Appendix A
Operation and Maintenance Plan

Clothier Disposal Site
Granby, New York

March 1993

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Table of Contents

1.0 - Introduction

1.1 General

This document presents an Operation and Maintenance Plan for the remedy implemented at the Clothier Disposal Site (the Site) in Granby, New York (Figure 1). This Operation and Maintenance Plan has been prepared pursuant to the requirements of the Consent Decree between the United States and settling defendants (entered September 19, 1989).

In general, operation and maintenance associated with the remedy will consist of periodic inspections of the Site and maintenance, as-needed. Site operations are described in Section 2 of this plan. The components of the remedy for which maintenance may be required include the soil cover, erosion controls, silt fencing, ground-water monitoring wells, site security, and general Site conditions. Site maintenance is described in Section 3 of this plan.

In support of the operation and maintenance of the remedy, certain recordkeeping and reporting requirements will be conducted. Recordkeeping and reporting are described in Section 4 of this plan.

2.0 - Site Operation

2.1 General

Due to the nature of the remedy, operational requirements associated with the remedy at the Clothier Disposal Site are minimal. Specifically, the completed remedy consists of a soil cover and includes no active systems (i.e., pumps, piping) that require operational input. One operational aspect that is identified is routine inspection of the Site to assess the various components of the remedy and related site conditions.

2.2 Site Inspections

Site inspections will be conducted on a quarterly basis for the first year of operation, and semi-annually thereafter. Inspections will include a visual observation of the following:

- Soil cover;
- Erosion controls and silt fencing;
- Ground-water monitoring wells;
- Site security; and
- General Site conditions.

An Inspection Form (Attachment A) has been developed which will be used for each inspection. This form will be fully completed by the inspection personnel, and will identify any site deficiencies that may require maintenance as described in Section 3.

3.0 - Site Maintenance

3.1 General

Periodic maintenance of the remedy will be conducted based on noted observations during the quarterly or semi-annual inspections. In general, maintenance activities will be conducted in a fashion consistent with the Design Plan so as to maintain the integrity of the remedy with regard to the Performance Standards.

Outlined below are the specific site features that may require maintenance.

3.2 Soil Cover

Maintenance of the final soil cover will be conducted if the periodic inspection reveals notable deterioration of the soil cover through erosion, settlement, physical (man-made) disturbance, or other means. Maintenance, if required, will first consist of correcting, if possible, the cause of the soil cover deterioration. This could include, slope stabilization, additional erosion control, and/or subgrade compaction. Once these initial actions are completed, additional soil cover material will be placed and compacted in the affected area. Final restoration will consist of matching the existing grades (see Figure 2) and seeding of the restored area. Straw mulch will be placed over the newly seeded area, as required.

Fill materials used for soil cover maintenance will be obtained from an off-site source, and will be tested in a fashion consistent with the Design Plan. Additional soil volume may be obtained and stockpiled on-site (outside the area of one-foot soil cover) for future cover maintenance.

3.3 Erosion Controls and Silt Fencing

In parallel with maintenance of the soil cover, periodic maintenance of the erosion control features will be performed based on the periodic inspections. This may include, but is not limited to, localized restoration of silt fencing, vegetated areas, and traffic areas, as required.

Restoration of erosion controls will be conducted in a fashion consistent with the Design Plan including materials specifications and installation requirements.

3.4 Ground-Water Monitoring Wells

An external inspection of the existing ground-water monitoring wells (Figure 2) will be conducted during each periodic inspection. In addition, designated ground-water monitoring wells will be observed, accessed and sampled in conjunction with the Site Monitoring Plan. Should the assessment of the physical condition of the monitoring wells reveal that their use may be adversely impacted, appropriate maintenance actions will be conducted.

Maintenance of the ground-water monitoring wells shall include lubrication (with silicone lubricant) and exercising of the padlocks on each well during the periodic inspection. Should a lock be inoperable, it will be replaced with a keyed-alike lock.

Maintenance of the ground-water monitoring wells may also include repair or replacement of the protective casing and/or riser, should these items be damaged in some way (e.g., fallen trees, traffic accident, vandalism). Should repair or replacement be required, the monitoring well modifications will be conducted in a fashion consistent with the Design Plan using the same materials of the construction and construction

techniques. Further, if the elevation of the well casing changes due to modifications, the monitoring well will be resurveyed and the appropriate monitoring well log will be revised to reflect the change in elevation.

3.5 Site Security

The existing fencing and gate at the Site will be maintained as required to retain Site security. This will include a visual inspection of the perimeter fencing during each periodic inspection, and repair/replacement of broken fence sections. Further, the lock on the gate will be lubricated and exercised during each inspection.

