PROPOSED REMEDIAL ACTION PLAN
FORMER NIAGARA MOTORS SITE

Environmental Restoration Project
City of Dunkirk, Chautauqua County, New York
Site No. E907025

January 2010

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

A 1996 Clean Water/Clean Air Bond Act
Environmental Restoration Project

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYS DOH), is proposing a remedy for the Former Niagara Motors Site (the Site). The presence of hazardous substances has created threats to human health and/or the environment that are addressed by this proposed remedy.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration Program, the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated, the property can then be reused.

As more fully described in Sections 3 and 5 of this document, the site has been utilized for industrial purposes (metal part manufacturing) from at least 1919 to the 1970s which has resulted in the disposal of hazardous substances, including inorganic compounds, i.e., metals, and semi-volatile organic compounds. These hazardous substances have contaminated the surface and subsurface soil at the site, and have resulted in:

- a threat to human health associated with current and potential exposure to inorganic compounds (i.e., metals) and semi volatile organic compounds; and

- an environmental threat associated with the current and potential impacts of contaminants to groundwater.

To eliminate or mitigate these threats, the Department proposes excavation and off-site disposal of soils that have been highly impacted by contamination. Finally, a cover system would be placed on areas that do not meet commercial soil cleanup objectives.

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

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

The Department has issued this PRAP as a component of the Citizen Participation Plan (CP 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 April 2008 Draft Remedial Investigation/Alternatives Analysis (RI/AA) Report, and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

City of Dunkirk
Department of Development
City Hall
342 Central Avenue
Dunkirk, New York 14048
Mr. Kory Ahlstrom
(716) 366-9876
By appointment only

New York State Department of Environmental Conservation
Region 9 Office – Buffalo
270 Michigan Avenue
Buffalo, New York 14203
(716) 851-7220
By appointment only

The list below identifies names, addresses and phone numbers of contact people familiar with the project who can answer questions and address public concerns about the site:

Mr. William P. Murray, P.E.
Project Manager
NYSDEC Region 9 Office
270 Michigan Avenue
Buffalo, NY 14203
(716) 851-7220

Mr. Cameron O'Connor
Public Health Specialist
NY State Dept. of Health
584 Delaware Avenue
Buffalo, NY 14202
(716) 847-4385

Mr. Kory Ahlstrom
Director
Department of Development
342 Central Avenue
City of Dunkirk
Dunkirk, NY
(716) 366-9876

The Department seeks input from the community on all PRAPs. A public comment period has been set from {dates} to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for {date} at the {location} beginning at {time}.

At the meeting, the results of the SI/RAR will be presented along with a summary of the proposed remedy. 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. William P. Murray, P.E., Project Manager at the above address through {date comment period ends}.

The Department may modify the proposed remedy 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 Department's final selection of the remedy for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The site consists of approximately 2.01 acres of land located to the northwest of the intersection of New York State (NYS) Route 60 and Ice Cream Drive in Dunkirk, New York. Figure 1 shows the location of the site. The site address has been historically referenced as 760 Lamphere Street. Figure 2 is included as a site Plan and shows the property boundaries and former building locations. Portions of concrete foundations are evident near the ground surfaces. No aboveground structures, other than power poles, are currently present on the site. A series of railroad tracks adjoin the site on the north and west sides. Ice Cream Drive and NYS Route 60 adjoin the site on the south and east sides, respectively.

Soil/fill overlies the native soil across the site. A thin layer of soil/fill material with a thickness of one foot or less is present as the uppermost overburden layer throughout the site. This material primarily consists of clayey-silt and fine sand that contained a varying quantity of metal shavings and metal parts. Underlying the soil/fill material is a gray and brown clayey-silt with varying quantities of sand and gravel to an average depth of four feet below grade.

The site is located approximately one mile south of Lake Erie. The nearest surface water body is Crooked Brook, which is located approximately 3,000 feet southwest of the site. Storm water runoff drains in the north and southwest directions across the surface of the site towards the following two areas: a drainage ditch along the northern boundary of the site; and a low-lying area on the southwest portion of the site.

Groundwater is present in the native material, ranging from approximately three to six feet below the existing ground surface. The shallow groundwater flow direction is generally to the north.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The site has been used for various industrial purposes from at least 1919 through the 1970s. Operations ceased in the 1970s and the on-site industrial building was abandoned approximately 10 years later. As a result, the building fell into disrepair and was demolished in the year 2000. The site has been vacant since that time. The City obtained temporary incidents of ownership of the site for the sole purpose of entering the site and conducting an environmental investigation.

3.2: Remedial History

On August 4, 1999, the NYSDEC and Chautauqua County Health Department representatives observed approximately thirty drums on the site during a routine inspection. The drums contained what appeared to be a liquid petroleum material. In addition, evidence of spills was observed on the ground and on the floor surface within the on-site building. As a result, the site was assigned Spill Number 9975340. After several unsuccessful attempts to have the owner remove the drums and remediate soil impacts, NYSDEC completed a sampling/analysis program that focused on the contamination present on the floor inside of the building. The results from this sampling/analysis program identified the waste material on the floor as lubricating oil.

