SOIL MANAGEMENT PLAN

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA, NEW YORK

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GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA, NEW YORK

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General Motors Powertrain Group
Tonawanda, New York

The material and data in this report were prepared under the supervision and direction of the undersigned.

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1.0 INTRODUCTION

General Motors Corporation (GM) is preparing this Soils Management Plan (SMP) to support the environmental component of an overall plan designed to re-use non-hazardous granular fill that will be generated during construction activities associated with the GM Inline 4/5 Plant Expansion Project. As an added benefit, this project will be used to re-grade the 15-acre parcel of GM land located on the northeast corner of Plant 4 commonly referred to as the former DuPont Landfill. The 15-acre parcel of land is part of the former Du Pont Landfill purchased by GM in the 1970's. The site has been delisted from the New York State Department of Environmental Conservation's "*Registry of Inactive Hazardous Waste Disposal Sites in New York State*".

Under Title 6, New York Codes, Rules, Regulations, Part 360, Section 1.15 Beneficial Use (6 NYCRR Part 360-1.15), the NYSDEC has established a number of exemptions or what are commonly referred to as pre-determined BUDs. It is based on these pre-determined BUDs or exemptions outlined in 6 NYCRR Part 360-1.15, that GM intends to re-use an estimated 40,000 to 65,000 cubic yards of excavated soils generated from the construction of building footers and utilities, parking lots, and access roadways for re-grading the former DuPont Landfill GM currently owns. The Beneficial Use exemptions outlined in 6NYCRR Part 360-1.15(b)(7,8,9) identify both uncontaminated and nonhazardous contaminated soil from construction projects as being "no longer considered solid waste for the purposes of this Part when used as described in this subdivision:…" Those re-uses are "…fill material, in place of soil native to the site of disposition;" and "…which is used as backfill for the same excavation or excavations containing similar contaminants at the same site…" In addition to identifying soils as being exempt, "recognizable, uncontaminated concrete and concrete products, asphalt pavement, brick…" are also exempt for re-use without NYSDEC department approval when re-used in the manners outlined in the exemption (i.e., when used as a substitute for conventional aggregate).

In support of the soil re-use activities, grading design drawings and standard operating procedures (SOPs) have been developed and are attached in Appendix A and Attachment 1, respectively. The grading design details and SOPs include the details required to re-grade the 15-acre parcel of land located on the northeast corner of Plant 4 . This SMP is being submitted to the NYSDEC for informational purposes based on the pre-determined beneficial use exemptions outlined in 6 NYCRR Part 360-1.15.

The soils to be re-used will be generated during various construction phases of the Inline 4/5 Plant Expansion Project and have been identified as Source Areas A, B, and C. Source Area A is located along the south property boundary of the American Axle & Manufacturing (AAM) facility and currently is a railroad right of way. This area will be the site of a new access road to be constructed by the Erie County Industrial Development Agency (ECIDA) and ultimately maintained and operated by the Town of Tonawanda. Source Area B is a 4.5-acre parcel situated on the north side of the 12-acre parcel of land located at 344 Vulcan Street. The 12-acre parcel located at 344 Vulcan Street was recently purchased by GM as part of the planned expansion. The northern 4.5 acres of the 12-acre parcel will be the site of a Utility Services Building that will be constructed and operated by DTE Energy Services. DTE Energy Services will purchase the 4.5-acre parcel from GM prior to operation. Source Area C will encompass the southern 7.5-acres of the 12-acre parcel located at 344 Vulcan Street and the current GMPTG property in which GMPTG Plant 5 is situated on. As a result of the planned construction activities, CRA has received estimates from the ECIDA, DTE, and GM WFG Capital Projects staff indicating that between 40,000 to 65,000 cubic yards of excavated soils will be generated during excavation activities and available for re-use at the GMPTG facility. Reuse of the soil materials will provide an environmental benefit to the GMPTG site and will avoid unnecessary use of valuable local landfill space, as well as provide a significant financial impact to the project (beneficial use). Not only will GM realize a financial savings, the ECIDA, who will be providing State and local funding for the construction of a new access road (Source Area A) will also be able to realize a significant financial savings.

GM and various outside parties associated with the construction and future ownership of designated portions of the construction area have conducted several site assessments for the purpose of assessing the environmental impact, if any, of site soils located in the Source Areas. The environmental impact of the site soils was determined using EPA approved field screening analysis and fixed lab analysis with EPA approved methods. To properly characterize soils, the field screening and laboratory data was evaluated as an entire data set for each area and statistically evaluated in order to develop a "true concentration" representative of the whole Source Area. The results of the laboratory testing, evaluation of the beneficial use of the material, and supporting information are presented within this document.

Since it is difficult to anticipate and identify all potential environmental issues associated with an area this large in which construction soils will be generated from, GM will visually monitor excavation materials to ensure that they are consistent with soils encountered during previous investigations and presented in this document. Should suspect materials not consistent with what has been identified during previous investigations be encountered during site construction activities, the materials will be segregated and placed on visqueen for re-evaluation. Should the laboratory results indicate that the materials are consistent with the materials identified during previous investigations, the materials will be transported to the former landfill area for re-use. However, should the laboratory results indicate that the material is not suitable for re-use at the re-grading project (i.e., statistically dissimilar to the other site materials), it will be the responsibility of the construction contractor(s), with the aid of CRA, to ensure that the materials are properly managed and sent to an approved off-site disposal facility.

2.0 DESCRIPTION OF BY MATERIALS AND USES

2.1 SITE DESCRIPTION

The GMPTG Engine Plant Facility is a multiple building manufacturing facility located at 2995 River Road, Tonawanda, New York (Figure 1 and 2). Environmental cleanup and demolition activities will be on-going at the GMTPG Plant 5 and the adjacent property located at 344 Vulcan Street in support of the Plant Expansion Project. Plant 5 and the 344 Vulcan Street parcel are being readied to make way for the construction of a new 700,000 square foot manufacturing building for the production of the Inline 4/5 engine. The entire facility currently employs approximately 4,500 people, with the retention of approximately 600 employment opportunities once construction of the new plant is complete.

As indicated earlier, based on the exemptions outlined under 6 NYCRR Part 360-1.15, GM intends to re-use an estimated 40,000 to 65,000 cubic yards of excavated soils generated from the construction of building footers and utilities, parking lots, and access roadways for re-grading 15-acre area north of Plant4. The estimated 40,000 to 65,000 cubic yards of soil material will be generated during construction activities since the Site soils are not suitable to be re-used as competent construction backfill based on poor structural capacity. The poor fill materials will be removed during foundation and utility work and replaced with suitable engineered fill. However, the excavated materials are well suited to be re-used as backfill at the 15-acre parcel north of Plant 4to support re-grading undeveloped portions of the property and ultimately covering these areas with grass. The soil materials will be generated from three areas that are delineated on the basis of the scope of work being performed and the contractor performing the work. CRA has designated these three areas as Source Area A, Source Area B, and Source Area C (Figure 3).

