant concentrations of contaminants from the site. There are institutional controls included in the remedy that require action in the event the building's use changes or the area beneath the building becomes accessible.

COMMENT 38: Does the State or 3M clean the site up?

RESPONSE 38: New York State selects the remedy and 3M will design and implement the remedy under the State's review, approval and oversight.

COMMENT 39: When will you move north and clean up the ridge in Clarkson? Have you found anything in the creek north of the ridge?

RESPONSE 39: The nature and extent of contamination associated with the 3M/Dynacolor site has been defined and the contamination does not extend to the areas described. No work is proposed for the area described.

COMMENT 40: Did you take samples of fish and frogs in Trib 3 and find PCBs in them? How about the fish in Brockport Creek? Are the sediments of the creeks contaminated? Do these creeks have contamination from the Barge Canal?

RESPONSE 40: Because of the intermittent urbanized nature of Tributary 3, there is a very limited fauna present. The biota in Tributary 3 was not, therefore, sampled. PCBs have been found in the fish in Brockport Creek. Fish in Brockport Creek continue to be evaluated under a Biomonitoring Program conducted by General Electric.

Contamination present in the Tributary is a result of discharges to Tributary 3. Tributary 3 as well as many other creeks in the area pass under the Canal through a pipe and are not directly connected to the canal.

COMMENT 41: Do you draw a line and only go so far in your sampling? If you found contamination in the creek, why didn't you continue along the creek, and sample further up north from the source of contamination?

RESPONSE 41: The objective of a remedial investigation is to define the nature and extent of contamination that may be present at the site (both on-site and off-site). This objective was met at the 3M/Dynacolor site. The extent of contamination was defined on-site as well as off-site in Tributary 3.

COMMENT 42: I wrote a letter to you about a couple who dug an boat inlet on the canal. They were fined by the DEC for removing hazardous soils. If the DEC knows the canal is contaminated, why wouldn't you include cleaning up the canal?

RESPONSE 42: Please see the response to comment #8.

COMMENT 43: DEC and DOH tell you contaminates were found but 3M & GE have denied everything. All the DEC has the power to do is ask the companies to clean the sites up.

RESPONSE 43: The NYSDEC has authority under State Superfund to require clean up of the site. The completion of the IRMs at the site, and the selection of this remedy demonstrates that NYSDEC is using this authority.

COMMENT 44: Is there a monitoring plan in place for many years out into the future? How many years of monitoring will that plan specify?

RESPONSE 44: There will be long-term monitoring of the site. While the specific conditions of the long-term monitoring plan have not been finalized, NYSDEC anticipates that an initial phase of monitoring will last approximately 5 years. After five years, the monitoring plan will be reevaluated to determine what additional monitoring may be appropriate.

COMMENT 45: Are the 50 wells, monitoring wells or injection wells or both? Do the wells go beyond Oxford Street?

RESPONSE 45: They are injection wells in addition to the existing 32 monitoring wells. Additional monitoring wells will also be needed.

All of the injection wells will be located near the Cold Storage building and the parking lot area to the north. There are currently monitoring wells along the west side of Oxford Street.

COMMENT 46: Is there a specific number of goals or standards you are trying to reach with this cleanup? How long will this take?

RESPONSE 46: The specific remediation goals are those listed in Section 6 of the ROD. For example, the Part 703 groundwater standards are the remediation goals for groundwater.

COMMENT 47: Your presentation mainly deals with groundwater. Is your main concern the groundwater? What about the soils?

RESPONSE 47: The VOCs present in groundwater, are the only contaminated media not yet addressed at the site. The selected remedy will address this outstanding issue.

Many of the issues associated with soils have previously been addressed through the Interim Remedial Measures (IRMs) completed at the site. The ROD addresses the remaining concerns associated with soils through institutional controls.

COMMENT 48: What is the timetable for the injection system to be built?

RESPONSE 48: NYSDEC anticipates that construction of the system would begin during the 2004 construction season.

COMMENT 49: After 3-5 years of monitoring and follow up, if there's more VOCs found, will you follow up with another anaerobic phase?

RESPONSE 49: In the event that VOC's concentrations were to increase or remain elevated, additional carbohydrate treatments would be completed or other additional remedial measures would be evaluated.

COMMENT 50: Does this cleanup take 3M off the hook?

RESPONSE 50: No.

COMMENT 51: Where is the funding for this cleanup coming from? Did 3M assume responsibility?

RESPONSE 51: 3M has agreed to pay for costs associated with the RI/FS. A legal agreement that addresses installation, operation, maintenance, monitoring, and reimbursement of the State's costs for the remedy is currently under negotiation between 3M and the State.