The NYSDEC inspected the site on September 6, 2000. At this time, the building had been demolished by the responsible party and the drums removed from the site. The site was ultimately referred to the New York State Attorney General's Office for cost recovery. NYSDEC completed another site visit during the spring of 2003, at which time no oil stains were observed on the surface soils, no sheens or stressed vegetation were observed.

SECTION 4: ENFORCEMENT STATUS

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

The New York State Office of the Attorney General is currently seeking cost recovery for cleanup and removal costs incurred by the New York Environmental Protection and Spill Compensation Fund in connection with Spill No. 99-75340. The PRPs for the site, documented to date, include: Mr. William Narraway.

The City of Dunkirk will assist the state in their efforts by providing all information to the state which identifies PRPs. The City of Dunkirk will also not enter into any agreement regarding response costs without the approval of the Department.

SECTION 5: SITE CONTAMINATION

The City of Dunkirk has recently completed a site investigation/remedial alternatives report (SI/RAR) to determine the nature and extent of any contamination by hazardous substances at this environmental restoration site.

5.1: Summary of the Site Investigation

The purpose of the SI was to define the nature and extent of any contamination resulting from previous activities at the site. The SI was conducted between September 2005 and October 2007. The field activities and findings of the investigation are described in the SI report.

- Completion of a boundary survey of the project site to establish the boundaries of the project site. The surveying work also included developing a base map and locating the horizontal and vertical positions (where appropriate) of sample locations and relevant site features.
- Collection and analysis of off-site background surface soil samples to create a database of background concentrations with which the on-site analytical testing results can be compared. Results for off-site background samples collected during the investigation of the nearby Roblin Steel site in Dunkirk were also incorporated into this report for use in determining background concentrations.
- Collection and analysis of on-site surface soil/fill samples to classify and characterize the surface soil/fill.
- Completion of a geophysical survey to identify magnetic anomalies that could indicate the presence of buried drums or tanks.
- Completion of test pits to identify the cause of magnetic anomalies and to enable the classification, screening, sampling and chemical characterization of subsurface soil.
- Completion of test borings to characterize subsurface soil conditions and facilitate the installation of groundwater monitoring wells.
- Installation, development and sampling of monitoring wells to enable the determination of groundwater flow direction and gradient, as well as the collection and chemical analysis of groundwater samples.
- Evaluation of the resulting data and preparation of a report

5.1.1: Standards, Criteria, and Guidance (SCGs)

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

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the New York State Regulations 6 NYCRR Part 375 Soil Cleanup Objectives.

- Background soil samples were taken from two locations. These locations were north and east of the site, and were unaffected by historic or current site operations. The samples were analyzed for Resource Conservation and Recovery Act (RCRA) inorganic compounds, polychlorinated biphenyls (PCBs) and Target Compound List (TCL) semi volatile organic compounds. The results of the background sample analysis were compared to relevant SI data to determine appropriate site remediation goals.

Based on the SI 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 in Section 5.1.2. More complete information can be found in the SI report.

5.1.2: Nature and Extent of Contamination

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

As described in the SI report, many soil and groundwater samples were collected to characterize the nature and extent of contamination. As seen in Figures 2 and 3, the main categories of contaminants that exceed their SCGs are semivolatile organic compounds (SVOCs) and inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) or micrograms per liter (ug/L) for water. In addition, chemical concentrations for soil are reported in either parts per million (ppm) or milligrams per kilogram (mg/Kg), or parts per billion (ppb) or micrograms per kilogram (ug/Kg).

Figures 2 and 3 summarize the degree of contamination for the contaminants of concern in soil and compare 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 background soil samples were used as part of the site remedial investigation. The background samples were analyzed for TCL SVOCs, PCBs and RCRA metals to characterize background levels in the vicinity of the project site and facilitate the evaluation of the analytical results generated from on-site sampling (see Table 1). A comparison of the results from these four samples indicates that they are generally similar. One or more SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs) were detected in each of the background samples. PAHs are formed through anthropogenic combustion processes such as the burning of coal, oil and gasoline. They are generally ubiquitous in soils in urban settings. One of the background samples exceeded the commercial use SCO for one SVOC. Additionally, several SVOCs, arsenic and lead exceeded unrestricted use SCOs. PCBs were not detected in the background samples. The site background concentration for each of the metals was generally within or below the published background concentration ranges for each analyte.

The surface soil observed during the field investigations generally consisted of soil material with varying amounts of fill material and metal shavings. Five surface soil samples were collected in October 2005 from the project site and analyzed for TCL SVOCs, PCBs, and RCRA metals. No PCBs were detected in these samples and therefore these analytes will not be discussed below. Additional surface soil samples were collected in October 2007 and included nineteen samples (twelve on-site and seven off-site) that were analyzed for RCRA metals and ten samples (six on-site and four off-site) that were analyzed for TCL SVOCs. Figure 2 depicts both on-site and off-site surface soil sample locations and surface areas that exceed commercial use cleanup objectives.

One or more SVOCs, primarily PAHs, were detected in each of the eleven surface soil samples collected from the project site. Contraventions of the commercial use SCOs occurred in six of the eleven samples; however, only one sample (SS-5) contained concentrations significantly above the commercial use SCOs. Of the five samples with SVOC concentrations below the commercial use SCOs, only one sample (SS-2) contained concentrations that were above the unrestricted use SCOs.