2.1.1 SOURCE AREA A

Source Area A is situated along the southern property boundary of the AAM facility located in an old railroad right-of-way (ROW) currently owned by GMPTG (a portion of the rail line still provides service to AAM). Historically, Source Area A has functioned as a railroad ROW providing rail service to the GMPTG Foundry, Forge (now AAM), and Manufacturing Plant #1. In order to facilitate the construction and maintenance of a new Plant access road, GM will transfer the railroad ROW property to the Town of Tonawanda prior to construction of the new road. Once transferred, the ECIDA will provide County and State of New York funding for the construction of the new access road. Source Area A will specifically encompass the railroad ROW from Kenmore Avenue westward for 2,100 feet and a width of approximately 53 feet. At 2,100 feet, GM will connect GMPTG infrastructure roadway to the Town of Tonawanda access road. Excavation materials will be generated in Source Area A as a result of the construction of the access road. The access road is currently designed to be constructed along the southern edge of the railroad ROW, with curb cuts into the AAM property. Based on estimates provided by the ECIDA, it is expected that approximately 5,000 to 10,000 cubic yards of soil material unsuitable for road construction will be generated. Roadway construction activities will involve the removal of approximately 2.0 to 2.5 feet of fill material which will be replaced with engineered fill to provide a stable road base for construction activities. The attached Figure 4 outlines the approximate location of the access road and the area north of the access road into the AAM property.

2.1.2 SOURCE AREA B

Source Area B is situated in the northeast corner of the 12-acre parcel located at 344 Vulcan Street. The 12-acre parcel of land located at 344 Vulcan Street has historically been utilized as light to moderate industrial manufacturing since 1917. Since 1917, the property has had a number of owners which manufactured items such as Navy ships, heavy machinery, castings, and foam products as wells as site structures which have included warehouses, manufacturing buildings, and a powerhouse. In 1983, the site was completely destroyed by fire, with the exception of the front office building.

Source Area B is specifically a 4.5-acre area situated at the northern section of the 344 Vulcan Street property. As part of the Plant expansion, GM will be outsourcing the construction and the operation and maintenance of its Utility Services Building (USB) which will include the operation of an Industrial Wastewater Treatment Plant (IWTP) and a chilled water building. DTE Energy Services will provide operation and maintenance services for the USB, which will support the manufacturing operations of the new Inline 4/5 Plant. Excavation materials will be generated in Source Area B as a result of the construction of various footers, utilities, and facility structures necessary for the construction of the USB. Based on estimates provided by DTE Energy Services, it is expected that approximately 5,000 to 10,000 cubic yards of soil material unsuitable for construction will be generated. The attached Figure 5 outlines the approximate location of the proposed USB facility to be constructed at the north end of the 344 Vulcan Street parcel.

2.1.3 SOURCE AREA C

Source Area C is comprised of the remaining property located at 344 Vulcan Street and the property surrounding Plant 5, including Plant 5. As previously indicated, the property at 344 Vulcan Street has historically been utilized for light to moderate industrial manufacturing. The property surrounding GMPTG Plant 5, including Plant 5 (280 Vulcan Street) has also been historically utilized for light to moderate industrial manufacturing similar to the activities conducted at 344 Vulcan Street. Excavation materials will be generated in Source Area C as a result of the construction of various footers, utilities, and facility structures necessary for the construction of the new Inline 4/5 manufacturing facility. Based on estimates provided by GM WFG Capital Projects personnel, it is expected that approximately 30,000 to 45,000 cubic yards of soil material unsuitable for construction will be generated. The attached Figure 6 outlines the approximate location of the proposed Inline 4/5 manufacturing facility.

2.2 BENEFICIAL USE DETERMINATION (BUD)

As indicated previously, GM is preparing this Soils Management Plan to support the environmental component of an overall re-grading project designed to minimize surface water run-off into nearby drainage swales, adjacent property, and storm water manholes and catch basins. GM intends to re-use 40,000 to 65,000 cubic yards of soils excavated during the GMPTG Plant expansion construction activities to grade low areas at the 15-acre parcel located north of Plant 4 (former DuPont landfill property). Once the excavated soil materials have been used to re-grade the 15-acre parcel, GM will cover the material with a 6-inch layer of topsoil and then hydro-seed creating a "green-space" at the GMPTG facility. The attached Figure 7 outlines the area intended to receive excavated soil materials, which has been designated Area 1.

2.2.1 ENVIRONMENTAL BENEFIT

Aside from obvious economic benefits of re-using the excavated soil materials, there are also environmental benefits. As a result of site-wide investigations, the 15-acre parcel has been identified as a potential source area for the introduction of sediments into the facility's storm sewer system via a railroad drainage swale. Although there is no evidence the surface water run-off in this area has contributed to PCBs in the storm sewers, GM has identified re-grading the 15-acre parcel as a preventive measure to minimize the potential for sediments, if any, from entering the storm sewers via surface water run-off from the area. GM intends to re-use an estimated 40,000 to 65,000 cubic yards of excavated soils generated from the construction of building footers and utilities, parking lots, and access roadways for re-grading and seeding of the 15-acre parcel. The grading design details and SOPs propose to re-grade the 15-acre area to allow for surface water run-off, if any towards the eastern edge of the property, thereby eliminating surface water run-off from the area to surrounding properties.

The issues of enhanced water movement through the 15-acre area as a consequence of adding soil to this area has also been examined. The grading design details do not call for the introduction of additional sources of water to the area. Currently, surface water run-off from the area is negligible and as such, waters that are being introduced to the 15-acre area are dissipating via percolation into the subsurface soils or through evaporation to the atmosphere. Based upon the grading design detail, the additional soils placed on the 15-acre area would re-direct surface waters that normally fall upon the area towards the eastern edge of the area where a combination swale and berm will be constructed, preventing surface waters from leaving this area. The grading design details call for the planting of grass that would increase evapo-transpiration (uptake through roots and transpiration out from leaves), thereby reducing infiltration of surface water into the subsurface. Waters not lost to evaporation and evapo-transpiration will be easily accommodated by the absorptive capacity of the additional soils as well as the existing soils, or be transported to the swale on the eastern edge of the parcel.

In addition to providing an on-site environmental benefit, the re-grading of the 15-acre area (former landfill area) utilizing construction activities soils (unsuitable for construction requirements) would reduce the amount of "clean" fill material requiring off-site disposal at local landfills. The re-use of the construction soils would promote the conservation of limited and valuable landfill space which could be better utilized for non-reusable materials.

2.2.2 ECONOMIC BENEFIT

The economic benefit of re-using the construction excavation soils at the 15-acre area would be realized on several levels by various entities. Based on the current regional cost of $25.00 per ton for transportation and disposal of the excavated materials to a local non-hazardous solid waste landfill as landfill cover at waste cells, the combined cost to dispose of the excavated materials from the three Source Areas would range from $1.5 M to $2.44 M for 40,000 to 65,000 cubic yards (estimated to be 60,000 to 97,500 tons), respectively. These cost savings would be realized by GM, the ECIDA, the State of New York, and DTE Energy Services (ultimately a cost savings to GM).

The ECIDA and the State of New York are providing the funding for the construction of a new access road (Source Area A) which is estimated to generate approximately 5,000 to 10,000 cubic yards of material during construction activities. It is estimated that the ECIDA and State of New York could realize a savings of approximately $187,500 to $375,000 due to the re-use of construction soils as opposed to off-site disposal.

DTE Energy Services, who will be constructing and operating GM's USB, has estimated that approximately 5,000 to 10,000 cubic yards of soil will also be generated during the construction phase of the new USB. As a result, DTE Energy Services, and ultimately GM could realize a savings of $187,500 to $375,000 due to the re-use of construction soils as opposed to off-site disposal.

