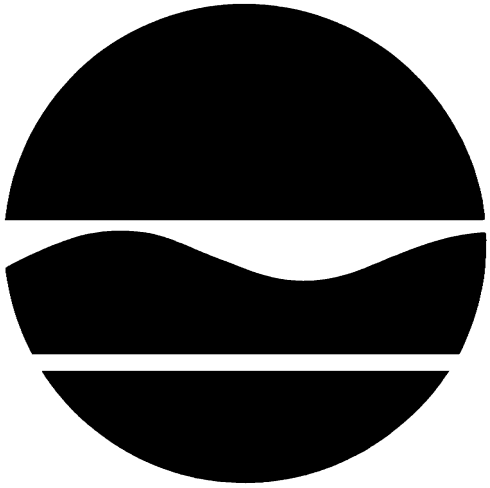
PROPOSED REMEDIAL ACTION PLAN
ALCAN SHEET AND PLATE COMPANY
Town of Scriba, Oswego County, New York
Site No. 7-38-015

Operable Unit No. 1 - North Ponds and Marshes
Operable Unit No. 2 - Main Landfill
Operable Unit No. 3 - South Pond, Marsh and Tributary 63

February 2006



Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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ALCAN SHEET AND PLATE COMPANY SITE

Town of Scriba, Oswego County, New York
Site No. 7-38-015
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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Alcan Sheet and Plate Company Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, discharges of contaminated coolant water have resulted in the disposal of hazardous waste, consisting of PCBs. This waste has contaminated the sediments, surface soils and surface water at the site, and has resulted in:

- a significant threat to human health associated with potential exposure to PCBs.
- a significant environmental threat associated with the impacts of contaminants to biota in the ponds, marshes and Tributary 63.

To eliminate or mitigate these threats, the NYSDEC proposes the following remedies:

Operable Unit No. 1 - North Ponds 1 and 2, Marshes 1, 2 and 3, and the Cold Mill Landfill

- Sediments exceeding 1 ppm of PCBs in the North Ponds would be removed and disposed off-site. These excavations would be covered with a geotextile fabric and a one foot clean soil cover. In some locations, restoration would require additional clean soil to ensure adequate slope stability.
- Sediments exceeding 1 ppm of PCBs in the Marshes would be removed and disposed off-site. These excavations would be backfilled with clean soil to original grades.
- Soils which exceed 10 ppm of PCBs in upland areas of the North Ponds and Marshes would be removed and disposed off-site. The excavated areas would then be backfilled with a minimum one foot of clean soil. In some locations, restoration would require additional clean soil to ensure these areas retain “upland” status.
- Upland areas in the North Ponds and Marshes where PCB contamination in soil ranges from 1 to 10 ppm would be covered with 1 foot of clean soil.
- Soils in the vicinity of the Cold Mill landfill and pump station, which exceed 1 ppm would be excavated to a depth of

one foot and backfilled with clean soil to original grades.

Operable Unit No. 2 - Main Landfill

- No further action would be required. Because localized, low-level contamination exists, an environmental easement restricting use of groundwater within the vicinity of the landfill would be necessary. Also, a Site Management Plan would be developed to address maintenance and monitoring requirements, including a plan to routinely assess groundwater quality and the integrity of the cover system.

Operable Unit No. 3 - South Pond, South Marsh, and Tributary 63

- Sediments within the limits of the South Pond, South Marsh and along the main flow path through Segments B and C of Tributary 63, would be excavated to a depth which encounters underlying native material and disposed off-site. In addition, any sediments where visual evidence of petroleum globules or sheen is apparent during excavation would be subject to removal and off-site disposal. The extent of this additional removal would be determined during the remedial action. The excavations would then be backfilled with clean soil to original grades.

Common Technical Elements - All Operable Units

- A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

- Excavated soils and sediments would be transported for off-site disposal in accordance with applicable rules and regulations. Removal areas would generally be based on the results of the Remedial Investigation sampling, however, in some areas, additional sampling would be necessary during the design to determine excavation limits.

- Following removal, documentation samples would be collected from the limits of the excavation areas and submitted for laboratory analysis. Site restoration would occur following the collection of these samples. Restoration would include placement of a minimum of one-foot of clean soil in all of the removal areas. Additional material would be placed, when necessary, in select areas to approximate pre-existing grades, followed by seeding/planting of disturbed soil areas.

- The details of the restoration program would be addressed by the remedial design. Restoration of the excavated pond/marsh/tributary areas would meet the substantive requirements of 6 NYCRR Part 663, Freshwater Wetlands Permit Requirements Regulations.

- A site management plan (SMP) would be developed and implemented. The SMP would identify the institutional controls and engineering controls (IC/ECs) required for the remedy and would detail their implementation. The SMP for this remedy would include:
(a) An IC/EC control plan to establish the controls and procedures necessary to;
(i) manage residual contaminated soils that may be excavated from the site during future activities, including procedures for characterization, handling, health and

safety of workers and the community as well as, disposal/reuse in accordance with applicable NYSDEC regulations and procedures, (ii) maintain use restrictions regarding site development or groundwater use identified in the environmental easement; and (iii) require the property owner to provide an IC/EC certification, as required by regulations, on a periodic basis; and (iv) a monitoring plan to monitor biota and groundwater at the site.

- Imposition of an institutional control in the 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 uses consistent with wetland and adjacent industrial use only; (c) restrict the use of groundwater within the vicinity of the Main Landfill as a source of potable water, without necessary water quality treatment as determined by NYSDOH; and (d) require the property owner to complete and submit to the NYSDEC an annual certification.