Five of the eight RCRA metals were detected at concentrations that exceed the commercial use SCOs in at least one surface soil sample and seven of the eight RCRA metals were detected at concentrations above the unrestricted SCG in at least one sample. The results indicate that the primary contaminants of concern are arsenic and lead. A comparison of the results for samples collected at the surface and those collected at depth at locations TP-6, TP-13, and TP-14, the significantly elevated metals concentrations are present at or very near the ground surface while the concentrations significantly decrease just one to two feet below grade.

Surface soil contamination identified during the SI/RAR will be addressed in the remedy selection process.

Subsurface Soil

The subsurface soil was characterized during the excavation of test pits and drilling of test borings. A total of 15 test pits and 10 test borings were completed during October 2005. Five subsurface soil samples were collected from the test pits in 2005 to characterize the subsurface soil/fill material. The subsurface samples collected during this event were analyzed for TCL VOCs, SVOCs, and PCBs and RCRA metals. No PCBs were detected in the samples. An additional eleven test pits were completed in October 2007. From these test pits, nine subsurface soil samples were analyzed for RCRA metals and nine other samples were analyzed for TCL SVOCs. The analytical results for the VOC, SVOCs, and metals results are summarized in Figure 3.

At least one VOC was detected in each of the five subsurface soil samples. These compounds were detected at very low concentrations, well below the SCOs for unrestricted use.

Because the most elevated concentrations of SVOCs were detected in surface soil sample SS-5, test pits TP-7 through TP-12 were completed in and around that sampling location to evaluate the vertical extent of contamination. As the field observations and analytical results demonstrate, the SVOC contamination at this location was restricted to the approximately six inches of soil lying on top of the building slab.

Test pits TP-15 and TP-16 were completed just off the building slab to evaluate the potential presence of contaminants related to previous reports of drum storage behind the former building. Field observations of soil/fill in TP-15 indicate that impacts may extend to approximately four feet below grade. The underlying native material at four feet below grade did not contain evidence of impacts. The estimated area of impacted soil is identified as Area B on Figure 4. The analytical results for TP-16 show that SVOC contamination is restricted to the surface soil, and that the underlying soil below one foot below grade does not contain any SVOCs above the unrestricted or commercial use SCOs.

Nuisance characteristics including stained soils and petroleum odors along with high TOV readings were identified in a number of subsurface soil investigation locations in the vicinity of the former 300-gallon underground storage tank (UST). The UST was encountered in test pit TP-M, which demonstrated nuisance characteristics, as did other proximal test pits including TP-F, TP-G, TP-H, TP-I, and TP-J.

A soil sample was collected from test pit TP-F at the interval with the highest PID measurements, 8 feet below grade. This sample contained only two SVOCs, which were present at very low concentrations, and tentatively identified compounds (TICs) at significantly higher concentrations. The presence of TICs along with the nuisance characteristics indicates that significant degradation of any petroleum in the area has occurred. This area of sampling locations with nuisance characteristics is identified as Area A on Figure 4.

The petroleum impacted soil in the vicinity of the 9,000-gallon UST was removed and properly disposed at the Chautauqua County Landfill during the implementation of the IRMs.

Backfill along a pipe at two feet below grade was found to contain elevated metals concentrations (lead – 86,000 ppm, arsenic 579 ppm), as shown by the results for TP-13 collected from approximately 2 feet below grade. The underlying material at 4.5 feet below grade did not contain elevated concentrations. This area is labeled as Area C on Figure 4. Because this lead concentration was the highest detected on the site, the toxicity characteristic leaching procedure (TCLP) was performed on the sample collected from approximately 2 feet below grade at TP-13 and was analyzed for lead to determine if this area contains characteristic hazardous waste. The TCLP lead concentration was 56.1 mg/L, over the applicable SCO of 5 mg/L.

Subsurface soil contamination identified during the SI/RAR will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from the four monitoring wells and analyzed for TCL VOCs, SVOCs, PCBs, and RCRA metals. Figure 2 shows the well locations. Although one VOC, VOC TICs and five metals were detected in the groundwater samples, all the detected concentrations were below the applicable SCGs. No SVOCs or PCBs were detected in the groundwater samples.

No site-related groundwater contamination of concern was identified during the SI/RAR. Therefore, no remedial alternatives need to be evaluated for groundwater.

5.2: <u>Interim Remedial Measures</u>

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 SI/RAR.

During the test pit activities, two USTs were encountered. A 9,000 UST was encountered and removed during the excavation of test pit TP-D. The tank was in relatively good condition. An approximately three-inch pipe on top of and parallel with the long dimension of the UST was also encountered. This piping also appeared to be in good condition. The majority of the soil in the vicinity of the UST was not stained and did not exhibit elevated PID measurements, petroleum odors or staining. However, a small amount of petroleum impacted soil was removed.

A second, smaller tank was encountered and removed during the excavation of test pit TP-M. This UST has an approximate capacity of 300 gallons, and was in fair condition. The UST contained water which exhibited petroleum odors and a sheen. The soil in the vicinity of the UST exhibited elevated PID measurements (up to 31 ppm), petroleum odors and staining. Due to the area's relatively large size and correspondingly large volume of impacted soil, the soils were not removed as part of the IRM.

5.3: <u>Summary of Human Exposure Pathways</u>:

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 Remedial Investigation/Alternatives Analysis Report which can be accessed at the document repository identified in Section 1 of this document. 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.