GM will also realize a cost savings by re-using the soil materials as opposed to off-site disposal. GM's construction contractor estimates that approximately 30,000 to 45,000 cubic yards of construction soils will be generated. Based on a disposal cost of $25 per ton, GM could realize a savings as much as $1.125 M to $1.6875 M. In addition to a cost savings associated with not disposing of materials at an off-site facility, GM would also realize an additional cost savings since "clean fill" material to re-grade the 15-acre area would not need to be purchased. The average transportation and per ton costs for fill material is approximately $25 per ton. Assuming the need for approximately 30,000 cubic yards (estimated 45,000 tons) of fill material to properly re-gradethe 15-acre area, the purchase cost of the material would be $ 1.125M. It is also estimated that the expense to re-use the materials on-site and complete the grading activities would be approximately $350,000 to $500,000 for the area. The following table outlines the gross expenses and savings that could be realized through the re-use of construction soils.

Project Entity	**COSTS**	
	Savings	**Expenses**
ECIDA/NYS	$187,500 - $375,000	---
DTE Energy Services/GM	$187,500 - $375,000	---
GM – Disposal	$1,125,000 - $1,687,500	---
GM – Former Landfill Grading	$1,125,000	$350,000 - $500,000
Net Savings/Expense	$2,625,000-$3,562,500	$350,000-$500,000

This is an overall cost savings ranging from $2.625 M to $3.56 M.

3.0 PHYSICAL AND CHEMICAL CHARACTERIZATION OF EXCAVATED MATERIALS

The geology found in Source Areas A, B, and C is very heterogeneous, at best due to the presence of fill materials. In general, the stratigraphy consists of approximately three to nine feet of fill materials overlying reddish brown silty clay. A review of historical site investigations, County soil surveys, and NYSDEC geological information for the Source Areas indicates that Site soils are typically comprised of native silty clays, gravel, and sands intermixed with foundry sands, ash, brick and concrete (i.e., fill material) to a depth of approximately three to nine feet, where native reddish brown silty clay is encountered. Historical hydrogeological evaluations of the silty clay layer indicate that it is approximately 30 to 40 feet in thickness and has a hydraulic conductivity of 1E-07 cm/sec to 1E-08 cm/sec. Underlying the clay layer is a five to ten-foot thick layer of gravelly sand/till that is underlain by bedrock. Bedrock typically lies from 45 to 55 feet below the ground surface. The Site is located in a commercial/industrial area with a gradually sloping topography to the west towards the Niagara River.

GM and various outside parties associated with the construction and future ownership of designated portions of the Plant expansion project have conducted several site assessments for the purpose of assessing the environmental impact, if any, as well as the geological capabilities of site soils located in the Source Areas. The environmental impact of the site soils was determined using EPA approved field screening analysis and off-site laboratories. For the purpose of this document, a discussion of the results of the geological capabilities of the various site soils is not applicable aside from the determination that the soils are not suitable for structural needs. The poor fill materials will be removed during roadway, foundation and utility work and replaced with suitable engineered fill. However, the excavated materials are well suited to be re-used at the 15-acre parcel (former DuPont Landfill) as grading material to support re-grading undeveloped portions of the property and ultimately covering these areas with grass.

Several rounds of sampling and analysis have occurred throughout the complex at different times for different purposes. Data was collected during investigations to determine potential PCB sources to storm sewers as well as part of due diligence associated with evaluation of property where property transfer may occur to implement construction. Typical laboratory analysis included Priority Pollutant or Target Compound List Volatile Organics (VOCs) and Semi-Volatile Organics (SVOCs), Total RCRA Metals or Target Analyte List Metals, PCBs, Cyanide, Total Pesticides and Herbicides and Total Organic Carbon. For the purpose of this Plan, the laboratory data was taken as an aggregate or whole for each area, as opposed to individual data points. Except for data collected in specific areas of contamination that have been identified, the available data was statistically evaluated, as described in Section 4.0, for each Source Area in order to develop a single "true concentration" representative of the whole Source Area. A more detailed discussion of the environmental samples and the statistical evaluation is presented in Section 4.0.

A brief review of the laboratory results indicate that the soils from the various Source Areas proposed to be re-used as fill on-Site are non-hazardous and typical for an industrial manufacturing site. A copy of the analytical summary tables and associated drawings and figures (if available) illustrating sampling locations throughout Source Areas A, B, and C can be found in the attached Tables Section and referenced throughout this document. Appendix B contains the summary page for the statistical evaluation of each Source Area and the identified chemical grouping, such as PCB laboratory data, PCB field screening data, VOCs, SVOCs, etc.

4.0 HUMAN HEALTH AND ENVIRONMENT IMPACT ASSESSMENT

In order to assess the potential environmental impact, if any, that the re-use of Source Area soils may have upon the Sites' environment, the laboratory data was taken as an aggregate or whole for each Source Area, as opposed to individual data points. The data was then statistically evaluated for each source area in order to develop a single "true concentration" representative of the whole Source Area. Tables 1 through 14 present a summary of the analytical results for the three Source Areas along with drawings and figures illustrating various sampling locations. The laboratory data summarized in the tables were compiled from numerous Reports and/or letters provided by various consulting and engineering firms. The hardcopy laboratory data and field screening raw data are not included in this Plan, however are on file at CRA's offices and at the Site. The following table identifies the summary table with the associated Source Area.

Source Area	Table No.		Source Area	Table No.
Source Area A	1		Source Area B	8
Source Area A	2		Source Area C	9
Source Area A	3		Source Area C	10
Source Area A	4		Source Area C	11
Source Area A	5		Source Area C	12
Source Area B	6		Source Area C	13
Source Area B	7		Source Area C	14

4.1 STATISTICAL EVALUATION OF DATA

For the purpose of this Plan, the laboratory data was taken as an aggregate or whole for each area, as opposed to individual data points, and statistically evaluated. In order to evaluate the laboratory data for soil samples collected during the various investigations, site-specific "true concentrations" were developed based upon the statistical average or mean concentration of the evaluation area. The site-specific "true concentration" is considered to be representative of the background conditions for the Site since it will continue to be used as an industrial manufacturing facility. The site-specific "true concentrations" are site-specific average values to be used for comparison purposes with established exposure pathway criteria (i.e., direct contact, inhalation, volatilization, etc.) that would be expected based on the relevant land use scenario under consideration. These "true concentrations" or screening levels were developed using commonly accepted statistical calculations for likely human exposure pathways and conservative estimates regarding the potential for human contact.

4.1.1 ACCEPTABILITY OF COMPARISON CRITEIRA

The acceptability of the use of risk-based screening criteria (RSBC) (i.e., exposure pathway criteria) are derived from the algorithms outlined in the USEPA's *Risk Assessment Guidance for Superfund (RAGS) Human Health Evaluation Manual (HHEM) Part B* – Development of Risk-Based Preliminary Remediation Goals (USEPA, 1991), as subsequently applied by USEPA (1996a,b) in the development of soil screening levels (SSLs). The equations are structured to allow use of exposure variables based on likely land use scenarios. USEPA risk assessment guidance under RAGS Part A (USEPA, 1991) lists default upper-bound exposure variables for standard scenarios, but does not provide refinement within basic land use categories.