3.6 General Site Conditions

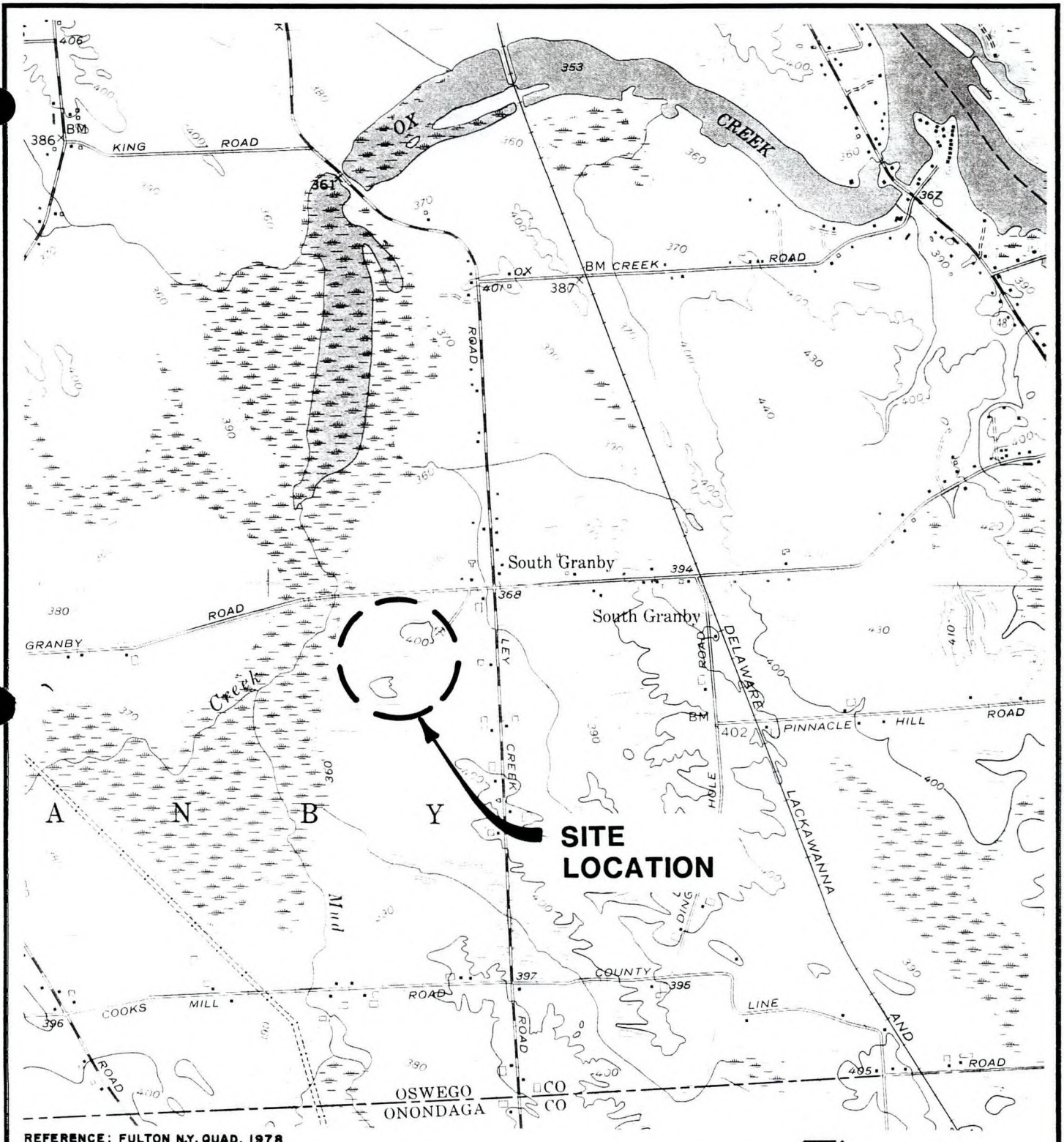
The overall Site conditions will be noted during each periodic inspection, and appropriate maintenance actions will be taken as required. This will include correction of certain miscellaneous housekeeping items such as general vandalism, fallen trees, unauthorized dumping by others, etc., to the extent that these items effect the performance of the remedy.

4.0 - Reporting/Recordkeeping

4.1 General

The periodic inspection reports will be prepared by the Settling Defendants' representative and provided with each annual report to USEPA.

FIGURES



REFERENCE: FULTON N.Y. QUAD. 1978
LYSANDER N.Y. QUAD. 1976

2000' 0 2000'

APPROX. SCALE: 1" = 2000'

QUADRANGLE LOCATION

FEB. 1993
100.28.07

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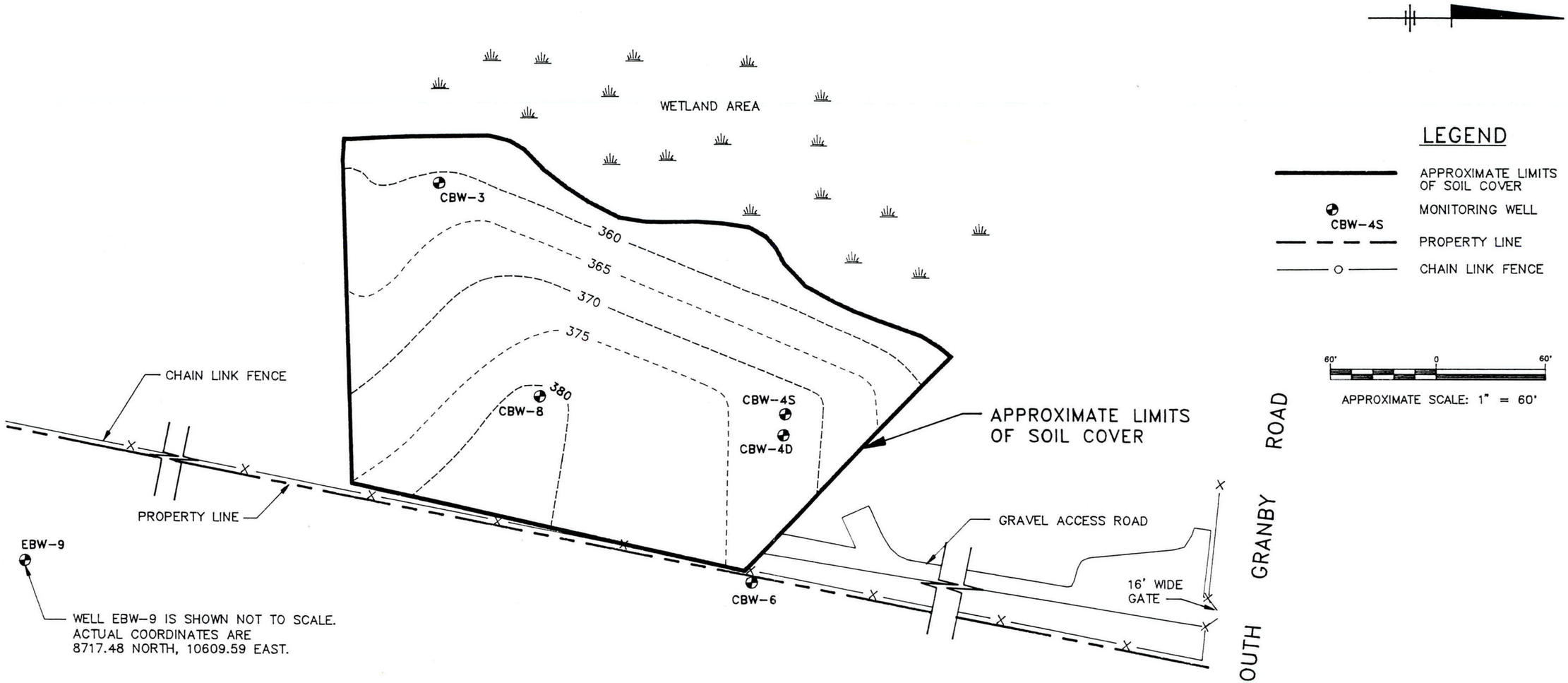
CLOTHIER DISPOSAL SITE
GRANBY, NEW YORK