Under current and future use scenarios, there exists the potential for exposure to semi-volatile organic compounds and metals via inhalation, incidental ingestion or dermal contact with the on-site contaminated surface and subsurface soil.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of 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 following potential environmental concerns were identified in connection with the subject site: (1) the previously documented presence of petroleum-impacted surface soils and floor surfaces on the subject site, (2) contamination resulting from leaks and/or spill of solvents, chemicals, wastes and petroleum products, and (3) the presence of underground storage tanks (UST) and (4) metals contamination in the shallow soil.

Two USTs were removed as an IRM in 2006; a 9,000 gallon UST and 300 gallon UST. Sampling determined that approximately 2000 tons of impacted soil will require remediation due to leakage.

Soil onsite has been impacted requiring remediation. Approximately 400 tons of soil have been impacted by SVOCs and metals (arsenic and lead).

Groundwater impacts are considered minimal.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS AND PROPOSED USE OF THE SITE

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous substances 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 inorganic compounds (metals) and semi-volatile organic compounds in soil;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from surface soil and subsurface soil into surface water and ambient air through storm water erosion and wind borne dust.

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. Potential remedial alternatives for the Former Niagara Motors Site were identified, screened and evaluated in the RA report which is available at the document repositories established for the site.

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

7.1: Description of Remedial Alternatives

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

Alternatives B, C and D below would require the development and implementation of a Site Management Plan (SMP). Required elements of the SMP include an Environmental Easement (EE), a periodic certification statement, an Excavation Work Plan (EWP), a Health and Safety Plan (HASP) including a Community Air Monitoring Plan (CAMP). In addition, Alternative C and D would require an Operation and Maintenance (O&M) Plan to inspect, repair and maintain the cover system.

Alternative A: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an un-remediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Present Worth: *$0*
Capital Cost: *$0*
Annual Costs: *$0*

Alternative B: Removal of All Contaminated Soil/Fill Above Commercial SCOs

Present Worth: *$940,000*
Capital Cost: *$940,000*
Annual Costs: *$0*

This alternative is the most comprehensive, involving the removal and off-site disposal of all soil/fill that exceeds commercial use soil cleanup objectives from the site. Following the excavation and off-site disposal of contaminated surface and subsurface material, clean fill would be brought on-site and used for backfilling the excavation.

The concrete floor slab from the former building appears to have restricted the metal and SVOC contamination to the soil/fill material lying on top of the slab. Concentrations of SVOCs and metals below the concrete slab did not exceed the commercial use soil cleanup objectives. Approximately six inches of soil/fill overlies the approximately 25,310 square foot concrete slab. This results in 470 cubic yards (752 tons) of contaminated soil/fill that would be removed.

The areal extent of impacted surface soil/fill in other portions of the site equals approximately 52,600 square feet. The analytical data indicates that the majority of the site contamination is limited to an average depth of one foot below grade. To ensure the removal of all surface contamination, the removal of the uppermost two feet of soil is recommended. Because soil/fill below one foot has been shown to contain low concentrations of contaminants, the conservative excavation of two feet of surface soil/fill will be sufficient for the removal of contaminated surface soil. The removal of two feet of material across the impacted area equates to a volume of approximately 3,825 cubic yards (6,120 tons) of contaminated soil/fill above commercial use SCGs, not including Area C. Due to the hazardous characteristics of Area C, this material is considered separately and includes approximately 75 cubic yards (120 tons) of contaminated surface soil/fill that is considered hazardous waste.

The extent of contaminated subsurface soil/fill material has been delineated using field observations and analytical data from test pits and borings. The approximate extent of subsurface contaminated soils is depicted on Figure 4 as Areas A through C. Because the uppermost two feet of soil would be removed from each of these areas as described above, the volume estimates for these areas do not include that quantity.

Area A contained elevated PID readings and petroleum staining and odors. This area includes the former 300-gallon UST location and also encompasses the TP-F location. The sample collected from TP-F from an impacted interval at eight feet below grade contained SVOC TICs but very low concentrations of only two SVOCs. To remove the nuisance characteristics, remediation would be completed to 10 feet below grade, resulting in an approximate soil volume of 1,245 cubic yards (1,992 tons).

SVOC soil contamination was detected at TP-15 at 1-1.5 feet below grade and appeared to extend to approximately 4 feet below grade based on field observations. Analytical results from TP-16 indicate that the contamination in the vicinity of that sample is limited to the surface. The estimated extent and depth of Area B result in an approximate soil volume of 90 cubic yards (144 tons). Confirmation sampling for SVOCs would be completed to ensure that the contamination has been removed.

Elevated concentrations of arsenic and lead were detected at approximately 2 feet below grade at TP-13. The impacted material in this test pit appeared to be backfill placed around a pipe to a depth of four feet. The metals concentrations in sample collected at 4.5 to 5 feet below grade were less than the commercial use SCOs and minimally above the unrestricted use SCG for only arsenic. The total estimated volume of Area

C (including the surface soil removal) is 150 cubic yards (240 tons) of soil. Confirmation samples will be necessary to ensure all metal contaminated soils were removed from this location.