To address this gap and thereby develop a screening mechanism for addressing different commercial scenarios, the Michigan Department of Environmental Quality (MDEQ) has applied the USEPA methodology to derive generic risk-based criteria for residential, industrial, and for commercial subcategory land use scenarios. The MDEQ approach allows application of the USEPA model to a variety of potential site use categories and makes full use of the flexibility intended by the risk-based USEPA guidance. The MDEQ subcategory assumptions are especially applicable to New York, as they account for climate conditions that are comparable in Michigan and New York.

MDEQ has several commercial/ industrial categories, identified as "Industrial" and "Commercial Subcategory I through IV." The MDEQ Generic commercial subcategory II/industrial cleanup criteria would be applicable to the Site.

The industrial generic cleanup criteria were developed by the MDEQ to be protective of an employee at an industrial site. The generic values were established using exposure assumptions to be protective of a worker under applicable industrial land use scenarios. The exposure assumptions were established to be protective for a "reasonable" maximum exposure (RME). The RME is defined as the highest exposure that is reasonably expected to occur at a site using USEPA Guidance and US Department of Labor Statistics. The generic values published account for several different exposure pathways based on an industrial land use. Based on site uses and current construction activities, the MDEQ generic industrial criteria were deemed to address relevant exposure to site workers and employees as well as construction workers. The first, industrial direct contact criteria (DCC) values protect workers from long-term systemic health-effects from ingestion and dermal absorption of hazardous constituents in soils that would be at the surface and readily available. The second, industrial particulate soil inhalation criteria (PSIC) values protect workers from inhalation exposure route of contaminants suspected in airborne soil particles, especially during construction activities.

Once the site-specific "true concentrations" were developed, they were sequentially compared to New York State standards, published background data, and relevant generic risk-based criteria for an industrial Site. Comparisons were made in a sequential approach where contaminant concentrations were first compared to TAGM values, second to USEPA and USGS published background level ranges for inorganics (metals), and third to MDEQ relevant risk-based criteria discussed previously.

- As a first cut, the New York State Department of Environmental Conservation's Technical and Administrative Guidance Memorandum #4046 – Recommended Soil Cleanup Objective & Eastern USA Background, (January 24, 1994) was utilized; these are published residential numbers that are not relevant to the land use and human exposure scenario at the Site.

- ASTM "Cleanup Criteria for Contaminated Soil and Groundwater – Table 11- Background Concentrations of Elements in Soils" (pg. 51-52, January 1995) (Data collected and analyzed by the U.S. Geological Survey).

- "Trace Chemical Element Content of Natural Soils" (USEPA Office of Solid Waste and Emergency Response, Hazardous Waste Land Treatment, SW 874 (April 1983), Page 273, Table 6.46).

- Michigan Department of Environmental Quality – Part 201 Generic Cleanup Criteria Tables, Revision 1 – Industrial and Commercial (Categories) II, III, and IV" (June 7, 2000). Specifically, based on relevant land use and human exposure scenarios present at the Site, the MDEQ generic criteria were selected for comparison for dermal contact and ingestion as well as inhalation of soil particulates. The MDEQ published generic criteria used were industrial direct contact criteria (DCC) and industrial particulate soil inhalation criteria (PSIC). These criteria would be both protective of Site workers as well as construction workers involved with excavation and placement of soils.

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4.1.2 APPLICABILITY OF STATISTICAL EVALUATION

For the purpose of this Plan, the laboratory data was taken as an aggregate or whole for each area, as opposed to individual data points, and statistically evaluated. There are several reasons why statistical methods are applicable for evaluating the laboratory data for the various Source Areas. First, a single measurement indicates very little about the site-specific "true concentration" in the sampling location of interest, specifically Source Areas A, B, and C. In addition, if evaluating a large area based on individual data points there is no way of knowing if the measured concentration is a typical or an extreme value. The objective is to compare the site-specific "true concentration" to the relevant criteria. Secondly, in many cases the constituents of interest are naturally occurring (e.g., metals) and the naturally existing Site concentrations may exceed the relevant criteria. As such, background data must be statistically characterized to obtain a statistical estimate of an upper bound for the naturally occurring concentrations so that it can be confidently determined if on-site concentrations are above background levels. In this case, in the absence of established background levels, the relevant comparison is to NYSDEC TAGM 4046 Recommended Soil Cleanup Criteria for Residential Property and fixed RBSC (e.g., Michigan DEQ relevant generic industrial criteria) and established generic regional background concentrations, (e.g., NYSDEC Eastern US and USGS and EPA Background Concentrations of Elements in Soils). Copies of the reference materials are attached in Appendix C. Third, there is often a need to compare numerous potential constituents of concern to criteria or background, at numerous sampling locations. By chance alone there will be exceedances as the number of comparisons becomes larger. The statistical approach to this problem can insure that false positive results are minimized.

4.1.3 SOURCE AREA "A" – TOWN OF TONAWANDA ACCESS ROAD

As indicated previously, Source Area A is situated along the southern property boundary of the AAM facility located in an old railroad right-of-way (ROW) currently owned by GMPTG (a portion of the rail line still provides service to AAM). Historically, Source Area A has functioned as a railroad ROW providing rail service to the GMPTG Foundry, Forge (now AAM), and Manufacturing Plant #1. Source Area A will specifically encompass the railroad ROW from Kenmore Avenue westward for 2,100 feet and a width of approximately 53 feet. At 2,100 feet, GM will connect GMPTG infrastructure roadway to the Town of Tonawanda access road. The access road is currently designed to be constructed along the southern edge of the railroad ROW, encompassing an area of 28 feet wide by 2,100 feet long. Roadway construction activities will involve the removal of approximately 2.0 to 2.5 feet of fill material along the entire 53 feet wide ROW which will be replaced with engineered fill to provide a stable road base for construction activities. It is expected, as a result of the road construction activities, that approximately 5,000 to 10,000 cubic yards of unsuitable soil material will be generated.

Tables 1, 2, 3, 4, and 5 outline the results of the several subsurface investigations completed along the rail lines located in Source Area A. The investigation results for Tables 1, 2, 3, and 4 were provided by CRA and Blasland, Bouck & Lee (BBL) while Table 5 was provided by the Erie County Industrial Development Agency (ECIDA). Tables 1, 2, 3, and 4 summarize the laboratory and field screening PCB results. Table 5 provides a more comprehensive list of constituents, including PCBs, TAL Metals, VOCs, SVOCs, TOC, Total Pesticides and Herbicides.

A review of Tables 1, 2, 3, and 4 outline the results of the PCB investigations that have been completed along the rail line ROW. Based on the PCB data, two areas were identified where PCB levels were found to be greater than 10 mg/kg (NYSDEC TAGM 4046 subsurface recommended residential cleanup standard). The first area (Area A-1) is located between the north side of the rail line ROW and south of an area at the AAM Facility commonly referred to as the "Front Forty". The second area (Area A-2) is located adjacent to the current Plant 5 access road (See Figure 8 for the location of the two areas). The second area was previously identified by CRA as an area requiring further investigation (CRA Report – *Historical and Active Railroad Drainage Line Subsurface Investigation*, November 2000).

Area A-1 is located on the north side of the railroad ROW in an area that will not require the excavation of fill materials; specifically, the construction of the access road will be on the south side of the railroad ROW and will not extend far enough north to impact Area A-1. As such, no excavation activities will be occurring in the area and the soils will remain in place, undisturbed.