The proposed remedies, discussed in detail in Section 8, are intended to attain the remediation goals identified for this site in Section 6. The remedies 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.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedies, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select final remedies for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the 1997 North Ponds Investigation Report, the 2004 Focused Remedial Investigation (RI) Report, the 2006 "Feasibility Study" (FS), and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Oswego School District Public Library
120 East Second Street
Oswego, New York 13126
Telephone: (315) 341-5867
Hours of Operation:
M-F 10:00 am to 8:00 pm
Sat./Sun. 12:00 pm to 5:00 pm
Contact: Ms. Carol Ferlito, Director

NYSDEC Region 7 Office
615 Erie Boulevard West
Syracuse, NY 13204-2400
Telephone (315) 426-7403
Hours of Operation: M-F 8:30am to 4:45pm
Contact: Ms. Diane Carlton
Citizen Participation Specialist

NYSDEC Central Office
625 Broadway
Albany, NY 12233-7014
Telephone (518) 402-9564
Hours of Operation: M-F 8:30am to 4:45pm
Contact: Mr. Wayne Mizerak, Project Manager

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from February 27, 2006 to March 28, 2006 to

provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for March 13, 2006 at the Town of Scriba Municipal Building beginning at 7:00 PM.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedies. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.
Written comments may also be sent to Mr. Mizerak at the above address through March 28, 2006.

The NYSDEC may modify the proposed remedies or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the NYSDEC's final selection of the remedies for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Alcan Sheet and Plate Company site is located approximately 4 miles east of the City of Oswego on Lake Road North (County Route 1A) in the Town of Scriba, Oswego County, New York (see Figure 1). The Alcan Oswego Works Facility, which occupies the site, is situated on an approximately 506-acre parcel owned by Alcan (now known as Novelis Corporation). This property is bordered by Lake Road North and North Road to the south/southeast, undeveloped and partially developed lands to the west, and Lake Ontario to the north/northwest. The Sithe Energies, Inc. cogeneration plant, known as the Independence Station, borders Alcan's property to the northeast (see Figure 2).

North of the operating facility are two ponds (North Ponds 1 and 2) and three marshes (Marshes 1, 2 and 3) used at various times as retention areas to lower the temperature of Alcan's process cooling water before it was discharged into Lake Ontario. Near the site's southern boundary is another pond (South Pond) and a small marsh (South Marsh). Along the southern and western boundary, is a small stream (Tributary 63). Downstream of Tributary 63 is Teal Marsh, an off-site wetland area that receives surface water drainage from the tributary.

The Cold Mill Landfill, a small construction and demolition debris landfill associated with the construction of the facility's Cold Mill, is located to the south of North Pond 2. Another landfill, the approximately 10-acre Main Landfill, is situated east of North Pond 1. This landfill was used by Alcan from 1963-1978 for the disposal of office trash, wooden pallets and construction debris.

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. This site has been divided into three operable units:

- **Operable Unit No. 1 (OU-1)** consists of all elements of the cooling treatment system (North Ponds 1 and 2, and Marshes 1, 2 and 3) plus the Cold Mill Landfill. This area occupies approximately 21 acres.

- **Operable Unit No. 2 (OU-2)** consists of the Main Landfill. The landfill occupies approximately 10 acres.

- **Operable Unit No. 3 (OU-3)** consists of the South Pond (7,500 sq. ft.), South Marsh (30,000 sq. ft.), and Tributary 63 (approximately 4,500 linear feet).

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The manufacturing processes at the facility currently use approximately 10 million gallons per day (mgd) of cooling water. Water is drawn from Lake Ontario through a submerged intake structure. From 1968 to 2002, the ponds and marshes of OU-1 were utilized as a once-through cooling water treatment system. The cooling water was used in various contact and non-contact cooling processes through the facility prior to being discharged. These areas provided treatment of the cooling water through oxidation, settling of entrained solids, and natural cooling prior to discharge into Lake Ontario under a State Pollutant Discharge Elimination System (SPDES) Permit. This area was designed to provide a long residence time and slow flow rates. Settleable solids were separated out from the water throughout the approximately one-half mile flow path. In mid 2002, Alcan ceased using these ponds and marshes, now using a cooling tower and a recirculation system to treat their process cooling water.

During the late 1960's and early 1970's, PCBs were incidentally discharged into the North Ponds 1 and 2 and Marshes 1, 2, and 3. Discharge of cooling water into Marsh 3 ceased sometime in the 1970's. In the South Pond and Tributary 63 (OU-3), only non-contact water had been discharged by Alcan. PCB contamination has been documented, however, it is unknown when and how the PCBs were released into the South Pond, South Marsh, and Tributary 63.

The Main Landfill (OU-2) was operated from 1963-1978, receiving approximately 80,000 cubic yards of office trash, wooden pallets and construction debris. Around 1970, small quantities of rags and absorbent materials containing minor amounts of PCBs from a transformer leak were reportedly disposed of in the Main Landfill.

3.2: Remedial History

In June 1980, PCBs were first detected in Alcan's process water discharge. A sampling program and file search determined that fire resistant hydraulic fluids containing PCBs were the source of the contamination.

Several physical modifications to the ponds and marshes, and changes to the cooling water flow path were implemented during the operational history of the OU-1 treatment system. Modifications to ponds and wetlands that were implemented in 1980 include the installation a fish weir at the discharge point from Marsh 2, the discharge from the northwest corner of North Pond 2 was eliminated, and the reinforcement of the berm between North Pond 2 and Lake Ontario.