Therefore based on the observations made during the investigation, it is anticipated that the total volume of subsurface soil contamination is 1,335 cubic yards (2,136 tons) of non-hazardous soils and 150 cubic yards (240 tons) of hazardous soils.

Alternative C: Cover System

Present Worth:..*$170,000*
Capital Cost:..*$120,000*
Annual Costs:...*$2,900*

A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one-foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick.

To mitigate the threat of erosion of the cover system and exposure of the underlying soil/fill, long-term monitoring of the cover system would also be necessary. For cost estimation purposes, the cover system would consist of clean fill installed in 6-inch lifts over the entire surface of the site (1,610 cubic yards). Additionally, topsoil would be installed over the clean fill in 6-inch lifts over the entire surface of the site (1,610 cubic yards). Finally, seeding of the topsoil surface would be installed.

Alternative D: Excavation of Highly Impacted Soil/Fill and Cover System Installation

Present Worth: *$540,000*
Capital Cost: *$500,000*
Annual Costs: *$2,900*

This alternative would include the excavation and removal of the highly impacted soil in Area A, B, and C as well as two areas (TP-C/TP-14 and SS-15) of surface soil having high total lead concentrations. A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one-foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick. Following placement of the cover material, commercial redevelopment could occur on the property, although an excavation work plan would be required to address any future invasive activities at the project site (component of SMP). To mitigate the threat of erosion of the cover system and exposure of the underlying soil/fill, long-term monitoring of the cover system would also be necessary.

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 environmental restoration projects in New York A detailed discussion of the evaluation criteria and comparative analysis is included in the RA 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 Department has determined to be applicable on a case-specific basis.

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

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated.

The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

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

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

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

7. Cost-Effectivness. Capital costs and annual 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 SI/RAR reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department 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 Department is proposing Alternative D: Excavation of Highly Impacted Soil and Cover System Installation 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 SI and the evaluation of alternatives presented in the RA.

The proposed remedy 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.

Because Alternative B, C and D satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

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 implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with other alternatives.

Alternative B, C and D all have short-term impacts which can easily be controlled using standard engineering practices. The time needed to achieve remediation goals would be longest for Alternative B. Alternative D would require less time to implement than B, but longer than that for Alternative C.

Long-Term Effectiveness and Permanence

This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. 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 controls intended to limit the risk, and 3) the reliability of these controls.

Achieving long-term effectiveness would be best accomplished by excavation and removal of the contaminated soils (Alternative B). Alternative B would be favorable because all the contaminated soil would be removed according to commercial future use. Alternative B and C could present some adverse impacts to on-property workers through dermal contact and inhalation related to excavation activities but the risk would be minimized through the use of personal protective equipment. Alternatives B, C and D include short term risks and the possibility of disruption of the community. These include: an increase in traffic flow along local roads during construction, noise from heavy equipment use and strong odors. This traffic would raise dust and increase noise levels locally. However, proper construction techniques and operational procedures would minimize these impacts. A cover system is considered a reliable remedial measure that, when properly designed and installed, provides a high level of protection. However, the need for long-term maintenance would be necessary for Alternative C and D due to residual contamination remaining in the soil beneath the cover system.

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.

Although Alternative C would not reduce the toxicity, mobility, or volume of the contaminated soil, the placement of a cover system across the site would limit the exposure to the contaminants. Alternative D would reduce the mobility and toxicity of the contaminants through removal and proper off-site disposal of all the soil that exceeds commercial use SCOs, whereas Alternative B would also reduce the mobility and toxicity of the contaminants through removal and proper off-site disposal. However, Alternative B would restrict the soils removed to just the most highly contaminated, and provide for a cover system similar to that of Alternative C.

Implementability

The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and equipment is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

While all alternatives are easily implementable, Alternative B would require the excavation of all the contaminated soil on-site. This could be hindered due to the presence of the foundation of the previously existing building. Alternative D would have some implementation issues because of foundations, but because the volume of excavated soil is less, the difficulty level would decrease. Alternative D would require the removal of 850 cubic yards of soil, while Alternative B would require the removal of 5,800 cubic yards of soil. Alternative C does not require the removal of any soil. Restriction on the use of the property would be required for Alternatives D and C.

Cost Effectiveness

Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision.

The cost of the alternatives varies significantly. Although exposure pathway removal and containment (Alternative C) would be less expensive than excavation (Alternative B) they are not permanent remedies. Alternative D combines elements of Alternative C and D. Alternative B would be favorable because it would be a permanent remedy that would eliminate a source of contamination at the site. However, it would be the most costly remedy and its implementability and effectiveness is uncertain. Alternative D

Alternative C would offer the best cost effectiveness at a present worth of $170,000. Following Alternative C is Alternative D with a present worth of $540,000. The least cost effective is Alternative B with a present worth of $940,000.

Community Acceptance

No information on community acceptance has been received at this time.

The estimated present worth cost to implement the remedy is $ 540,000. The cost to construct the remedy is estimated to be $ 500,000 and the estimated average annual costs for 30 years is $ 2,900.

The elements of the proposed remedy are as follows:

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

2. Excavation and removal of the highly impacted soil in Area A, B and C, as well as the two areas identified as TP-C/TP-14 and SS-15 (see Figure 4).