OPERATIONS AND MAINTENANCE PLAN

LOCATION MAP

FIGURE 1



WELL EBW-9 IS SHOWN NOT TO SCALE.
ACTUAL COORDINATES ARE
8717.48 NORTH, 10609.59 EAST.

NOTE:

1. BASE MAP INFORMATION PROVIDED BY MODI ASSOCIATES.

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CLOTHIER DISPOSAL SITE
GRANBY, NEW YORK
OPERATION AND MAINTENANCE PLAN

SITE PLAN

FIGURE
2

2/93 54-AK
1002807R/10028002.DWG

ATTACHMENT A

PAS CLOTHIER SITE

ATTACHMENT A

POST-CLOSURE INSPECTION FORM

Inspection Date: _____

Inspectors: _____ _____

_____ _____

_____ _____

Time Arrived: _____ (AM/PM)

Time Departed: _____ (AM/PM)

Weather Conditions:

Rain _____

Snow _____

Temperature _____

Wind _____

Inspection Items	Site/Area Condition		Comments
	Satisfactory	Unsatisfactory	
A. Site Access and Security			
B. General Site Conditions			
C. Soil Cover			
• Bare Spots			
• Cracks			
• Erosion			
• Settlement			
• Water Ponding			
• Protruding Objects			
D. Silt Fence			
E. Ground-Water Monitoring Wells			
• Well CBW-3			
• Well CBW-4S			
• Well CBW-4D			
• Well CBW-6			
• Well CBW-8			
• Well EBW-9			

General Notes: _____

_____

Appendix B

Appendix B
Site Monitoring Plan

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1.0 - Introduction

1.1 General

This document presents the Site Monitoring Plan for the Clothier Disposal Site (the Site) in the Town of Granby, Oswego County, New York. The Site Monitoring Plan has been prepared as a component of the Remedial Design/Remedial Action (RD/RA) Report, in accordance with the Consent Decree (approved and entered in September 1989) between the United States Environmental Protection Agency (USEPA) and certain companies identified as potentially responsible parties (the "settling defendants").

The Consent Decree and December 1989 Record of Decision (ROD) require the implementation of a long-term monitoring program following completion of the remedial action at the Site. Specifically, the ROD lists the following components of the selected remedy:

- Performing long-term ground water, soil, and Ox Creek sediment and surface water monitoring to evaluate any changes should they occur. The long-term monitoring program will consider the installation of additional wells including bedrock wells. Based upon the results of the monitoring program, sampling of the residential wells in areas neighboring the site, and the deeper aquifer would be performed, if required.

- Performing post-construction air monitoring.

As discussed in the RD/RA Report, the remedial action at the Site was completed in late 1992, and the USEPA completed a final inspection of the Site on December 2, 1992. The USEPA issued a Notice to Proceed with the RD/RA Report on December 24, 1992.

1.2 Purpose and Scope of the Site Monitoring Plan

This Site Monitoring Plan is intended to serve as a comprehensive guide to the post-remedial monitoring at the Site. The purpose of the plan is to develop a long-term monitoring program which will provide a basis for comparison of monitoring results to allow a determination of whether changes have occurred. The long-term monitoring program provides for collection of data concerning constituents of concern at the Site; the results will be compared with data developed during previous investigations at the Site.

This document includes a summary of previous investigations performed at the Site, including observed constituent levels in ground water; Ox Creek surface water and sediment; air; and soil. The Long-Term Sampling and Analysis Plan (Section 3.0) presents the proposed sampling locations, analytical parameters, and sampling frequency for these media. Sampling and analytical procedures are presented in Sections 4.0 and 5.0, respectively, while a discussion of the data evaluation, including constituent concentrations to be used for comparison for each medium, is presented in Section 6.0.