In December 1983, the NYSDEC listed the Alcan Sheet and Plate Company 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 1989, NYSDEC completed a Phase I Preliminary Site Assessment Report and, in December 1990, a Phase II Preliminary Site Assessment Report. In 1997, Alcan issued the North Ponds Investigation Report which reported sediment, surface soil, groundwater, surface water, and biota sampling results. Following the 1997 site investigation and risk assessment, a fence was constructed to prevent access to OU-1.

Based on the above information, in August 1998, the site was listed on the Registry as a Class 2 site. A Class 2 site is defined as a site which poses a significant threat to human health and/or the environment.

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.

The NYSDEC and the Alcan Aluminum Corporation entered into a Consent Order on October 7, 2000. The Order obligates the responsible parties to implement a Focused RI/FS remedial program. After the remedy is selected, the NYSDEC will approach the PRPs to implement the selected remedies 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 Focused RI was conducted between 2002 and 2004. 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 survey to determine depth to bedrock;
- Installation of 5 soil borings and 5 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Sampling of 14 new and existing monitoring wells;
- An assessment of public and private water supply wells in the area around the site;
- Collection of 4 surface water samples;
- Collection of 128 aquatic sediment samples;
- Collection of 25 surface soil samples;
- The thickness of the soil cover of the landfill was measured at 33 locations;
- Collection of biota samples consisting of 60 fish samples.

In previous investigations from 1980 to 1997, summarized in the November 17, 1997 North Ponds Investigation Report, the following activities where undertaken which provided the basis for developing the Focused RI:

- Collection of 398 aquatic sediment samples;
- Collection of 10 surface soils samples;
- Collection of biota samples including 44 fish, 7 vegetative samples and one turtle sample; and
- Installation of 10 soil borings and 10 monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions.

To determine whether the sediment, surface soil, subsurface soils, groundwater, and/or surface water contains contamination at levels of concern, data from the investigations 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".

- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

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

Regionally, all surface water eventually flows towards the north into Lake Ontario. At the site, all surface water in OU-1 is prevented from flowing into Lake Ontario by a small concrete dam. Groundwater generally flows to the northwest towards the lake. The overburden soils are a till consisting largely of a poorly sorted, dense, fine to medium sand with variable amounts of fine to medium gravel and silt. Bedrock ranges from 4 to 24 feet below grade and is typically the Oswego Sandstone, which is comprised of gray, fine-to-medium-grained quartz sandstone. The bedrock generally has low permeabilities and low water yields. The upper zone of rock is more highly fractured than at depth with area domestic wells typically being with the first 75 feet of bedrock. The site is generally flat with a total relief of about 25 feet. The depth to groundwater ranges from 0 to 10 feet.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater, surface water, sediment and biota samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main category of contaminants that exceed their SCGs are polychlorinated biphenyls (PCBs).

PCBs tend not to be mobile through solution in groundwater or surface water, tending to sorb (stick) onto the organic matter in soils and sediments. The primary mode of transport is the suspension of PCB-sorbed sediment particles into flowing surface water. The suspended particles eventually settle out when the flow slows down, however, they can be re-suspended under more turbid conditions and transported further.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media evaluated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for 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 sediments, surface soils, subsurface soils, surface water 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.

Surface Soil

Four surface soil samples were collected for the 1990 North Ponds Sediment Sampling Program and six samples were collected in conjunction with the 1997 North Ponds Investigation Report. The maximum concentration detected during these two investigations was 20 ppm PCBs (vs. the cleanup objective of 1 ppm). This sample was located in the vicinity of the Cold Mill Landfill. The next highest concentration was 2.3 ppm. PCBs were not detected in five of the ten samples.

During the RI, twenty five additional surface soil samples were collected. The maximum concentration (10.2 ppm) was again located in the vicinity of the Cold Mill Landfill, however, of an additional eight samples collected from this area, only two (1.7 ppm and 1.1 ppm) were above the recommended cleanup objective.

Among the 17 surface soil samples collected throughout the balance of the site, only two (3.52 ppm and 2.26 ppm) were above 1 ppm. The remaining fourteen samples were below 1 ppm, with nine samples not detecting any PCBs. This supports that, in general, the surface soils surrounding the contaminated ponds and marshes are not a concern.

In November 2001, Alcan began to use a cooling water recirculation system whereby contact and non-contact cooling water is recovered and reused. With the operation of this new system, by mid-2002, water flow through the ponds and marshes ceased. As a result, the hydraulic character of the ponds and marshes changed. The footprint of each of the marshes as well as that of North Pond 2 decreased significantly. As a result, areas that were once submerged are now uplands. Since these areas are now upland, they have been assessed and would be remediated pursuant to soil (i.e., not sediment) criteria. This is reflected in Table 1.

The maximum PCB concentrations in the newly emerged upland areas of Marsh 1, 2 and 3 areas are 330 ppm, 65 ppm, and 520 ppm, respectively. The two highest surface soil concentrations in North Pond 2 (21 and 24 ppm) are similar to the 20 ppm surface soil sample previously found in the adjacent Cold Mill Landfill area. Further characterization of PCBs in the surface soils in these areas would be assessed as an element of the remedial design.

Subsurface Soil

In the Marsh 1, 2, and 3 areas, some of the sediment samples were reclassified as (upland) subsurface soil samples as described above. This is reflected in Table 1. The maximum subsurface soil concentrations identified in Marshes 1, 2 and 3 are 134 ppm, 72 ppm, and 52 ppm, respectively.