3. A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one-foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick.

5. Imposition of an institutional control in the form of an environmental easement that would require (a) limiting the use and development of the property to commercial use, which would also permit industrial use; (b) compliance with the approved site management plan; (c) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

6. Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below the soil cover's demarcation layer, pavement, or buildings. Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) identification of any use restrictions on the site; and (d) provisions for the continued proper operation and maintenance of the components of the remedy.

7. The property owner would provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal would: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that would impair the ability of the control

to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program would be instituted. This program would allow the effectiveness of the cover system to be monitored and would be a component of the long-term management for the site.

Table 1

Summary of Analytical Results - Background Samples
Niagara Motors Site

	SOIL CLEANUP OBJECTIVE COMMERCIAL USE	SOIL CLEANUP OBJECTIVE UNRESTRICTED USE	AVERAGE SITE BACKGROUND VALUE	SS-BG1(0.5)-SS-0	SS-BG2(0.5)-SS-0	RSS-SS21-S-O-215MRD	RSS-SS22-S-O-449SRRD
Date Collected:			-	10/13/05	10/13/05	9/17/02	9/17/02
Project Collected for:			-	Niagara Motors	Niagara Motors	Roblin Steel	Roblin Steel
Semi-Volatile Organic Compounds (ug/Kg)							
Acenaphthene	500,000	20,000	-				10 J
Acenaphthylene	500,000	100,000	-			50 J	25 J
Anthracene	500,000	100,000	-	620 J		48 J	50 J
Benzo(a)anthracene	5,600	1,000	-	2,400 J	240 J	250 J	280 J
Benzo(a)pyrene	1,000	1,000	-	2,600 J	310 J	320 J	330 J
Benzo(b)fluoranthene	5,600	1,000	-	2,200 J	310 J	460	430
Benzo(g,h,i)perylene	500,000	100,000	-	1,800 J	270 J	180 J	160 J
Benzo(k)fluoranthene	56,000	800	-	1,900 J	270 J	280 J	260 J
Butyl benzyl phthalate	500,000**	100,000*	-				12 J
Carbazole	500,000**	100,000*	-			37 J	42 J
Indeno(1,2,3-cd)pyrene	5,600	5,600*	-	1,600 J	230 J	180 J	160 J
Chrysene	56,000	1,000	-	2,700 J	360 J	340 J	380
Dibenz(a,h)anthracene	560	330	-			80 J	73 J
Dibenzofuran	500,000**	100,000*	-			38 J	14 J
Bis(2-ethylhexyl)phthalate	500,000**	100,000*	-		120 J		
Fluoranthene	500,000	100,000	-	6,900	770 J	630	800
Fluorene	500,000	100,000	-			15 J	21 J
2-methylnaphthalene	500,000**	100,000*	-			88 J	24 J
Naphthalene	500,000	12,000	-			54 J	15 J
Phenanthrene	500,000	100,000	-	3,800 J	520 J	350 J	410
Pyrene	500,000	100,000	-	4,600	490 J	450	560
Tentatively Identified Compounds	-	-	-	17,250	13,130	-	-
Metals (mg/kg)							
Arsenic	16	13	12.5	12.4 *	13.6 *	12.7 J	11.2 J
Barium	400	350	96.7	86 *N	108 *N	66.9 J	126 J
Cadmium	9	3	0.74	0.83 B	0.98 B	0.47 B	0.67
Chromium	10,000	30	20.4	16.6 *NJ	21 *NJ	14.6 J	29.4 J
Lead	1,000	63	106	56.9 *	52.8 *	127 J	188 J
Mercury	3	0.18	0.08	0.09 B	0.07 B	NA	NA
Selenium	1,500	4	1.35			1.4	1.3
Silver	1,500	2	0.70	0.95 B*	1 B*		0.1 B

Notes:

1. PCBs were not detected in any of the background samples.
2. Soil Cleanup Objectives source is 6NYCRR Part 375 Environmental Remediation Programs December 2006 Edition (Part 375)
3. ug/kg = micrograms per Kilogram (equivalent to parts per billion or ppb)
4. mg/kg = milligrams per Kilogram (equivalent to parts per million or ppm)
5. Average site background values for inorganic analytes were determined by averaging the results from the background samples with detectable concentrations.
6. Only compounds with one or more detections are shown.
7. Blank spaces indicate that the analyte was not detected.
8. Definitions of data qualifiers are presented in Table 9.
9. Sample depth is displayed next to location in parenthesis [eg TP-4(2) refers to a 2 foot below grade sample depth]