Area A-2 has recently undergone additional investigation by GMs' consultant (CRA) as recommended in the CRA Report "*Historical and Active Railroad Drainage Line Subsurface Investigation,*" November 2000 and agreed to by the NYSDEC. Based on the results of the supplemental investigation, GM has determined that this soil should be segregated from other materials and sent to an approved disposal facility because of elevated PCB levels (i.e., greater than 50 parts per million (ppm)). The laboratory results from the additional investigation, along with a drawing outlining the location of the investigation and the sample locations are included in Appendix D. As a result, the laboratory data from these two areas was not included in the PCB statistical analysis. The following table summarizes the statistical analysis of the laboratory and field screening PCB data for Source Area A.

Table 4.1.3-1 Area A PCB Statistical Analysis

Data Component	95% LCL	Mean	95% UCL	Comparison Criteria
				NYSDEC TAGM 4046
Laboratory Data (19 pts)	0.28 ppm	0.71 ppm	1.14 ppm	10 ppm
Field Screening (137 pts)	3.8 ppm	5.28 ppm	6.8 ppm	10 ppm

95% UCL = 95 % Upper confidence Limit
95% LCL = 95 % Lower Confidence Limit
ppm = parts per million or mg/kg

When evaluating the field screening data, the average of the range was used to represent the range. For example, if the field screening data indicate 1 to 5 ppm, the average of the range, 3 ppm, was used. If the field screening data indicated a range of 10 to 50 ppm, the average of the range, 30 ppm was used. For field screening results indicating PCB levels greater than 50 ppm, a value of 50 ppm was given to the data point, since it is not possible to establish an upper end of the range in order to calculate an average for the range. This procedure was used for all PCB field screening data throughout each Source Area.

Utilizing the mean concentration as the "true PCB concentration" for Source Area A, it is apparent that the representative laboratory PCB concentration for Source Area A, as a whole, would be 0.71 mg/kg while the representative field screening concentration for the area would be 5.28 mg/kg, both of which are below the Guidance Criteria. The statistical evaluation also indicates that when Source Area A is evaluated as a whole, the 95% probability of a detectable PCB level would result in a laboratory concentration between 0.28 mg/kg and 1.14 mg/kg while the PCB field screening would be between 3.8 mg/kg and 6.8 mg/kg. It should also be noted that field screening for PCB data has consistently been higher than fixed lab results.

A review of data Table 5 indicates SVOCs and total metals content consistent with the areas use as a railroad right-of-way (ROW) for an industrial manufacturing facility. Although several SVOCs were found to be present (Table 5) in the subsurface soils along the rail line ROW, the total SVOC content was considerably less than the NYSDEC Recommended Soil Cleanup Criteria for total SVOCs established in TAGM 4046. The following table summarizes the statistical analysis of the laboratory data for total SVOCs.

Table 4.1.3-2 Area A Total SVOC Statistical Analysis

Data Component	95% LCL	Mean	95% UCL	Comparison Criteria
				NYSDEC TAGM 4046
Laboratory Data (7 pts)	ND	1,631.4 ppb	3,986.5 ppb	500,000 ppb

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg
95% LCL = 95 % Lower Confidence Limit
ND = Non-detect

The statistical mean for the total SVOCs is 1,631.4 ug/kg while TAGM 4046 indicates a recommended cleanup level for total SVOCs of 500,000 ug/kg. The statistical evaluation also indicates that when Source Area A is evaluated as a whole, the 95% probability of a detectable SVOC level would result in a laboratory concentration between ND and 3,986.5 ug/kg.

A review of the total TAL metals (Table 5) content indicates several locations with concentration levels for chromium ranging from 10 to 55 ppm. The following table summarizes the statistical analysis of the laboratory data for total chromium.

Table 4.1.3-3 Area A Total Chromium Statistical Analysis

Data Component	95% LCL (ppm)	Mean (ppm)	95% UCL (ppm)	Comparison Criteria (ppm)					
				NYSDEC TAGM 4046	NYS Site Background*	USGS Background	EPA Background	MDEQ DCC	MDEQ PSIC
Lab Data (7 pts)	16.23	28.43	40.62	10 or SB	Range 1.5-40	Range=1-2,000	Range=1-1000	17,000	240

95% UCL = 95 % Upper confidence Limit
ppm = parts per million or mg/kg
* = NYS Site Background taken from TAGM 4046

95% LCL = 95 % Lower Confidence Limit
SB = Site Background

The statistical mean for the total chromium is 28.43 mg/kg while TAGM 4046 indicates a recommended cleanup level for total chromium of 10 mg/kg or site background. The statistical evaluation also indicates that when Source Area A is evaluated as a whole, the 95% probability of a detectable chromium level would result in a laboratory concentration between 16.2 mg/kg and 40.6 mg/kg. Although the statistical mean for the Source Area A as a whole is greater than the NYSDEC TAGM recommended residential cleanup guideline of 10 ppm, the USGS and EPA cite that the USEPA background range for chromium concentrations in soils is typically 1 to 1000 ppm while the NYS background range is 1.5 to 40 ppm. In both instances, the "true concentration" or mean falls well within the published ranges. In the absence of established site-specific background data, it is applicable to evaluate the site based on its future use (i.e., industrial) and to evaluate that the 95% probability of chromium's "true concentration" falls well within published ranges of background levels. Considering the industrial use of the area, the representative concentration or mean for the area is indicative of the background concentration of chromium in this industrial setting. A comparison of the representative concentration of 28.43 mg/kg to the MDEQ DCC and PSIC generic risk-based criteria indicate that the Site concentration is significantly less than the generic criteria developed for the protection of both Site workers as well as construction workers. As a result, the chromium content of the construction soils located in Source Area A is not considered to pose a significant environmental impact or health risk to Site workers and would not warrant the off-site disposal of excavated construction soils.

In addition to the presence of chromium, mercury was also identified at one sampling location out of seven. The following table summarizes the statistical analysis of the laboratory data for total mercury.

Table 4.1.3-4 Area A Total Mercury Statistical Analysis

Data Component	95% LCL (ppm)	Mean (ppm)	95% UCL (ppm)	Comparison Criteria (ppm)					
				NYSDEC TAGM 4046	Eastern USA Site Background*	USGS Background	EPA Background	MDEQ DCC	MDEQ PSIC
Lab Data (7 pts)	ND	0.13	0.3	0.10 or SB	Range 0.001-0.2	Range=ND-4.6	Range=0.01-0.3	1,100	ID

95% UCL = 95 % Upper confidence Limit
ppm = parts per million or mg/kg
ID – Inadequate data to develop criterion.
95% LCL = 95 % Lower Confidence Limit
* Taken from NYSDEC TAGM 4046

The statistical mean for the total mercury is 0.13 mg/kg while TAGM 4046 indicates a recommended cleanup level for total mercury of 0.10 mg/kg. The statistical evaluation also indicates that when Source Area A is evaluated as a whole, the 95% probability of a detectable mercury level would result in a laboratory concentration between ND mg/kg and 0.3 mg/kg. Although the statistical mean for the Source Area A as a whole is greater than the NYSDEC TAGM recommended residential cleanup guideline of 0.10 ppm, the USGS and EPA cite that the USEPA background range for mercury concentrations in soils is typically 0.01 to 0.3 ppm. A review of the "true concentration" or mean indicates that it falls well within the published ranges. In addition, the 95% probability also falls within the published ranges. Considering the industrial use of the area, the representative concentration or mean for the area is indicative of the background concentration of mercury in this industrial setting.