In Marsh 1, subsurface soil samples were collected at four locations. Based on the data collected, no consistent trend was evident when evaluating the quality of subsurface vs. surface soils. For example, in one sample location, the PCB concentration in surface soil was less than 1 ppm, but increased to 134 ppm at the next interval (0.5 to 1.0 foot). A second sample had a surface sample contamination of 250 ppm, but was below the subsurface SCG by the next sample interval (0.5 to 1.0 feet).

Marsh 3 by comparison appears to have a more predictable contaminant distribution. There are no instances where contaminant concentrations increase with depth. Also, significant levels of contamination have not been found below a depth of one foot. This may be because Marsh 3 was removed from the cooling treatment system fairly soon after it was contaminated.

The need for additional characterization to define the depth of subsurface soil removal in North Pond 2, Marsh 1 and Marsh 2 would be assessed during the remedial design.

Groundwater

In 1997, PCB contamination was observed in one monitoring well (MW-5) between North Pond 2 and Lake Ontario. A concentration of 0.152 ppb was detected. By 2002, the PCB level at this location dropped to 0.083 ppb. In MW-7, 0.066 ppb of PCBs was detected. The groundwater standard for PCBs 0.090 ppb.

Localized, low-level volatile organic compound (VOC) contamination has also been detected in the vicinity of the Main Landfill in MW-1, MW-7, MW-10 and MW-12. The VOC compounds detected include: chloroethane (20.8 ppb in MW-1 and 20.8 ppb in MW-7, vs. the standard of 5 ppb), 1,1-dichloroethane (11.8 ppb in MW-10, vs. the standard of 5 ppb). Low-level contamination by semivolatile organic compounds (SVOCs) was also observed in MW-12. Compounds include: 1,2-dichlorobenzene (3.11 ppb) and 1,4-dichlorobenzene (3.53 ppb). The groundwater SCG for both of these compounds is 3 ppb.

Inorganic (metals) contamination was detected at concentrations exceeding SCGs within each groundwater sample except those collected from MW-6 and MW-9. The metals exceeding SCGs were iron, magnesium, manganese, and sodium. These metals are generally consistent with mineral content that would be expected in shallow groundwater.

While some PCB, VOC, SVOC, and inorganic (metals) groundwater contamination is present at this site, it is present only at low-levels and is localized. Therefore, groundwater remediation is not viewed as necessary, though continued monitoring is recommended.

Surface Water

In October 1980, PCBs were first detected in Alcan's SPDES surface water discharge at a concentration of 0.46 ppb. A fish barrier was subsequently installed to limit sediment disturbance. A 1982 report stated that 95% of the succeeding weekly sampling showed no detectable PCBs (<0.01 ppb) and no discharge greater than 1 ppb of PCB was recorded.

In 1994, surface water samples were collected from North Pond 1 (one sample), North Pond 2 (one sample), Marsh 1 (two samples), and Marsh 2 (one sample). No PCBs were detected in these samples.

In 1996, nine surface water samples were collected in order to evaluate the distribution between dissolved PCB and suspended particulate PCB contamination in the surface water. In all samples, the dissolved fraction tended to be greater than the suspended PCB concentrations. An additional eight samples were analyzed only for total PCBs with no phase distribution evaluated. The maximum total PCB concentration was 0.508 ppb.

In October 2002, four surface water samples were collected at four different locations in Tributary 63. No PCBs were detected in these samples.

Sediments

The sediment samples collected during the RI had a maximum concentration of 1,275 ppm in Marsh 3, at a depth interval of 0-0.5 feet. The maximum PCB sediment concentration in each of the remaining areas are as follows: North Pond 1 (max. 94.08 ppm at a depth interval of 2.5-3.0 feet), Marsh 1 (max. 380 ppm at a depth interval of 0-0.5 feet), North Pond 2 (max. 260 ppm at a depth interval of 3.5-4.0 feet), Marsh 2 (max. 60 ppm at a depth interval of 0-0.5 feet), South Pond (max. 158.2 ppm at a depth interval of 0.5-1.0 feet), and Tributary 63 (max. 23.57 ppm at a depth interval of 0-0.5 feet).

Additional characterization of the depth of impacts would be needed during the remedial

design. To date, the maximum depth of contamination in all soil/sediment medium in each of the areas is: North Pond 1 (3.5-4.0 feet), North Pond 2 (5.0-5.5 feet), Marsh 1 (1.5-2.0 feet), Marsh 2 (3.0-3.4 feet), Marsh 3 (1.0-1.5 feet), South Pond (0.5-1.0 feet).

Biota Sampling

During the North Ponds Investigation (October-November 1995 and August 1996), fish sampling was undertaken in each of the areas where PCBs had been detected: North Pond 1 (3 samples, max. 2.8 ppm), Marsh 1 (8 samples, max. 39 ppm), North Pond 2 (7 samples, max. 28 ppm), and Marsh 2 (6 samples, max. 27 ppm and 1 turtle sample, 3.2 ppm). No fish samples were collected from Marsh 3 because it was dry.

During the same investigation, vegetation (milfoil) biota sampling in each of the areas detected PCBs as follows: North Pond (2 samples, none detected), Marsh 1 (2 samples, max. 2.6 ppm), North Pond 2 (1 sample, 0.6 ppm), and Marsh 2 (2 vegetative, max. 0.71).

During the RI, biota sampling was conducted in Tributary 63 and in Teal Marsh. Fish sampling consisted of composite, whole-body, and skin-off fillets. Sample results from the Tributary 63 area ranged from non-detect to 8.05 ppm. Sample results from the Teal Marsh area ranged from non-detect to 2.85 ppm. Teal Marsh is downstream of Tributary 63 and further away from the South Pond discharge. In general, concentrations of PCBs in fish samples decreased in the samples taken further downstream of South Pond.