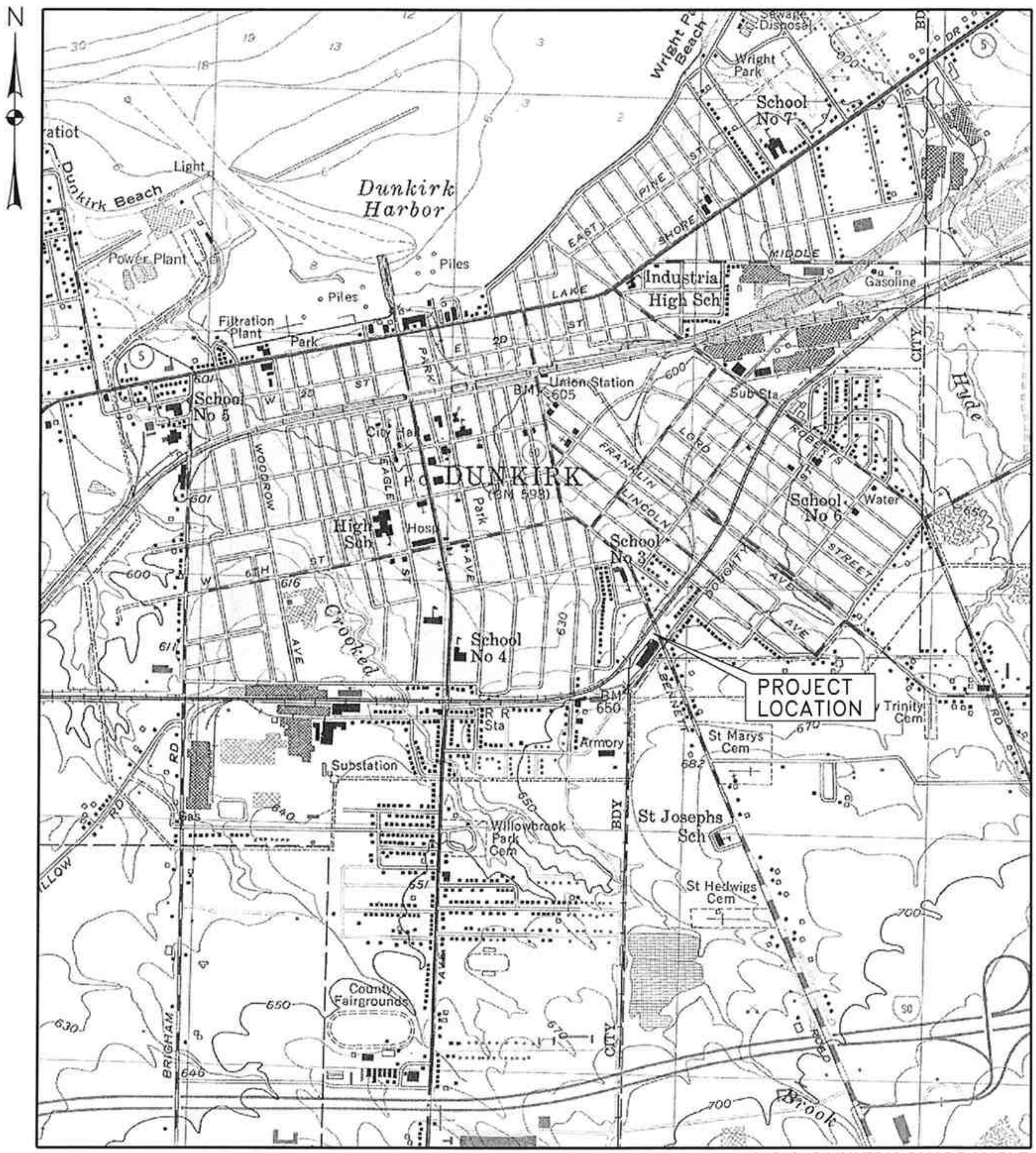
** the cap for individual SVOCs that do not have a set SCO is 500,000 ug/kg for commercial use and 100,000 ug/kg for unrestricted use

Shaded represents exceedances over the Unrestricted and Commercial Cleanup Objectives at the sample depth

Shaded represents exceedances over the Unrestricted Cleanup Objectives at the sample depth

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
A. No Action	$ 0	$ 0	$ 0
B. Removal of All Contaminated Soil/Fill Above SCOs	$ 940,000	$ 0	$ 940,000
C. Cover System	$ 120,000	$ 2,900	$ 170,000
D. Excavation of Hazardous Soil/Fill and Cover System Installation	$ 500,000	$ 2,900	$ 540,000



U.S.G.S DUNKIRK QUADRANGLE

PROJECT SITE LOCATION MAP

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REMEDIAL INVESTIGATION/
ALTERNATIVES ANALYSIS PROGRAM
FORMER NIAGARA MOTORS SITE
CITY OF DUNKIRK, NEW YORK
CHAUTAUQUA COUNTY

PROJECT NO. 2004.0124.01	SCALE: 1" = 2000'	DATE: 07/28/06	FIGURE NO. 1

CONTAMINANTS OF CONCERN- SURFACE SOILS

LEGEND

■	SURFACE SOIL SAMPLE LOCATION
⬚	UST LOCATION
◭	MONITORING WELL LOCATION
◐	TEST PIT LOCATION
◒	TEST BORING LOCATION
◐■	TEST PIT AND SURFACE SOIL LOCATION

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP-10(1) means soil sample was collected from test pit 10 at one foot below grade)

TP-C (0.5)		TP-C (1)	
ARSENIC	401	ARSENIC	120
CADMIUM	22.5	CADMIUM	1,040
CHROMIUM	2,370	CHROMIUM	43.3
LEAD	53,200	LEAD	34,100