2.0 - Summary of Previous Investigations

2.1 General

Several previous investigations have been performed at the Site, for the purpose of characterizing the concentrations of site-related constituents in various media. A summary of previous investigation results for each medium is presented in this section.

2.2 Ground Water

Ground-water sampling at the Site occurred from December 1985 to February 1986, and again in July 1986 by URS, Inc., a contractor for the New York State Department of Environmental Conservation (NYSDEC). The results from these two rounds of sampling were rejected by NYSDEC due to quality assurance issues. Since that time, two additional rounds of ground-water sampling have been collected by USEPA's contractor: in January 1988 by URS, Inc. and in December 1988 (as part of a "Post-RI/FS Evaluation of Ground Water and Wetlands") by Ebasco Services, Inc. (Ebasco).

Ground-water samples were taken from ten existing wells during the January 1988 sampling event. In December 1988, samples were collected from nine of the existing wells (well CBW-2S was not sampled because it was found to be damaged), and a new upgradient well designated EBW-9 (Figure 1). Based on the January 1988 sample results, USEPA concluded as part of the ROD that the number of several organic and inorganic constituents in ground water samples marginally exceeded a number of federal and New York State ground-water organic and inorganic applicable or relevant and appropriate requirements (ARARs). The ROD further stated that the January ground-water samples were noted as being turbid (which may have artificially inflated the level of contamination), and that the background wells were screened in different soil strata than those on-site. Based on these considerations, USEPA determined that the selected remedy

would not address ground water, and that the results from the subsequent (December 1988) sampling event would be used to determine whether a second operable unit to address ground water is needed.

In the December 1988 sampling event, Ebasco concluded that samples from two wells indicated volatile organic compounds were present at concentrations marginally above standards. Each well indicated the presence of only one compound. The occurrence of volatiles was limited to tetrachloroethene in well CBW-8 and trichloroethene in CBW-4S, leading Ebasco to conclude that volatile organic contamination was not widespread on-site. The subsequent December 1988 sampling results indicated lower concentrations of the volatiles than those found during the sampling event in January 1998. While inconclusive, Ebasco stated that the downward trend in ground water contaminant concentrations indicates that the system may be naturally flushing contaminants. In addition, several organic constituents detected in January 1988 at levels below the contract-required detection limit (CRDL) were not detected in December 1988.

Inorganic analyses of ground water indicated that antimony, barium, beryllium, chromium, lead, magnesium, and manganese exceeded New York State Ground-Water Standards. However, none of these elements were included as chemicals of concern in soils during the supplemental RI/FS conducted for the Site (Ebasco, 1988), as these inorganics were not detected above background levels. Furthermore, Ebasco suggested that the increase in inorganic concentrations is due to the turbidity of the samples collected from on-site wells.

As a result of the sampling and analysis of ground water during the December 1988 Post-RI/FS activities, Ebasco concluded that a significant threat to human health and the environment does not exist, and that remedial action is not warranted at this time. The Post-RI/FS concluded that the long-term monitoring of ground water, as called for in the ROD, will provide a means of monitoring the status of the medium.

2.3 Ox Creek Surface Water and Sediment

As part of the RI/FS for the Site, URS investigated Ox Creek and the adjoining wetlands surface water and sediment; however, data from this investigation were rejected due to quality assurance issues. In 1987, the United States Fish and Wildlife Services (USFWS) conducted an investigation into the effects of the Site on Ox Creek, including samples of surface water and sediment from five locations along Ox Creek (Figure 2). Sampling sites included two upstream locations, two downstream locations, and one location directly adjacent to the Site. Samples were collected from these five locations in July 1987; three additional samples were collected at one of the three locations again in September 1987. As part of the Post-RI/FS evaluation, Ebasco collected surface water and sediment samples from six locations in the wetland area surrounding Ox Creek in December 1988.

Although analyses of samples collected by USFWS detected a number of organic constituents in the surface water and sediment, the most prevalent were the common laboratory chemicals acetone and methylene chloride, both of which were also detected in nearly all of the sample blanks, suggesting that their presence was due to laboratory contamination. Other compounds detected include polychlorinated aromatic hydrocarbons (PAHs), which were attributed to natural occurrences or possible non-Site-related contamination by motor fuels or lubricating oils; N-nitrosodiphenylamine, which was acknowledged as possibly Site-related but is also a possible lab contaminant; 2-butanone which was recognized as a gasoline derivative and common waterway contaminant where motorboats are used; and several pesticides which were attributed to agricultural runoff.

Barium was the only inorganic constituent reported as a potential indicator of Site-related contamination. Barium concentrations were elevated in sediment collected adjacent to the Site, but at levels that were not considered hazardous to fish and wildlife resources.

Based on these data, as well as data on constituent concentrations in biota and qualitative habitat assessment results, the USFWS concluded that the Site was not releasing significant quantities of hazardous wastes into Ox Creek. Moreover, the USFWS did not believe that any off-site remediation was necessary on these areas beyond what was proposed in the ROD.

The results from the Post-RI/FS sampling of surface water from six locations in the wetlands adjacent to the Site indicate that, although three locations had organic compounds, none of the compounds (di-n-octylphthalate, 2-hexanone, and benzoic acid) were found in concentrations which exceeded New York State standards. Because the locations of these occurrences were relatively far from on-site activities, and these compounds were not present at sampling locations closer to possible on-site sources, it was suggested that these occurrences were not Site-related.