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.

There were no IRMs performed at this site during the RI/FS.

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 5 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.

A potential future exposure pathway exists at the site. Receptors could come into direct contact with PCBs in surface soil or sediments and incidentally ingest those PCB-contaminated

media. Current exposures have been eliminated by fencing the contaminated ponds, marshes and adjacent upland areas and limiting access to only those individuals necessary for maintenance and patrol. There is no residential development in the contaminated areas, groundwater will not be consumed and the PCBs do not present a potential for vapor intrusion.

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 Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors. The following environmental exposure pathways and ecological risks have been identified:

- Sediments in the pond/marsh and tributary areas contain levels of PCBs that are predicted to affect the growth and survival of benthic organisms and to bioaccumulate in fish and terrestrial animals. This results in the potential for reduced availability of food for forage species and in reproductive effects in fish, terrestrial wildlife and birds.

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 PCBs in sediments and surface soils and surface water in OU-1 and in sediments and surface water in OU-3;

- environmental exposures of flora or fauna to PCBs in sediments and surface soils and surface water in OU-1 and in sediments and surface water in OU-3;

- the release of contaminants in OU-2 from soil into groundwater that may create exceedances of groundwater quality standards; and

- the release of contaminants from sediment into surface water in OU-1 and OU-3 through turbulence by stream flow or fish and animal activity along the sediment/water interface.

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

- 1 ppm PCBs for surface soils and 10 ppm PCBs for subsurface soils; and

- 1 ppm PCBs for sediments.

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 Alcan Sheet and

Plate Company 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 are 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 sediments, at the site.

For the purposes of this discussion, soil refers to soil in established and in newly emerged upland areas. Sediments refer to the sediments in the ponds and marshes, and in Tributary 63.

Alternative 1: No Action

Present Worth: $65,600
Capital Cost: $0
Annual OM&M: $8,500

Operable Unit No. 1

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. The No Action Alternative would not involve the implementation of any remedial activities to remove, treat, contain, or monitor constituents of interest in soil or sediment. The alternative relies on natural attenuation processes to reduce the concentrations of PCBs in soil and sediment. The site would be allowed to remain in its current condition, and no activities would be undertaken to change the current conditions.

Operable Unit No. 2

Since the Main Landfill is a closed landfill, OU-2 would be subject to No Further Action under this alternative. Under the No Further Action alternative, the Main Landfill (OU-2) would remain in its present condition. No additional remedial activities would be implemented. The depth of the soil cover meets the specifications required for landfill closure at the time of closure, and no significant impact to human health or the environment has been identified. Because localized, low-level contamination exists, an environmental easement restricting use of groundwater within the vicinity of the landfill would be necessary. Also, a Site Management Plan (SMP) would be developed to address maintenance and monitoring requirements, including a plan to assess groundwater quality and the integrity of the cover system.

Operable Unit No. 3

Under this alternative the South Pond, South Marsh and Tributary 63 (OU-3) would not be subject to implementation of any remedial activities to remove, treat, contain, or monitor constituents of interest in sediments. The alternative relies on natural attenuation processes to reduce the concentrations of PCBs in sediments. The site would be allowed to remain in its current condition, and no activities would be undertaken to change the current conditions.

Alternative 2: Removal of Marsh Sediment (above 1 ppm), North Pond Sediment (1 foot depth), Soil and Installation of Soil Cover

Present Worth: $14,100,000
Capital Cost: $13,950,000
Annual OM&M:
(Years 1-10): $13,500
(Years 11-30): $5,000

Operable Unit No. 1

Under this alternative, soil and sediment in the OU-1 pond and marsh areas would be excavated and transported for off-site disposal in accordance with applicable rules and regulations. The areal extent of the soil and sediment removals would be determined based on concentrations of PCBs exceeding 1 ppm. The depth limitation and goal of the removal, as well as method of restoration, would vary between the areas to be addressed.

For the sediments in the North Ponds, the top one foot would be removed and disposed off-site. The excavations would be covered with a geotextile fabric and a one foot clean soil cover.

For the sediments which remain in Marshes 1, 2 and 3, a minimum of one foot of sediment would be removed, with the final depth determined by a remedial objective of 1 ppm. In the excavated areas, clean soils would be placed back to original grades.

For soil in the areas around the North Ponds and Marshes 1 and 3, excavation would extend to a depth where the maximum concentration remaining would be 10 ppm. The excavated areas would then be covered with clean soil to an elevation which would keep the area as "upland", with a minimum one foot minimum soil cover.

In general, excavations of soils in Marsh 2 would follow the same criteria as in Marshes 1 and 3, but portions of Marsh 2, where contamination is slightly greater than 10 ppm (but less than 20 ppm) would be covered with one foot of clean soil.

Upland areas in the North Ponds and Marshes where PCB contamination in soil ranges from 1 to 10 ppm would be covered with 1 foot of clean soil.

Soils in the vicinity of the Cold Mill landfill and pump station, which exceed 1 ppm would be excavated to a depth of one foot and backfilled with clean soil to original grades.

Operable Unit No. 2

Under this alternative, the Main Landfill (OU-2) would remain in its present condition, consistent with that described under the No Action Alternative. No additional remedial activities would be implemented. The depth of the soil cover meets the specifications required for landfill closure at the time of closure, and no significant impact to human health or the environment has been identified. Because localized, low-level contamination exists, an environmental easement restricting use of groundwater within the vicinity of the landfill would be necessary. Also, a SMP would be developed to address maintenance and monitoring requirements, including a plan to assess groundwater quality and the integrity of the cover system.