TP-14 (1-1.2)		TP-14 (0.1-0.5)	
ARSENIC	16	ARSENIC	161
LEAD	1,090	LEAD	25,700

TP-13 (0.1-0.4)	
ARSENIC	19.0
TP-13 (2.0-2.2)	
TCLP LEAD	56.1

TP-E (0.5)/ SS-2	
ARSENIC	65.5
CADMIUM	24.6
LEAD	47,100

SS-3 (0.5)	
ARSENIC	20.3

SS-19 (0.8-1.0)	
ARSENIC	16.5

TP-B (1.0)	
BENZO(a)PYRENE	2,000

SS-13 (0.5)	
ARSENIC	30.2
BARIUM	1,200
LEAD	3,900

SS-28 (0.5)	
BENZO(a)ANTHRACENE	10,000
BENZO(a)PYRENE	14,000
BENZO(b)FLUORANTHENE	14,000
INDENO(1,2,3-cd)PYRENE	8,500
DIBENZ(a,h)ANTHRACENE	2,800

SS-12 (0.5)	
ARSENIC	18

SS-4 (0.5)	
ARSENIC	75.8
LEAD	1,350

SS-29 (0.5)	
LEAD	32.7

SS-15 (0.5)	
ARSENIC	266
LEAD	25,100

TP15 (0.2-0.5)	
BENZO(a)ANTHRACENE	9,200
BENZO(a)PYRENE	13,000
BENZO(b)FLUORANTHENE	14,000
INDENO(1,2,3-cd)PYRENE	11,000
DIBENZ(a,h)ANTHRACENE	3,200

SS-27 (0.5)	
BENZO(a)ANTHRACENE	10,000
BENZO(a)PYRENE	16,000
BENZO(b)FLUORANTHENE	15,000
INDENO(1,2,3-cd)PYRENE	11,000
DIBENZ(a,h)ANTHRACENE	3,500

SS-25 (0.5)	
BENZO(a)ANTHRACENE	5,600
BENZO(a)PYRENE	9,000
BENZO(b)FLUORANTHENE	9,200
INDENO(1,2,3-cd)PYRENE	6,500
DIBENZ(a,h)ANTHRACENE	1,900

SS-14	
ARSENIC	35.7
LEAD	3,160

SS-5 (0.5) - METALS	
ARSENIC	67.0
LEAD	6,880

SS-5 (0.5) - ORGANICS	
BENZO(a)ANTHRACENE	60,000
BENZO(a)PYRENE	120,000
BENZO(b)FLUORANTHENE	110,000
BENZO(k)FLUORANTHENE	100,000
INDENO(1,2,3-cd)PYRENE	100,000
CHRYSENE	85,000
DIBENZ(a,h)ANTHRACENE	28,000

TP-6 (0.3-0.5)	
ARSENIC	20.8
LEAD	1,290

SS-16 (0.5)	
ARSENIC	51.8
LEAD	6,420

COMMERCIAL USE CLEANUP OBJECTIVES - METALS

16	ARSENIC
9.3	CADMIUM
1,500	CHROMIUM
1,000	LEAD
1,500	SILVER

COMMERCIAL USE CLEANUP OBJECTIVES - ORGANICS

5,600	Benzo(a)anthracene
1,000	Benzo(a)pyrene
56,000	Benzo(b)fluoranthene
5,600	Benzo(k)fluoranthene
5,600	Indeno(1,2,3-cd)pyrene
560	Dibenz(a,h)anthracene
56,000	Chrysene

NOTE:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.

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FORMER NIAGARA MOTORS SITE
CITY OF DUNKIRK
CHAUTAUQUA COUNTY, NY

PROJECT NO. 2004.0124.01	SCALE: 1" = 60'	DATE: 02/05/08	FIGURE NO. 2

LEGEND

■	SURFACE SOIL SAMPLE LOCATION
⬚	UST LOCATION
◭	MONITORING WELL LOCATION
◕	TEST PIT LOCATION
◒	TEST BORING LOCATION
◈	TEST PIT AND SURFACE SOIL LOCATION
⬚	EXTENTS OF SUBSURFACE CONTAMINATION

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP-10(1) means soil sample was collected from test pit 10 at one foot below grade)

TP13 (2-2.2)	
ARSENIC	579
LEAD	86,000

TPE (3.5)	
ARSENIC	24.7

TP15 (1-1.5)	
Benzo(a)anthracene	12,000
Benzo(a)pyrene	17,000
Benzo(b)fluoranthene	18,000
Indeno(1,2,3-cd)pyrene	14,000
Dibenz(a,h)anthracene	4,600

COMMERCIAL USE CLEANUP OBJECTIVES - METALS	
16	ARSENIC
9.3	CADMIUM
1,500	CHROMIUM
1,000	LEAD
1,500	SILVER

COMMERCIAL USE CLEANUP OBJECTIVES - ORGANICS	
5,600	BENZO(A)ANTHRACENE
1,000	BENZO(A)PYRENE
5,600	BENZO(B)FLUORANTHENE
5,600	INDENO(1,2,3-CD)PYRENE
560	DIBENZ(A,H)ANTHRANCENE

NOTE:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.

60' 30' 0 60'
SCALE: 1"=60'-0"

CONTAMINANTS OF CONCERN- SUBSURFACE SOIL

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FORMER NIAGARA MOTORS SITE
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PROJECT NO. 2004.0124.01	SCALE: 1" = 60'	DATE: 02/05/08	FIGURE NO. 3

REMEDIATION AREAS

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FORMER NIAGARA MOTORS SITE
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PROJECT NO. 2004.0124.01	SCALE: 1" = 60'	DATE: 02/05/08	FIGURE NO. 4