Inorganic analysis of surface water from the six locations sampled by Ebasco in the wetlands indicates the presence of several inorganic constituents. For most of these constituents, a location on the far western side of the wetland had the second highest concentration. However, the lack of elevated concentrations occurring at the location which is closest to possible on-site sources, and the highest identified concentrations occurring at the most distant sampling location (ES-6), suggested that the occurrence of elevated inorganics at ES-3 was not Site-related.

The results from the Post-RI/FS analyses of sediment from the six sampling locations in the wetlands indicated the presence of volatile organics: 2-butanone and toluene at four locations. Because two of the locations were relatively far from on-site activities, the occurrence of these compounds was probably not Site-related and their occurrence could be due to runoff from highways or agricultural operations.

Semi-volatile organic compounds present in sediment from the wetlands included benzoic acid and phenol. Because of their distribution in the wetland, and the possibility that these compounds are naturally occurring in animal excretion products or from decomposition of organic matter, these occurrences were probably not Site-related.

None of the inorganic chemicals of concern from on-site soils during the supplemental RI/FS (Ebasco, 1988) were found in the sediment from the wetlands.

The results and the analyses of the Post-RI/FS indicated that a significant threat to human health and the environment does not exist at this time and remedial actions of the wetlands are not warranted. The Post-RI/FS further concluded that the long-term monitoring of surface water and sediment as called for in the ROD, will provide a means of monitoring the status of these media.

In June 1992, three surface soil samples were collected by Blasland & Bouck at the locations of surface seeps near the wetland margin identified in May 1992 by NYSDEC. The results from that program indicated that PCBs were present at concentrations above the "clean closure" levels, but at concentrations similar to those detected previously in soil samples at the Site. Other organic and inorganic constituents were also found at levels similar to those detected in previous studies. Because the seep areas were to be included in the area requiring the soil cap as identified in the ROD, no modification to the remedial design was deemed necessary. The July 1992 Seep Investigation Report (Blasland & Bouck) concluded that the seeps were a naturally-occurring discharge to the wetland. Post-remedial monitoring of surface water and sediment near the seep locations will be incorporated in the Long-Term Sampling and Analysis Plan to provide data on any changes should they occur.

2.4 Air

Previous air monitoring at the Site was performed by USEPA prior to the removal of over 2,000 drums, using Draeger tubes. As a result of this monitoring, the USEPA estimated concentrations of benzene at greater than 10 ppm and toluene at greater than 100 ppm. Air monitoring after the drum removal activities consisted of Site perimeter (upwind and downwind) and worker breathing zone monitoring using a photoionization detector (PID) and aerosol monitor. The results of this effort indicated that background concentrations were not exceeded during construction.

The ROD states that because surface soils at the Site were not completely covered by vegetation, wind entrainment of dust particles was a potential pathway for inhalation. Upon completion of the remedy, contaminated soils were completely covered by clean soil, which will be fully vegetated with the 1993 growing season. Because inhalation is no longer a potential pathway for site contaminants, no further air monitoring is warranted.

2.5 Soil

The distribution of constituents in on-site soils was determined by soil samples during the RI/FS and Supplemental RI/FS; and was further refined during pre-design sampling. Shallow (0 to 2 feet and 3 to 5 feet) soil samples were collected by URS, Inc. in October 1987 (44 samples from 27 locations). Ebasco collected 25 soil samples at various depths (5 to 20 feet) from 9 additional soil borings in February 1988, to provide information on the vertical extent of constituents in soils. The locations of these soil samples are shown on Figure 3.

Based on the results of the soil sampling efforts, and the risk assessment performed by Ebasco as part of the Supplemental RI/FS, soil "cleanup levels to reduce risks" were determined. As reported in the ROD, the cleanup level for CPAHs was set at 0.33 ppm, while the cleanup level for PCBs was assumed to be 1.0 ppm. A comparison of the soil sample results to the cleanup level for CPAHs revealed five areas of the Site requiring remediation. A comparison of the soil sample results to the cleanup level for PCBs revealed two areas of the site where the cleanup level was exceeded. One of these areas was not targeted for remediation because the sample interval where the PCB cleanup level was exceeded was at a depth of 13 to 15 feet below ground surface. The areas determined to have contaminant concentrations in surface soil above the cleanup levels are shown on Figure 4.

As previously discussed, the remedy selected for the Site, as documented in the ROD, consisted of the placement of a one-foot soil cover over the areas of low-level residual soil contamination identified in the

Supplemental RI/FS. The USEPA has determined that risk levels associated with this residual contamination are minimal, and within the range considered acceptable in Superfund remedies. The selected remedy provides additional protection by reducing the principal remaining threat at the Site, namely, direct contact and ingestion of low-level contaminated soil, by covering the contaminated areas with one foot of clean soil. To further define the area requiring placement of the soil cover, Canonie Environmental Services, Corp. (Canonie), on behalf of the Settling Defendants, collected 20 surface soil samples in May 1990. Soil sample locations were placed in two concentric circles for this purpose. In July 1990, seven additional samples were collected to further define the soil cap area. As a result of the pre-design soil sampling, an area of approximately 1.3 acres was selected for soil cap placement (Figure 4).

As part of the implementation of the remedy, soil used in the soil cap was also analyzed and determined to be acceptable for use. Because the area identified in the supplemental RI/FS and ROD (and verified during the pre-design activities) as having residual soil contaminant concentrations above the cleanup levels has been covered with clean soil, no additional post-remedial soil sampling is warranted.

3.0 - Long-Term Sampling and Analysis Plan

3.1 General

In accordance with the Consent Decree, this portion of the Site Monitoring Plan sets forth the location and frequency of sampling for those media at the Site requiring long-term monitoring, as well as the analytical parameters to be used. The selection of media and parameters is based on the results of previous sampling conducted at the Site. The frequency and number of samples are based on seasonal considerations and allow for flexibility in future sampling events in response to the results of initial events.