COMMENT 52: Are there any risks of human exposures to these contaminants?

RESPONSE 52: Yes, there are potential risks associated with exposure to the contaminants present on the site, however, we do not believe that anyone is currently exposed.

COMMENT 53: Is this site considered safe?

RESPONSE 53: The selected remedy is protective of human health and the environment.

COMMENT 54: Is the TCE and TCA close to the maximum levels allowed? Is the TCE contamination insignificant? What about the breakdown products such as vinyl chloride–can that break down anaerobically?

RESPONSE 54: TCE and TCA are both significantly above their respective groundwater standards of 5 ppb. In recent sampling events the maximum TCA concentration is 3200 ppb whereas TCE has been detected at a concentration of 300 ppb. Because anaerobic degradation of TCA does not produce vinyl chloride and the TCE concentrations are much lower than the TCA concentrations, we do not expect to generate a significant amount of vinyl chloride. Vinyl chloride can be broken down under anaerobic conditions.

COMMENT 55: What does "no completed exposure pathways" mean?

RESPONSE 55: It means that to the best of our knowledge no one is currently being exposed to contaminants from the site.

COMMENT 56: Will the molasses speed up the processes at the groundwater treatments centers on Lyman St? Can the molasses be used with the groundwater treatments? Will this speed things up? Will the molasses injections affect the groundwater treatment centers at all?

RESPONSE 56: Both the Lyman Street and 200 State Street groundwater extraction and treatment systems rely on hydraulic containment and mass removal for cleanup. Carbohydrate injection is a completely different approach. There are also a number of significant differences between the sites. The degree to which the use of carbohydrate injections would be appropriate at the 200 State Street site or near the Lyman Street Collection system is beyond the scope of the remedy selection for the 3M/Dynacolor site.

COMMENT 57: What is the volume of molasses? How far does it spread? Will the molasses spread to Lyman or Oxford Streets?

RESPONSE 57: The plans are not final and volumes will require adjustment after initial start-up, based on monitoring. The current estimates are that approximately 50 to 100 gallons of a 10 to 20 percent molasses solution will be injected in each of 56 injection points. This will likely take place every 2 weeks for the first 3 months. The injections would then be reduced to monthly. The molasses solution costs 30 to 50 cents per gallon.

The molasses will only spread a short distance in the subsurface on the site. We do not anticipate an off-site impact from the molasses.

COMMENT 58: If the site is restricted, how will you keep children out? How will you know that kids won't go over there to play and dig up soils? Is it ok for children to be playing and digging in the dirt at the old site? I think that the site should be posted with no trespassing signs so that people know that it isn't intended for recreational use.

RESPONSE 58: While we do not consider short-term trespass to represent a health threat, the site is private property and is not intended for public use. 3M has indicated that they will establish a local agent to enforce a no-trespassing policy. 3M has indicated that they will post the site with no-trespassing signs to clearly delineate the site as private property.

COMMENT 59: Why wasn't historic fill removed? Why didn't 3M take that out?

RESPONSE 59: The historic turn of the century fill represents such a large volume of material that is not practical to remove. The contaminants contained in the fill are not very mobile and therefore can be effectively managed through the institutional controls in the ROD. With the institutional controls contained in the ROD, there should be no exposure to the contaminants present in the historic fill.

COMMENT 60: . Why will the site be restricted to commercial, yet your telling us the site will be safe?

RESPONSE 60: The institutional control that restricts the site's use to commercial/industrial is proposed as an additional measure of protection used to prevent exposure to the residual contaminants present at the site.

COMMENT 61: If a company wants to come and build on this site, will more soil have to be removed? What would happen then? Who would pay for future DEC evaluations?

RESPONSE 61: The future handling of soil will be addressed in the proposed Site Management Plan (SMP). The SMP dictates that soil handling would be protective of public health and the environment. Responsibility for reimbursement of the State's costs would remain with 3M.

COMMENT 62: Would the main injection well be drawing groundwater to it?

RESPONSE 62: No, the molasses will be added to the groundwater rather than the groundwater being extracted.

COMMENT 63: Is the pipe under the canal receiving contaminated storm water or groundwater or both? Why wouldn't this water effect the people north of the canal?

RESPONSE 63: The groundwater contamination is well defined and is restricted to a small area a significant distance away from the storm sewer and the canal. Additionally there are no exposed soils with significant contaminant concentrations present on the site to contribute contaminants to surface water runoff.

COMMENT 64: Has the molasses injection system been used successfully elsewhere?

RESPONSE 64: Yes, this approach has been used effectively at a number of site in New York and across the country.

COMMENT 65: Is the groundwater by the Senior Center being tested and monitored?