Operable Unit No. 3

For OU-3, this alterative would excavate the sediments within the limits of the South Pond, South Marsh and along the main flow path through Segments B and C of Tributary 63 (see Figure 3), to a depth which encounters underlying native material. In addition, during the excavations, any sediments where visual evidence of petroleum globules or sheen is apparent would also be subject to removal and off-site disposal. The extent of this additional removal would be

determined during the remedial action. The excavations would then be backfilled with clean soil to original grades.

General Conditions - All Operable Units

A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

Excavated soils and sediments would be transported for off-site disposal in accordance with applicable rules and regulations. Removal areas would generally be based on the results of the Remedial Investigation sampling, however, in some areas, additional sampling would be necessary during the design to determine excavation limits.

Following removal, documentation samples would be collected from the limits of the excavation areas and submitted for laboratory analysis. Site restoration would occur following the collection of documentation samples. Restoration would include placement of a minimum of one-foot of clean soil in all of the removal areas. Additional material would be placed, when necessary, to approximate pre-existing grades, followed by seeding/planting of disturbed soil areas.

The details of the restoration program would be addressed by the remedial design. Restoration of the excavated pond/marsh/tributary areas would meet the substantive requirements of 6 NYCRR Part 663, Freshwater Wetlands Permit Requirements Regulations.

As an element of the design, a Site Management Plan (SMP) would be developed. The SMP would include a monitoring program which includes post-remedial biota monitoring, groundwater monitoring and routine inspection of the landfill (OU-2) cover system. The SMP would also maintain use restrictions regarding site development or groundwater use identified in the environmental easement, and would require the property owner to provide a periodic IC/EC certification.

The provisions of the environmental easement and SMP would extend to all operable units. The SMP would identify the institutional controls and engineering controls required for the remedy and would detail their implementation.

This alternative would result in the removal and off-site disposal of an estimated 36,350 cubic yards of contaminated soil and sediment, and an estimated 8,300 pounds of PCBs.

Alternative 3: Removal of Sediment (above 1 ppm), Soil (1 ppm/10 ppm) and Installation of Soil Cover

Present Worth: $17,500,000
Capital Cost: $17,350,000
Annual OM&M:
(Years 1-10): $13,500
(Years 11-30): $5,000

Operable Unit No. 1

The elements of this alternative which address the sediments in the Marshes are identical to Alternative 2. The excavation and removal of the sediment in the North Ponds, however, would continue beyond the one foot limit. That is, excavation would continue until a remedial objective of 1 ppm has been achieved. As in Alternative 2, the excavations in the North Ponds would then be covered with a geotextile fabric and a minimum one foot clean soil cover. In some locations, restoration would require additional clean soil to ensure adequate slope stability.

Under this alternative no soils above 10 ppm would remain in the North Marsh 2. Marsh 2

would be remediated consistent with the criteria employed for soil in Marshes 1 and 3, under Alternative 2.

Operable Unit No. 2

The elements of this alternative are identical with those described under Alternative 2.

Operable Unit No. 3

The elements of this alternative are identical with those described under Alternative 2.

General Conditions - All Operable Units

The general conditions associated with this alternative are identical with those described under Alternative 2.

This alternative would result in the removal and off-site disposal of an estimated 45,800 cubic yards of contaminated soil and sediment and an estimated 9,040 pounds of PCBs.

Alternative #4: Removal of Sediment (above 0.2 ppm), Soil (1 ppm/10 ppm) and Installation of Soil Cover

Present Worth: $20,300,000
Capital Cost: $20,150,000
Annual OM&M: $8,500

Operable Unit No. 1

The soils in the North Ponds and Marshes would be excavated according to the same criteria in Alternative 3.

The sediments in the North Ponds and Marshes would be excavated until a remedial objective of 0.2 ppm has been achieved. The excavations would then be filled with clean soil to original grades. In general, it is expected that this would result in excavating an additional one foot in the ponds and an additional six inches in the marshes.

Operable Unit No. 2

The elements of this alternative are identical with those described under Alternative 2.

Operable Unit No. 3

This alterative would excavate the sediments within the limits of the South Pond, South Marsh and along the main flow path through Segments B and C of Tributary 63 which contain PCBs greater, using a remedial objective of 0.2 ppm. As in Alternative 3, any sediments where visual evidence of petroleum globules or sheen is apparent during excavations, would also be subject to removal and off-site disposal. The extent of this additional removal would be determined during the remedial action. The excavations would then be filled with clean soil to original grades.

General Conditions - All Operable Units

The general conditions associated with this alternative are consistent with those described under Alternative 2, except as noted below.

To document post-excavation conditions, samples would be collected within the limits of the excavation and submitted for laboratory analysis. Any post-excavation sampling exceeding the 0.2 ppm remedial goal would require further excavation. The results of the sampling would be included in the certification report to be prepared at the conclusion of remedial activities.

This alternative would result in the removal and off-site disposal of an estimated 58,400 cubic yards of contaminated soil and sediment and an estimated 9,100 pounds of PCBs.

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-Effectiveness. 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 are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued

describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing Alternative 3, Removal of Sediment (above 1 ppm), Soil (1 ppm/10 ppm) and Installation of Soil Cover as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 3 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 removing the soils and sediments that create the most significant threat to public health and the environment. It would greatly reduce the source of contamination available to the biota. Alternatives 2 and 4 would also comply with the threshold selection criteria, though Alternative 2 would do so to a lesser degree or with lower certainty.