3.2 Ground-Water Monitoring

3.2.1 Sampling Locations

The purpose of post-remedial ground-water monitoring is to detect changes in ground-water quality, should they occur, as a result of the remaining residually-contaminated soil left on-site beneath the soil cover. Based on the results of previous ground-water monitoring, the existing wells which are located in the vicinity of this area include the following:

- CBW-3
- CBW-4S
- CBW-4D
- CBW-8
- CBW-6

In addition, upgradient well EBW-9 will be included to provide baseline water quality data for comparison purposes.

The locations of the monitoring wells making up the proposed ground-water monitoring system are shown on Figure 1.

The ROD states that the long-term monitoring program for ground water would also consider the installation of additional wells, including bedrock wells, if necessary. Based on the results of the Post-RI/FS ground-water sampling (which was performed after ROD issuance), Ebasco concluded that a significant threat to human health and the environment does not exist at this time and remedial action for the ground water is not warranted. In view of Ebasco's post-ROD conclusion that Site-related ground-water contamination does not warrant remediation, as well as the lack of any conflicting data, the installation of additional wells to further characterize ground water quality at the Site is not necessary at the present time.

3.2.2 Analytical Parameters

The analytical parameters for ground-water samples are based on the contaminants previously detected above background levels in soils and ground water at the Site. Ground-water samples will initially be analyzed for Target Compound List (TCL) volatile organic compounds, TCL semivolatile organic compounds, TCL pesticides/PCBs, and Target Analyte List (TAL) metals. The volatiles and metals have been included because of their previous occurrence in ground-water samples at collected at the Site, and because previous data proved inconclusive as to the "site-relatedness" of these parameters with respect to their occurrence in soils. Although not previously detected in ground water at the site, semivolatile and pesticide/PCB parameters have been included because they include the contaminants of concern (CPAHs and PCBs) in soils which drove the remedial action at the Site. If specific analytical parameters are detected at concentrations above background in less than five percent of all ground-water samples collected, those parameters may be eliminated from the program.

3.2.3 Sampling Frequency

Ground-water samples will be collected from the six wells that make up the ground-water monitoring system semi-annually (spring and fall seasons) during the first year to provide an initial baseline and annually (spring season) thereafter. The program may continue for five years; during this period a decision will be made whether to continue the program as is, expand it to include additional wells (such as new bedrock wells or existing residential wells), or discontinue the program. The evaluation of ground-water quality data leading to this decision is discussed in Section 6.

3.3 Ox Creek Surface Water and Sediment Monitoring

3.3.1 Sampling Locations

Based on the results from previous surface water and sediment sampling conducted by USFWS and Ebasco, as well as a Seep Investigation Program conducted by Blasland & Bouck, a limited monitoring program has been developed for these media as part of the long-term sampling and analysis plan. The purpose of this program will be to provide a means of monitoring the status of these media to confirm that additional investigation and/or remediation are not necessary.

The Ox Creek surface water and sediment monitoring program will consist of four locations (two in Ox Creek and two in the wetland area between the site and Ox Creek). The selected locations are shown on Figure 2.

3.3.2 Analytical Parameters

The analytical parameters for surface water and sediment samples are based on the constituents previously detected in liquid seeps present at the Site. Analytical parameters detected in surface water and sediments

during USFWS and Ebasco investigations were determined not to be site related. Surface water and sediment samples will initially be sampled for TCL volatiles, semi-volatiles, pesticides/PCBs, and TAL metals. If specific analytical parameters are detected at concentrations above detection levels or background levels (naturally occurring or otherwise not site-related) in less than five percent of the samples, those parameters may be eliminated (see Section 6).

3.3.3 Sampling Frequency

Surface water and sediment samples will be collected semi-annually (spring and fall seasons) during the first year to provide an initial baseline and annually (spring season) thereafter. The program may continue for five years; during this period a decision will be made whether to continue the program as is, expand the program to include additional locations, or discontinue the program. The evaluation of sediment and surface water data which will be performed in support of this decision is discussed in Section 6.

4.1 General

The procedures for sample collection, chain-of-custody control, and preservation/shipment for air and soil at the Site are described below. The following subsections describe general procedures and techniques for measurement of water levels, purging of wells, field measurements, etc. Detailed protocols for sample collection are presented in Attachment A. Laboratory analytical procedures are discussed in Section 5.0.

4.2 Procedures Prior to Sampling

General procedures followed prior to sample collection at each sampling point are as follows:

1. Locate the sampling point.
2. Observe and record the condition of the sampling point and its surrounding area on the Field Information Form (see Attachment B). Information to be noted includes:

    - The condition of monitoring point's identification sign;
    - Recent disturbance in vicinity of sampling point;
    - Condition of the security system for sampling point;
    - Well integrity including condition of any cement footing or protective casing. In addition, note physical surroundings, obstructions, or kinks in well casing, water in annular space, etc.;
    - Weather conditions (i.e., wind direction when sampling for volatiles and note if sampling was performed downwind of an active area); and

- Evidence of contamination.

Prior to ground-water well purging and sampling, an accurate water level measurement will be taken with a portable, conventional electric slope water level indicator or fiberglass tape that is rinsed with deionized water before each use. The water level measurement will be recorded on the Field Information Form (see Attachment B).