RESPONSE 65: Yes, there is a monitoring well cluster in the grassy area to the east of the Senior center parking lot that is monitored routinely.

COMMENT 66: Is DEC still finding cyanide and silver off-site? Is this associated with the storm sewers? Are these levels higher than the PCB levels found off-site?

RESPONSE 66: The Tributary 3 investigation and cleanup will be the subject of a PRAP that will be prepared in the future. A relatively small amount of soil contamination has been defined beneath the storm sewer pipe in the neighborhood north of the canal. Cyanide silver and PCBs have been detected above the cleanup levels used for the Segments 1, 2, and 3 soils/sediment removals recently completed.

COMMENT 67: Is anyone looking into the health repercussions for these people? Did you get the cancer study results back yet?

RESPONSE 67: NYSDOH completed a study that evaluated PCB concentrations in the blood of residents along Tributary 3. NYSDOH also conducted a cancer incidence study. Results of that study will be provided to the public during the month of March 2004. A public meeting will be held on March 30, 2004 to present those results.

COMMENT 68: If enhanced reductive dechlorination remedy is chosen, how often would testing be necessary to evaluate the success/nonsuccess of the remedy chosen? How many years are properties going to be subjected to possible contamination existing?

RESPONSE 68: The performance sampling frequency has not yet been decided but will be more frequent at the beginning of the project than near its end. The NYSDEC anticipates that the injections will continue for approximately 2 to 3 years.

COMMENT 69: Has contamination been contained or is there still a threat of contamination traveling north under Canal through Tributary 3 ? The contaminants at the 3M/Dynacolor site are not currently impacting Tributary 3 or the properties north of the Canal.

RESPONSE 69: Please see responses 3 and 4.

COMMENT 70: Has all the tar been removed from storm sewer piping?

RESPONSE 70: General Electric has indicated that they will submit a work plan for replacement of the sewer piping including removal of the associated tar in April 2004.

Katie Winogrodzki, Environmental Engineer for 3M submitted a letter (dated February 24, 2004) which included the following comment:

COMMENT 71: Based on 3M's investigations of the former 3M/Dynacolor operations, there is no evidence of generation nor disposal of PCB contaminated waste. Therefore, 3M proposes the following change:

In Section 1, the first paragraph, third sentence reads: "As more fully described in Section 3 and 5 ...resulted in the disposal of hazardous waste, including cyanide, metals, volatile organic compounds (VOCs) and Polychlorinated biphenyls (PCBs)."

3M proposes the following changes to this sentence: "As more fully described in Section 3 and 5 ...resulted in the disposal of hazardous waste, including cyanide, metals, and volatile organic compounds (VOCs). Polychlorinated biphenyls (PCBs) were also discovered in manholes on the property."

RESPONSE 71: The following language was included in the ROD "As more fully described in Section 3 and 5 ...resulted in the disposal of hazardous waste, including cyanide, metals, and volatile organic compounds (VOCs). Hazardous waste containing the above constituents and polychlorinated biphenyls (PCBs) was found in on-site sewer manholes.

Paul William Hare, Regional Manager for The General Electric Company's Environmental Remediation Program submitted a letter (dated March 22, 2004) which included the following comments:

COMMENT 72: The PRAP recommends in-situ enhanced biodegradation to address volatile organic compounds (VOCs) in both overburden and bedrock groundwater at the former 3M/Dynacolor facility. While we understand the rationale for recommending this alternative, we are concerned about the potential negative impacts on the pump-and-treat system that GE and Black & Decker are operating at the adjacent 200 State Street property. The pump-and-treat system draws groundwater from the former 3M/Dynacolor facility.[1] The extracted groundwater is

[1] This is supported by the available data, including both water-level measurements and groundwater quality results. For example, cyanide has been detected in the effluent from the

treated in a packed-tower air stripper, and then discharged to the New York State Barge Canal (Barge Canal) pursuant to a SPDES Permit.

For the reasons discussed below, GE and Black & Decker are concerned that the remedy recommended in the PRAP could negatively impact the ability of the pump-and-treat system to meet current effluent limitations, may lead to additional monitoring and reporting requirements, and create problems with operation and maintenance of the system, leading to increased costs. *We request assurance from NYSDEC that GE and Black & Decker will be protected from increased compliance risk and the potential costs associated with responding to impacts from the implementation of the recommended remedy. We also request a monitoring program and controlled dosing to mitigate the risks presented herein.*