Because Alternatives 2, 3 and 4 would satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2, 3 and 4 would all have similar short-term impacts (e.g., transport of contaminated media, import of clean fill). The time needed to achieve the remediation goals would be similar for Alternatives 2 and 3, but considerably longer for Alternative 4. The increase in volume excavated under Alternative 4 would result in increased short term impacts (i.e., greater handling of contaminated sediment) and a longer duration for the project.

Achieving long-term effectiveness would be best accomplished by excavation and removal of the contaminated soils and sediments (Alternatives 3 and 4). Using an engineered cap (Alternative 2) would not be as effective in the long-term, because hazardous concentrations of PCBs would remain in the sediments. Alternative 4 would be only slightly more favorable than Alternative 3 as a relatively small increase in PCB removal would be realized.

Each of the alternatives could be implemented at the site. Alternatives 2 would be the most straight-forward to implement, results of the FRI would be adequate to plan and conduct these activities. Alternative 3 would be more difficult to implement than Alternative 2, due to the increased depth of sediment removed in the OU-1 Ponds. Alternative 4 would require additional soil and sediment sampling, and would also require the additional characterization, handling, transportation, and disposal of a substantially larger quantity of soil and sediment than Alternative 2.

When removing sediments, there are inherent operational difficulties that would limit the cleanup level which can practically be achieved. Limitations are caused in part by resuspended sediments subsequently mixing and resettling within the removal area, ultimately resulting in an overlying layer of sediments containing PCBs. Given the complications associated with achieving a 0.2 ppm remedial goal, the less extensive approaches proposed in Alternatives 2 and 3 to achieve the RAOs are considered more implementable than Alternative 4.

For Alternatives 2, 3 and 4, the excavation and removal would reduce the toxicity, mobility and volume of PCBs as each action involves excavation and off-site disposal of contaminated media. Alternative 2 satisfies this criteria to a lesser degree as a lower volume of material would be removed, and the alternative relies on a

engineered cover system to contain (rather than remove) that which remains. The PCB mass removals estimated for the various alternatives are 8,300 pounds, 9,040 pounds and 9,100 pounds, for Alternatives 2, 3 and 4, respectively.

The cost of the alternatives vary significantly. Each of the alternatives would include a removal and cover component. Alternative 3 would remove an additional 740 pounds of PCBs vs. Alternative 2. Alternative 4 would remove an additional 60 pounds of PCBs vs. Alternative 3, but require excavation, handling and disposal of an additional 12,600 cubic yards of soil/sediment. The $2.8 million dollar cost increase for Alternative 4 (vs. Alternative 3) would bring only limited improvement.

Alternative 3, although more expensive, would be a more permanent remedy than Alternative 2.

The estimated present worth cost to implement the remedy is $17,500,000. The cost to construct the remedy is estimated to be $17,350,000 and the estimated average annual operation, maintenance, and monitoring costs for 1-10 years is $13,500 and for 11-30 years is $8,500.

The elements of the proposed remedy for each of the Operable Units are as follows:

Operable Unit No. 1 - North Ponds 1 and 2, Marshes 1, 2 and 3, and the Cold Mill Landfill

- Sediments exceeding 1 ppm of PCBs in the North Ponds would be removed and disposed off-site. These excavations would be covered with a geotextile fabric and a one foot clean soil cover. In some locations, restoration would require additional clean soil to ensure adequate slope stability.

- Sediments exceeding 1 ppm of PCBs in the Marshes would be removed and disposed off-site. These excavations would be backfilled with clean soil to original grades.

- Soils which exceed 10 ppm of PCBs in upland areas of the North Ponds and Marshes would be removed and disposed off-site. The excavated areas would then be backfilled with a minimum one foot of clean soil. In some locations, restoration would require additional clean soil to ensure these areas retain “upland” status.

- Upland areas in the North Ponds and Marshes where PCB contamination in soil ranges from 1 to 10 ppm would be covered with 1 foot of clean soil.

- Soils in the vicinity of the Cold Mill landfill and pump station, which exceed 1 ppm would be excavated to a depth of one foot and backfilled with clean soil to original grades.

Operable Unit No. 2 - Main Landfill

- No further action would be required. Because localized, low-level contamination exists, an environmental easement restricting use of groundwater within the vicinity of the landfill would be necessary. Also, a Site Management Plan would be developed to address maintenance and monitoring requirements, including a plan to routinely assess groundwater quality and the integrity of the cover system.

Operable Unit No. 3 - South Pond, South Marsh, and Tributary 63

- Sediments within the limits of the South Pond, South Marsh and along the main flow path through Segments B and C of Tributary 63, would be excavated to a

depth which encounters underlying native material and disposed off-site. In addition, any sediments where visual evidence of petroleum globules or sheen is apparent during excavation would be subject to removal and off-site disposal. The extent of this additional removal would be determined during the remedial action. The excavations would then be backfilled with clean soil to original grades.

Common Technical Elements - All Operable Units

- A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

- Excavated soils and sediments would be transported for off-site disposal in accordance with applicable rules and regulations. Removal areas would generally be based on the results of the Remedial Investigation sampling, however in some areas, additional sampling would be necessary during the design to determine excavation limits.

- Following removal, documentation samples would be collected from the limits of the excavation areas and submitted for laboratory analysis. Site restoration would occur following the collection of these samples. Restoration would include placement of a minimum of one-foot of clean soil in all of the removal areas. Additional material would be placed, when necessary, to approximate pre-existing grades, followed by seeding/planting of disturbed soil areas.

- The details of the restoration program would be addressed by the remedial design. Restoration of the excavated pond/marsh/tributary areas would meet the substantive requirements of 6 NYCRR Part 663, Freshwater Wetlands Permit Requirements Regulations.