As discussed earlier in the introduction to the Section 4, statistical analysis of data subsets such as Source Area A data, a single measurement indicates very little about the "true concentration" in the sampling location of interest. In addition, if evaluating a large Source Area based on individual data points there is no way of knowing if the measured concentration is a typical or an extreme value. As such, a review of the data subset used to determine the statistical mercury mean indicates that six samples were non-detect at 0.1 mg/kg with only one detection of 0.59 mg/kg. When performing statistical evaluation, it is common practice when evaluating non-detect data to use one half the detection limit, in this case 0.05 mg/kg. However, the typical reporting limit for mercury analysis on a soil is 0.002 mg/kg. As a result, the use of the 0.05 mg/kg concentration value for non-detect values skews the statistical evaluation and biases the mean positively. Therefore the mean does not necessarily accurately represent the "true concentration" for Source Area A. Had the laboratory reported the mercury level at the required method detection limit of 0.002 mg/kg, the statistical mean would have been 0.09 mg/kg, which based on the data appears to be much more representative of the area. In addition, the NYSDEC TAGM is a residential cleanup criteria. The Source Area A, as well as the designated soil management areas where the construction soils would be re-used are industrial manufacturing areas. As a result, the comparison of the statistical mean to a generic risk-based criteria as opposed to a residential standard, such as the NYSDEC TAGM 4046, would be more appropriate. New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial and commercial property uses. Applying the Michigan DEQ DCC of 1,100 mg/kg for total mercury (there is no MDEQ PSIC for total mercury), the representative "true concentration" (mean equals 0.13 mg/kg) for mercury is considerably less than the more applicable comparison criteria.

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In summary, the mean or "true concentration" for total mercury falls well within the published ranges for naturally occurring background levels; the "true concentration" is positively skewed due to elevated method detection limits which in turn skews the statistical evaluation positively; and the "true concentration" is considerably less than the applicable MDEC DCC of 1,100 mg/kg. As a result, the mercury content of the construction soils located in Source Area A is not considered to pose a significant environmental impact or health risk to Site workers and would not warrant the off-site disposal of excavated construction soils from the area of the detection(s). The ECIDA also performed TCLP analysis on three of the seven samples for RCRA metals. The TCLP results were all non-detect.

Although some constituents were greater than the NYSDEC TAGM 4046 guidance values (residential criteria), based on the statistical evaluation of the data for Source Area A and comparison to published background levels and generic risk-based industrial criteria, proposed on-Site reuse of construction soils does not pose a significant health risk. The metal concentrations detected can be attributed to past property uses as well as the presence of various fill materials. The concentrations detected for metals are not uncommon for industrial properties within New York State and are likely indicative of the site background levels for this industrial setting and are all well below the generic risk-based industrial criteria.

In addition to the soil boring data presented in Table 5, data for three debris piles are also presented. GM does not intend to re-use the debris piles, which consist of discarded railroad ties and vegetation along with a limited amount of soil. The three debris piles will be sent off-site by the ECIDA for disposal at a local landfill. In addition to the off-site disposal of the three debris piles, the ECIDA will also be removing the existing railroad ties and disposing of them as solid waste at a local landfill.

To summarize, the soil materials to be excavated during the construction of the Town of Tonawanda access road that are unsuitable for roadway construction, do not pose a significant environmental impact or health risk which would warrant off-site disposal; therefore, GM intends re-use the estimated 5,000 to 10,000 cubic yards of material for the re-grading project. Three debris piles along with a designated portion of Area A-2 were identified as soil materials which will not be suitable to be reused for re-grading purposes and ultimately will be sent off-site for disposal. Area A-1 was identified as an area in which PCB levels were greater than the re-use evaluation criteria, however, the soil materials located in this area will not be disturbed during construction activities and therefore will remain undisturbed and in place.

4.1.4 SOURCE AREA "B"

As indicated previously, Source Area B is situated in the northeast corner of the 12-acre parcel located at 344 Vulcan Street. The 12 acre parcel of land located at 344 Vulcan Street has historically been utilized as light to moderate industrial manufacturing since 1917. Since 1917, the property has had a number of owners which manufactured items such as Navy ships, heavy machinery, castings, and foam products as wells as site structures which have included warehouses, manufacturing buildings, and a powerhouse. In 1983, the site was completely destroyed, with the exception of the front office building, by fire.

Source Area B is specifically a 4.5-acre area situated at the northern section of the 344 Vulcan Street property. As part of the Plant expansion, GM will be outsourcing the construction and the operation and maintenance of its Utility Services Building which will include the operation of an Industrial Wastewater Treatment Plant (IWTP) and a chilled water building to DTE Energy Services. Excavation soil materials will be generated in Source Area B as a result of the construction of various footers, utilities, and facility structures necessary for the construction of the USB. It is expected, as a result of the construction activities, that approximately 5,000 to 10,000 cubic yards of geotechnically unsuitable soil material will be generated.

Tables 6, 7 and 8 outline the results of the subsurface investigations completed at the property located at 344 Vulcan Street. The investigation results for Tables 6 and 7 were provided by CRA and encompass the entire 12 acre parcel located at 344 Vulcan Street. Table 8 was provided by ARCADIS Geraghty & Miller, Inc., (ARCADIS), and assesses the environmental aspects of only the 4.5 acre parcel that is being designated Source Area B. Although Tables 6 and 7 encompass the entire 12 acre parcel, a discussion of the results is appropriate since the data represents the Site as a whole and illustrates what would be expected to be found anywhere at the site (e.g., the 4.5 acre parcel designated Source Area B). Table 6 summarizes the laboratory and field screening PCB results. Tables 7 and 8 provide a more comprehensive list of constituents, including PCBs, RCRA Metals, VOCs, SVOCs, and TAL Metals.

A review of Tables 6 and 7 indicates that a combined 31 laboratory samples were collected for PCBs while 24 samples were field screened. The following table summarizes the statistical analysis of the laboratory and field screening PCB data.

Table 4.1.4-1 Area B PCB Statistical Analysis

Data Component	95% LCL	Mean	95% UCL	Comparison Criteria
				NYSDEC TAGM 4046
Laboratory Data (31 pts)	ND ppm	0.10 ppm	0.2 ppm	10 ppm
Field Screening (24 pts)	0.9 ppm	1.33 ppm	1.8 ppm	10 ppm

95% UCL = 95 % Upper confidence Limit
95% LCL = 95 % Lower Confidence Limit
ppm = parts per million or mg/kg

Utilizing the mean concentration as the "true PCB concentration" for Source Area B, it is apparent that the representative laboratory PCB concentration for Source Area B, as a whole, would be 0.10 mg/kg while the representative field screening concentration for the area would be 1.33 mg/kg, both of which are below all Guidance Criteria. The statistical evaluation also indicates that when Source Area B is evaluated as a whole, the 95% probability of a detectable PCB level would result in a laboratory concentration between ND and 0.2 mg/kg while the PCB field screening would be between 0.9 mg/kg and 1.8 mg/kg.