4.3 Sample Collection

4.3.1 Ground-Water Samples

The equivalent of three standing water volumes, measured from the depth of water to base of the well, will be evacuated from each well prior to sampling to assure that samples are drawn from the formation, not from stagnant water left in the well between sampling events. If the well does not yield three volumes, it will be pumped dry and allowed to recharge overnight. If a monitoring well does not recharge within a reasonable time period (24 hours), the well will be considered dry for the sampling event.

Specific conductance, pH, and ground-water temperature measurements will be taken in the field subsequent to well evacuation. Procedures provided with the instruments will be used for calibration and testing. All results will be recorded on the Field Information Form (Attachment B) noting units to three significant figures. A detailed sample collection protocol is included in Attachment A.

4.3.2 Ox Creek Surface Water and Sediment Samples

Surface water and sediment samples will be obtained as grab samples from the locations noted on Figure 2. Subsurface water samples will be obtained from near the water surface.

Sediment samples will be collected from the top six inches at each location using a trowel. Detailed surface water and sediment sample collection protocols are included in Attachment A.

4.5 Sample Preservation and Shipment

Since multiple analyses will be required for various media, different types of containers and preservatives may be necessary. In these situations, multiple pre-labeled containers will be supplied by the laboratory for each sampling point. The appropriate preservatives will be attached to a bottle in small vials or will have been added to each container (as required) during sample bottle preparation by the analytical laboratory, with the exception of TOX bottles (the acid preservative is added to the TOX bottle after the sample is collected). The volume requirements, containers, preservatives, and holding times to be added for each sample analysis are listed in Table 3.

The appropriate sample bottles that have been prepared in the laboratory with the appropriate preservative will be used to collect samples from each location. Containers for collecting samples for volatile organics analysis will be filled to slightly more than full before the septum and cap are placed on the container to ensure that it is free of head space (sampling personnel will check for air bubbles by inverting the container and tapping it). Routine sample collections will include sets of field blanks and trip blanks.

Immediately after collection, bottles will be placed in insulated shuttles or coolers with ice packs and sealed. Samples will then be sent to Galson Laboratories or another USEPA-acceptable laboratory. Executed Field Information Forms (Attachment B) and Chain-of-Custody Forms (Attachment C) will be placed inside the sample shipping containers.

4.6 Chain-of-Custody

At the time each sample is taken, a Chain-of-Custody Form (Attachment C) will be completed by the sampler and placed in the sample chest. Upon transfer of sample possession to subsequent custodians, the Chain-of-Custody Form will be signed by the person taking custody of the sample container. Upon receipt of samples at the laboratory, the shipping container seal will be broken and the condition of samples, including temperature, will be recorded by the receiver. The Chain-of-Custody Forms will be included in the analytical report prepared by the laboratory and will be considered an integral part of that report.

As part of the chain-of-custody procedure, each sample container will be labeled with the sample number and the parameter to be sampled.

All sampling procedures, measurements, and observations will be recorded on the Chain-of-Custody Forms, including the following information:

- Site name, sample point identification number, and other pertinent identifiers;
- Depth to ground water, surface water elevation, sediment depth, etc. (as appropriate);
- Information regarding purging the well prior to sampling (if appropriate);
- Date and elapsed time from sample start to sample finish (if elapsed hours are greater than one);
- Sample method (dedicated bailer, grab, composite, etc.);
- Field test results including pH, temperature, and specific conductance;
- Type of sample;
- Field observations (e.g. well, spillway condition);
- Appearance of sample (i.e., color, turbidity, sediment or oil on surface); and
- Sampler's identity and signature.

Upon receipt of the samples at the laboratory, the date and time of arrival will be noted on the Chain-of-Custody Forms. The laboratory receiver will verify that the seal is intact and custody has not been broken, and make note of sample bottle condition on the forms. These forms will be retained by the laboratory and returned with the results of the analysis.

5.0 - Analytical Procedures

5.1 General

This section of the Site Monitoring Plan presents the proposed analytical procedures to be followed for analysis of ground water, surface water and sediment samples from the site. Laboratory analytical methodologies and data tracking, validation and reporting are discussed below.

5.2 Analytical Methods

The laboratory will follow the procedures and methods, Quality Assurance/Quality Control (QA/QC) and documentation specified in the Superfund Contract Laboratory Program (CLP) for samples analyzed for the TCL and TAL compounds.

The main objective of the QA/QC requirements is to assure the production of quality data which will support the long-term sampling and analysis program. There are two categories of QA/QC outlined in the analytical methods: 1) instrument or system performance QA/QC; and 2) sample or method performance QA/QC.

System performance assures that the equipment is operating correctly and thus that one possible source of error is under control. A number of items are required: Instrument calibration, calibration verifications and blanks, check samples, range analysis and detection limit determination.

Method performance assures the analysis is within specified control limits established by CLP protocols and is evaluated through specific parameters used to assess the validity of the sample analysis which include:

- Method Blank - Provides a means of assessing the existence and magnitude of contamination introduced during analysis and to assure that contaminants are not related in data results;

- Trip Blank - Assesses contamination during bottle preparation and lab contamination introduced during the analysis;

- Matrix Spike - The analyte of interest is added to a sample prior to preparation at every level of concentration and with every sample matrix within a case of samples. Matrix spikes (MS) are used to assess the effect of the sample matrix on the analytical method. The compounds used as spikes must provide a percent recovery that is within the established limits (accuracy). Additionally, the result obtained for each of the Matrix Spike Duplicates (MSD) must agree within the required relative percent difference (RPD) limits (precision). MS/MSD will be analyzed at a frequency of 5%, or one per 20 samples per matrix, or one pair per two week period;

- Duplicates - Duplicate sample analysis is performed for each matrix and concentration level in a case of samples. The results of the duplicate analyses serve as an indicator of the precision of the method and the sample results; and

- Surrogate Standards - An organic compound similar in chemical composition to analytes of interest is spiked into samples to provide accuracy and precision information to monitor sample preparation and analysis.