- A site management plan (SMP) would be developed and implemented. The SMP would identify the institutional controls and engineering controls (IC/ECs) required for the remedy and would detail their implementation. The SMP for this remedy would include:
(a) An IC/EC control plan to establish the controls and procedures necessary to; (i) manage residual contaminated soils that may be excavated from the site during future activities, including procedures for characterization, handling, health and safety of workers and the community as well as, disposal/reuse in accordance with applicable NYSDEC regulations and procedures, (ii) maintain use restrictions regarding site development or groundwater use identified in the environmental easement; and (iii) require the property owner to provide an IC/EC certification, as required by regulations, on a periodic basis; and (iv) a monitoring plan to monitor biota and groundwater at the site.

- Imposition of an institutional control in the 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 uses consistent with wetland and adjacent industrial use only; (c) restrict the use of groundwater within the vicinity of the Main Landfill as a source of potable water, without necessary water quality treatment as determined by NYSDOH; and (d) require the property owner to

complete and submit to the NYSDEC an annual certification.

TABLE 1
Nature and Extent of Contamination

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Marsh 1	PCB	0.68 to 330	1	15 of 16
Marsh 2		ND[d] to 65		19 of 22
Marsh 3		ND to 520		27 of 29
North Pond 2		ND to 24		3of 5
OU-1 Perimeter		ND to 20		4 of 10
Pump House		ND to 1.9		1 of 6
Cold Mill Landfill		ND to 3.52		2 of 13

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Marsh 1	PCB	ND to 134	10	5 of 16
Marsh 2		ND to 72		6 of 17
Marsh 3		ND to 52.68		7 of 23

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Marsh 1	PCB	ND to 380	1	30 of 39
Marsh 2		ND to 60		9 of 11
Marsh 3		0.6 to 1275		14 of 15
North Pond 1		ND to 94		42 of 47
North Pond 2		ND to 260		39 of 50
South Pond		ND to 161		8 of 14
Tributary 63		ND to 23.57		18 of 36

TABLE 1 (con't)
Nature and Extent of Contamination

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1-Dichloroethane	ND to 11.8	5	1 of 14
	Acetone	ND to 5.79	50	0 of 14
	Chloroethane	ND to 20.8	5	1 of 13
Semivolatile Organic Compounds (SVOCs)	1,2-Dichlorobenzene	ND to 3.11	3	1 of 13
	1,3-Dichlorobenzene	ND to 1.71	3	0 of 13
	1,4-Dichlorobenzene	ND to 3.53	3	2 of 13
	Bis(2-Ethylhexyl)phthalate	77.9 to 455	5	14 of 13
	Butylbenzylphthalate	ND to 1.65	50	0 of 13
	Di-n-butylphthalate	ND to 1.26	50	0 of 13
PCB/Pesticides	PCBs	ND to 0.083[d]	0.09	0 of 13
Inorganic Compounds	Barium	ND to 1730	1,000	1 of 13
	Iron	ND to 63,300	300	7 of 13
	Magnesium	ND to 68,000	35,000	6 of 13
	Manganese	ND to 27,500	300	10 of 13
	Sodium	ND to 300,000	20,000	9 of 13
	Zinc	ND to 22	2,000	0 of 13

[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

[b] SCG = standards, criteria, and guidance values;

[c] ND - Non-Detect: Not detected in the sample at the quantification limits of the analytical method used.

[d] Groundwater data in Table 1 includes only RI data. Historical maximum was 0.152 ppb (MW-5) in 1997 North Ponds Investigation Report.

TABLE 1 (con't)
Nature and Extent of Contamination

Biota Sampling for PCBs	Number of Samples	Concentration Range Detected (ppm)[a]
OU-3 (Location A)		
Redfin pickerel	6	ND to 0.94
Sunfish	3	ND
White sucker	1	ND
OU-3 (Location B)		
Brown bullhead (fillet)	2	0.60 to 1.11
Redfin pickerel	6	2.80 to 4.52
Sunfish	2	5.82 to 8.05
OU-3 (Location C)		
Largemouth bass (fillet)	1	ND
Redfin Pickerel	7	1.03 to 3.73
Sunfish	2	2.33 to 4.09

TABLE 1 (con't)

Nature and Extent of Contamination

Biota Sampling for PCBs	Number of Samples	Concentration Range Detected (ppm)[a]
Teal Marsh (Location 1A)		
Mudminnow	2	0.63 to 1.08
Teal Marsh (Location 1B)		
Sunfish	5	0.13 to 2.85
Redfin pickerel	5	0.11 to 1.34
Mudminnow	3	0.30 to 0.35
Teal Marsh (Location 2)		
Brown bullhead (fillet)	3	ND to 0.24
Sunfish (fillet)	1	0.77
Largemouth bass (fillet)	1	0.16
Redfin Pickerel	7	ND to 0.59
Sunfish	3	0.30 to 0.38

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
Alternative 1:No Action	$0	$8,500	$65,600
Alternative 2: Removal of Marsh Sediment (above 1 ppm), North Pond Sediment (1 foot depth), Soil and Installation of Soil Cover	$13,950,000	$13,500 (1-10 years) $5,000 (11-30 years)	$14,100,000
Alternative 3: Removal of Sediment (above 1 ppm), Soil (1 ppm/10 ppm) and Installation of Soil Cover	$17,350,000	$13,500 (1-10 years) $5,000 (11-30 years)	$17,500,000
Alternative 4: Removal of Sediment (above 0.2 ppm), Soil (1 ppm/10 ppm) and Installation of Soil Cover	$20,150,000	$8,500 (1-10 years)	$20,300,000