A review of Table 6, 7 and 8 identified several semi-volatile organic compounds (SVOCs) to be present in the soil samples collected at the site. The site geology identifies the fill materials at the site to be comprised of ash and cinders (likely from the facility fire), in addition to silt, gravel, small pieces of brick, and small pieces of concrete. The SVOCs detected in the samples are common by-products of combustion and are most probably the result of the 1983 fire. The following table summarizes the statistical analysis of the laboratory data for the identified SVOCs.

Table 4.1.4-2 Area B SVOC Statistical Analysis

Data Component	No. of Data Points	95% UCL (ppb)	Mean (ppb)	95% LCL (ppb)	Comparison Criteria (ppb)		
					NYSDEC TAGM 4046	MDEQ Industrial DCC	MDEQ Industrial PSIC
Anthracene	22	399.4	265.5	131.6	50,000	1,000,000,000	1,000,000,000
Benzo(a)anthracene	22	812.6	541.5	270.4	330 (MDL)	100,000	ID
Benzo(b)fluoranthene	22	1079.5	701.9	324.4	1,100	100,000	ID
Benzo(k)fluoranthene	22	246.5	197.1	147.6	1,100	1,000,000	ID
Benzo(g,h,i)perylene	22	274.3	230.3	186.3	50,000	9,100,000	350,000,000
Benzo(a)pyrene	22	655.2	451.2	247.1	330 (MDL)	10,000	1,900,000
Benzoic Acid	22	1531.6	1070.5	609.4	2,700	1,000,000,000	ID
Chrysene	22	787.9	540.4	292.8	400	1,000,000	ID
Dibenzofuran	22	252.6	218.3	183.9	6,200	ID	ID
Fluoranthene	22	1701.4	1083.0	464.6	50,000	180,000,000	1,000,000,000
Fluorene	22	298.1	249.3	200.6	50,000	130,000,000	1,000,000,000
Indeno(1,2,3-cd)pyrene	22	320.2	261.7	203.3	3,200	100,000	ID
Phenanthrene	22	1398.9	856.4	313.8	50,000	8,000,000	2,900,000
Pyrene	22	1549.6	1028.5	507.3	50,000	110,000,000	1,000,000,000

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg

95% LCL = 95 % Lower Confidence Limit
ID = Inadequate data to develop criteria

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A review of the statistical evaluation indicates that three mean or "true concentrations" exceed the TAGM 4046 guidance criteria. Benzo(a)anthracene, benzo(a) pyrene, and chrysene have a Source Area B representative concentration of 541.5 ppb, 451.2 ppb, and 540.4 ppb, respectively, while the TAGM 4046 residential cleanup guidance criteria are 330 ppb, 330 ppb, and 400 ppb, respectively. Source Area B, as well as the designated soil management areas where the construction soils would be re-used are industrial manufacturing areas. Source Area B also experienced a substantial structural fire in 1983. As a result, the comparison of the statistical mean to a generic risk-based criteria as opposed to a residential standard, such as the NYSDEC TAGM 4046, would be more appropriate. New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established generic risk-based direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial and commercial property uses. Applying the Michigan DEQ DCC and PSIC criteria outlined in the above table, the representative "true concentration" for each compound is less than the more applicable comparison criteria. As a result, the SVOC content of the construction soils located in Source Area B is not considered to pose a significant environmental impact or health risk to Site workers which would warrant the off-site disposal of excavated construction soils.

A review of the VOC data provided by ARCADIS did not indicate any individual data point that exceeded a NYSDEC TAGM 4046 Recommended Soil Cleanup Guidance Value. Therefore no statistical evaluation was performed on the VOC component of the Source Area B soils.

A review of Table 6, 7 and 8 identified several total metals to be present in the soil samples collected at the site. To re-iterate, the site geology identifies the fill materials at the site to be comprised of ash and cinders (likely from the facility fire), in addition to silt, gravel, brick, and concrete. The metals detected in the soil samples are consistent with the property's historical uses and a substantial structural fire. The following table summarizes the statistical analysis of the laboratory data for detected total metals.

Table 4.1.4-3 Area B Total Metals Statistical Analysis

Data Component	No. of Data Points	95% UCL (ppb)	Mean (ppb)	95% LCL (ppb)	Comparison Criteria (ppm)					
					NYSDEC TAGM 4046	NYSDEC Eastern USA Background[1]	USGS Background	EPA Background	MDEQ Industrial DCC	MDEQ Industrial PSIC
Arsenic	36	15.6	11.2	6.8	7.5	Range=3-12*	Range=ND-97	Range=1-50	61	910
Barium	36	233.8	202.3	170.7	300 or SB	Range=15-600	Range=10-5000	Range=100-3000	250,000	150,000
Beryllium	22	1.4	1.2	0.9	0.16 or SB	Range=ND-1.75	Range=ND-15	Range=0.1-40	3,100	590
Cadmium	36	0.7	0.5	0.3	1 or SB	Range=0.1-1	Range=0.01-0.7	Range=0.01-0.7	4,100	2,200
Chromium	36	35.6	29.0	22.4	10 or SB	Range=1.5-40*	Range=1-2000	Range=1-1000	1,000,000	240
Copper	22	138.8	88.4	38.0	25 or SB	Range=1-50	Range=ND-700	Range=2-100	140,000	59,000
Iron **	22	32,150.4	25,398.2	18,646.0	2,000 or SB	Range=2,000-5,000	Range=100->100,000	Range=NA	1,000,000	ID
Lead	36	121.6	75.3	28.9	200-500	Range=4-500	Range=ND-700	Range=2-200	900	44,000
Mercury	36	0.1	0.1	0.1	0.1	Range=0.001-0.2	Range=ND-4.6	Range=0.01-0.3	1,100	ID
Nickel	22	33.1	24.8	16.5	13 or SB	Range=0.5-25	Range=ND-700	Range=5-500	270,000	16,000
Selenium	36	1.4	1.1	0.9	2 or SB	Range=0.1-3.9	Range=ND-4.3	Range=0.1-2	18,000	59,000
Zinc	22	215.4	155.0	94.5	20 or SB	Range=9-50	Range=ND-2,900	Range=10-300	1,000,000	1,000,000

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg
* = Considered Background for NYS
1 = Taken from NYSDEC TAGM 4046

95% LCL = 95 % Lower Confidence Limit
SB = Site Background
** = Eastern USA Range=2,000-550,000 ppm (TAGM 4046)

A review of the statistical data indicates that several metals had mean concentrations greater than the TAGM residential cleanup criteria. Those metals are arsenic, beryllium, chromium, copper, iron, nickel, and zinc. The Source Area B, as well as the former foundry where the construction soils would be re-used is an industrial manufacturing area that has also experienced a substantial structural fire in 1983. A comparison of the "true concentrations" or means for the identified metals to the USGS and EPA cited background ranges in soils for those compounds indicates that the "true concentrations" fall well within the background range. In the absence of established site-specific background data, it is applicable to evaluate the site based on its future use (i.e., industrial) and to evaluate that the 95% probability of the identified metals "true concentrations" fall well within published ranges of background levels. Considering the industrial use of the area, the representative concentration or mean for the area is indicative of the background concentration for these metals in this industrial setting.

In addition to evaluating the "true concentrations" to the published background ranges, it would also be applicable to compare the statistical mean to an industrial cleanup standard as opposed to a residential standard (TAGM 4046). New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial property uses. Applying the Michigan DEQ DCC and PSIC criteria outlined in the above table, the representative "true concentration" for each compound is less than the more applicable comparison criteria (MDEQ DCC & PSIC).