Compliance Concerns

The recommended remedy will alter the groundwater chemistry by creating the deeply reducing conditions necessary to completely degrade VOCs. The pH may also be somewhat reduced. The solubility of naturally-occurring metals, such as iron and manganese, is greatly increased under these conditions. The SPDES Permit for the 200 State Street system includes monitoring requirements and discharge limits for iron and pH. However, treatment has not been necessary to meet the discharge limits for iron for the 15 years that the pump-and-treat system has been operating. Likewise, no pH adjustment has ever been needed to maintain the effluent between 6.0 and 9.0 Standard Units (SU). *GE and Black & Decker should not be exposed to increased compliance risk for iron and pH as a result of implementation of the proposed remedy.*

The SPDES Permit for the pump-and-treat system does not currently require monitoring for manganese. In the event that such monitoring is required, the monitoring, and any necessary reporting, should be performed by the entity implementing the proposed remedy. *GE and Black & Decker should not bear any increased monitoring and reporting costs for manganese resulting from implementation of the proposed remedy. In addition, GE and Black & Decker should not bear the compliance risk if NYSDEC modifies the SPDES Permit for the 200 State Street facility to include a discharge limit for manganese.*

O&M Concerns

The proposed remedy could also cause operation and maintenance (O&M) problems and/or higher costs for the pump-and-treat system. The existing system has three recovery wells, designated RW-1B, RW-2 and RW-3, in an artificial fracture zone that is 450-feet long and was created by controlled blasting techniques. There is potential for the chemistry of the groundwater entering the western end of the fracture zone to change during implementation of the proposed remedy, which could lead to fouling problems, both within the artificial fracture zone and within various components (e.g., pumps, pipelines, valves, air stripper, etc.). Fouling has not been a significant issue to date.[2] An increase in fouling caused by implementation of the proposed remedy could result in a decrease in the percentage of time that the pump-and-treat system is operating and, therefore, a decrease in the effective average pumping rate of the system. *GE and Black & Decker should not bear the responsibility for these and other associated negative consequences. GE and Black & Decker should also not bear any increased O&M costs that result from implementation of the proposed remedy.*

Performance Monitoring & Dosing

NYSDEC should require implementation of a performance monitoring program to assess the potential alteration of groundwater chemistry near the western end of the extraction system at the 200 State Street property throughout implementation of the proposed remedy.[3] This will probably require the installation of additional

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pump-and-treat system. Already, NYSDEC modified the State Pollutant Discharge Elimination System (SPDES) Permit for the groundwater remediation system at the 200 State Street property to require monitoring and reporting for amenable cyanide in the effluent.

monitoring wells, located between the extraction system and the proposed injection wells on the former 3M/Dynacolor facility.

The PRAP does not appear to specify the dosing of the molasses for the proposed remedy. However, a newspaper article on the public meeting that was held on March 3, 2004 stated that molasses would be injected into more than 50 wells in "as little as two days."[4] GE and Black & Decker are quite concerned about such a massive dosing. Once the molasses is injected into the subsurface, the reactions will proceed in an uncontrolled manner. Although monitoring can document the effects of the enhanced in-situ biodegradation, including potential or actual negative impacts on the pump-and-treat system operating on the adjacent 200 State Street property, it will not be possible to control those effects. *Thus, NYSDEC should require that the injection be performed in a carefully-controlled manner over an extended period of time based on the results of ongoing performance monitoring.* In this way, the rate and/or location of injection can be altered to minimize the potential for negative impacts on the pump-and-treat system.

[4] Operation of the pump-and-treat system began in May 1988. The packing inside the air stripper had to cleaned in December 1995, and was replaced in November 2001.
[4] At minimum sampling should be performed before the injection begins to establish baseline conditions. Monitoring should continue throughout the period during which enhanced in-situ biodegradation is occurring (e.g., two to three years based on the newspaper article referenced elsewhere in these comments), and for some additional period thereafter.[4] See "DEC urges sweet cleanup of toxic site in Brockport" by Corydon Ireland in the March 4, 2004 issue of the *Democrat & Chronicle*.

RESPONSE 72: The Department does not anticipate a negative impact on the collection or treatment system at the 200 State Street Site from the remedy at the 3M/Dynacolor Site and will make every effort through its review and approval process to ensure that this is the case. The Department agrees that additional monitoring wells will be needed to further define flow just west of the 200 State Street fractured bedrock trench and to monitor water quality. The Department will require a performance monitoring program with base-line sampling prior to the initial injection. Sampling completed early in the implementation phase of the project will be used to adjust dosing volumes and frequency.

The Department will not consider nor has 3M proposed the single massive carbohydrate injection as may have been implied by the local media.

As General Electric noted the details of the design are not included in the PRAP or ROD but will be specified in the design document for the remedy. This document is not yet under the Department's review. General Electric's comments will be considered in the Department's review of the design document for the remedy at the 3M/Dynacolor site.