5.3 Data Tracking, Validation and Reporting

Samples will be tracked during the sampling phase, laboratory analysis, and data validation program. Sample tracking will begin at the laboratory prior to sampling, when bottles are prepared and shipped. During sampling, this task will involve ensuring that the proper documentation, chain-of-custody, and sample

transport to the laboratory are performed (see Section 4.0 - Sampling Procedures). The laboratory will document extraction and analysis dates for tracking purposes.

Full CLP packages will be required for samples analyzed for the TCL/TAL. Full CLP packages will be validated as outlined below.

Data validation is the assessment of data quality with respect to method requirements and technical performance. Analytical data packages are examined to ensure that all lab components are included, all QC requirements are performed and data use restrictions are well defined. Data reduction, validation, and reporting for samples analyzed by the laboratory will be performed in accordance with the specifications in the "Laboratory Data Validation Functional Guidelines," "CLP Organics Data Review and Preliminary Review" (USEPA 1992a), and the SOP HW-2 "Evaluation of Metals Data for the CLP" (USEPA 1992a), for format and content reference. The most current version of these documents will be used for validation purposes.

The validated data will be reduced and tabulated electronically. The tabulated format will be suitable for inclusion in the Remedial Action Program report. The data tabulations will be sorted by classes of constituents (e.g., volatile organics, inorganics). Each individual table will contain the following information: sample identification; analytical parameters; detection limits; and concentrations detected and qualifers as appropriate. A complete copy of the data package, data validation report, and data usability report will be contained in the Site Monitoring Plan report as a separate Appendix. The Remedial Action Program report will be prepared following each sampling event in accordance with the requirements of the Consent Decree.

6.1 General

This section presents a discussion of the procedures for evaluation of the analytical results from the long-term sampling and analysis program and the steps to be followed in the event that the results indicate that changes have occurred. For each medium to be sampled, the comparative levels for evaluation of the results (background concentrations, previous analytical data, and/or ARARs) are presented, and "screening levels" are proposed which, if exceeded, would potentially trigger contingency monitoring.

6.2 Ground Water

6.2.1 Comparative Levels for Evaluation of Results

The analytical parameters to initially be used for comparison of ground-water monitoring results consist of those which have been previously detected in ground water and/or are suspected to be site related (as a result of their previous detection in soils at levels above background). Table 1 presents a summary of these parameters, with the historical ground-water concentrations based on previous sampling at the Site. As described in Section 3.2.2, if specific analytical parameters are detected at concentrations above background in less than five percent of all ground-water samples collected, those parameters may be eliminated from the program.

6.2.2 Screening Levels and Contingency Monitoring

The results from each ground-water sampling event will be compared to analytical results from previous ground-water sampling, upgradient concentrations, and New York State Ground-Water Standards, where applicable. For each analytical parameter, the higher of these values will serve as the "screening level".

The exceedance of a screening level during a round of post-remedial ground-water monitoring would potentially trigger contingency monitoring.

Contingency monitoring will take place as soon as practical following the receipt of results which indicate exceedance of a screening level. The contingency monitoring effort will consist of resampling the well(s) from which the sample exhibiting the exceedance was collected, as well as the upgradient well (EBW-9). If the exceedance is shown to be an anomaly, the screening level will be withdrawn and routine monitoring will continue in accordance with the long-term sampling and analysis program. If the exceedance is confirmed, the situation will be discussed with USEPA to determine the appropriate course of additional investigation for the specific environmental conditions. As provided in the ROD, such additional investigation may include the installation of additional wells (possibly including bedrock wells or the sampling of residential wells in the area).

6.3 Ox Creek Surface Water and Sediment

6.3.1 Comparative Levels for Evaluation of Results

Previous sampling of surface water and sediment by USEPA and Ebasco revealed the presence of some organic and inorganic constituents. Most of the analytical results from surface water and sediment samples did not exceed applicable standards, guidelines, or background concentrations used for comparison. Those concentrations which did exceed standards, guidelines, or background were attributed to natural causes or other on-site activities, and/or were found in samples collected from locations which suggest that the presence of the constituents is not site-related.

Based on the lack of site-related contaminants previously detected in surface water and sediment, the analytical parameters to be used for comparison of results from the long-term sampling and analysis program are those which are suspected to be site-related due to their previous detection in liquid seeps

present at the Site. The liquid seeps may serve as a potential continuing source of the detected parameters in the wetland. A list of their parameters with corresponding concentrations is presented in Table 2.

6.3.2 Screening Levels and Contingency Monitoring

The results from each surface water and sediment sampling event will be compared to the previously detected values of the liquid seeps. For each analytical parameter, the previously identified value will serve as the screening level. The exceedance of a screening level during a round of post-remedial sediment/surface water monitoring would trigger contingency monitoring.

Contingency monitoring will take place as soon as practical following the receipt of results which indicate exceedance of a screening level. The contingency monitoring effort will consist of collecting another sample from the location exhibiting the exceedance, as well as the background location. If the exceedance is shown to be anomalous, the screening level will be withdrawn and routine monitoring will continue in accordance with the long-term sampling and analysis program. If the exceedance is confirmed, the situation will be discussed with USEPA to determine the appropriate course, if any, of additional investigation for the specific environmental conditions.