In addition, a review of the 95% probability range indicates that for all of the identified metals, the 95% probability range is several orders of magnitude less than the MDEQ DC and PSI criteria. Based on the statistical evaluation, the metals content of the construction soils located in Source Area B is not considered to pose a significant environmental impact or health risk which would warrant the off-site disposal of excavated construction soils and therefore they would be appropriate for re-use at the Site.

4.1.5 SOURCE AREA "C"

As indicated previously, Source Area C is comprised of the remaining property located at 344 Vulcan street and the property surrounding Plant 5, including Plant 5. The property at 344 Vulcan Street has historically been utilized for light to moderate industrial manufacturing. The property surrounding GMPTG Plant 5, including Plant 5 (280 Vulcan Street) has also been historically utilized for light to moderate industrial manufacturing similar to the activities conducted at 344 Vulcan Street. Excavation materials will be generated in Source Area C as a result of the construction of various footers, utilities, and facility structures necessary for the construction of the new Inline 4/5 manufacturing facility. It is expected, as a result of the construction activities, that approximately 30,000 to 45,000 cubic yards of geotechnically unsuitable soil material will be generated.

Tables 9, 10, 11, 12, 13, and 14 outline the results of the subsurface investigations completed at the Plant 5 property located at 280 Vulcan Street. The investigation results for Tables 9 through 14 were provided by CRA. With regards to the statistical evaluation of the remaining property at 344 Vulcan Street, the data for this area was statistically evaluated and presented in section 4.1.2 Source Area B. The results of the evaluation indicated that the construction soil materials were suitable to be re-used at the former foundry for the re-grading of the area. Tables 9, 10, 11, 12, 13, and 14 summarize a more comprehensive list of constituents, including PCBs, RCRA Metals, VOCs, and SVOCs.

A review of data presented in the Tables 9 through 14 indicates that a combined 22 soil samples were collected for PCB analysis. The following table summarizes the statistical analysis of the laboratory PCB data.

Table 4.1.5-1 Area C PCB Statistical Analysis

Data Component	95% LCL	Mean	95% UCL	Comparison Criteria
				NYSDEC TAGM 4046
Laboratory Data (22 pts)	0.05 ppm	0.15 ppm	0.25 ppm	10 ppm

95% UCL = 95 % Upper confidence Limit
95% LCL = 95 % Lower Confidence Limit
ppm = parts per million or mg/kg

Utilizing the mean concentration as the "true PCB concentration" for Source Area C, it is apparent that the representative laboratory PCB concentration for Source Area C, as a whole, would be 0.15 mg/kg which is below the NYSDEC TAGM Guidance Criteria. The statistical evaluation also indicates that when Source Area C is evaluated as a whole, the 95% probability of a detectable PCB level would result in a laboratory concentration between 0.05 mg/kg and 0.25 mg/kg.

A review of Table 9 through 14 identified several semi-volatile organic compounds (SVOCs) to be present in the soil samples collected at the site. The site geology identifies the fill materials at the site to be comprised of some ash and cinders, in addition to silt, gravel, brick, and concrete. The SVOCs detected in the samples are common by-products of combustion, as well as the use of petroleum products, and are most probably the result of the 1983 fire and the facility's continual use of lubricating petroleum products. The following table summarizes the statistical analysis of the laboratory SVOC data.

Table 4.1.5-2 Area C SVOC Statistical Analysis

Data Component	No. of Data Points	95% UCL (ppb)	Mean (ppb)	95% LCL (ppb)	Comparison Criteria (ppb)		
					NYSDEC TAGM 4046	MDEQ Industrial DCC	MDEQ Industrial PSIC
Acenaphthene	29	9053.4	5036.4	1019.3	50,000	200,000,000	6,200,000,000
Anthracene	29	12813.4	6814.7	815.9	50,000	1,000,000,000	29,000,000,000
Benzo(a)anthracene	29	12837.4	7322.8	1808.2	330 (MDL)	100,000	ID
Benzo(a)pyrene	29	10193.7	5820.1	1446.5	330 (MDL)	10,000	1,900,000
Benzo(b)fluoranthene	29	16207.7	8813.8	1419.9	1,100	100,000	ID
Benzo(g,h,i)perylene	29	3234.3	2028.9	823.4	50,000	9,100,000	350,000,000
Benzo(k)fluoranthene	29	3831.3	2371.7	912.1	1,100	1,000,000	ID
Chrysene	29	11083.3	6132.7	1180.2	400	10,000,000	ID
Dibenzo(a,h)anthracene	29	1567.1	1113.3	659.5	330 (MDL)	10,000	ID
Fluoranthene	29	25388.2	14118.8	2849.4	50,000	180,000,000	4,100,000,000
Fluorene	29	10179.6	5735	1290.4	50,000	130,000,000	4,100,000,000
Indeno(1,2,3-cd)pyrene	29	3557.7	2182.8	807.8	3,200	100,000	ID
Phenanthrene	29	37855.3	20927.6	3999.8	50,000	8,000,000	2,900,000
Pyrene	29	23501.7	13314.7	3127.6	50,000	110,000,000	2,900,000,000

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg
95% LCL = 95 % Lower Confidence Limit
ID=Inadequate data to develop criterion

A review of the statistical evaluation indicates that six means or "true concentrations" exceed the residential TAGM 4046 guidance criteria. The Source Area C, as well as the former foundry where the construction soils would be re-used, is an industrial manufacturing area. As a result, the comparison of the statistical mean to a generic risk-based criteria as opposed to a residential standard, such as the NYSDEC TAGM 4046, would be more appropriate. New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial property uses. Applying the Michigan DEQ DCC and PSIC criteria outlined in the above table, the representative "true concentration" for each compound is several orders of magnitude less than the more applicable generic risk-based comparison criteria. As a result, the SVOC content of the construction soils located in Source Area C is not considered to pose a significant environmental impact or health risk which would warrant the off-site disposal of excavated construction soils and are therefore suitable for reuse at the Site.

A review of Table 9 through 14 identified several volatile organic compounds to be present in the soil samples collected at the site. The site geology identifies the fill materials at the site to be comprised of some ash and cinders (likely from the facility fire), in addition to silt, gravel, brick, and concrete. The VOCs detected in the samples are common components of petroleum products, and are most probably the result of the facility's continual use of lubricating petroleum products. The following table summarizes the statistical analysis of the laboratory VOC data.

Table 4.1.5-3 Area C VOC Statistical Analysis

Data Component	No. of Data Points	95% UCL (ppb)	Mean (ppb)	95% LCL (ppb)	Comparison Criteria (ppb)		
					NYSDEC TAGM 4046	MDEQ Industrial DCC	MDEQ Industrial PSIC
1,2,4-Trimethylbenzene	29	5664.5	2567.6	ND	NA	1,100,000	36,000,000,000
1,3,5-Trimethylbenzene	29	541.6	327.3	113.1	NA	94,000	36,000,000,000
Benzene	29	203.8	106.8	9.9	60	400,000	470,000,000
Ethylbenzene	29	270.7	152.7	34.6	5,500	140,000	29,000,000,000
Isopropylbenzene	29	231.2	122.5	13.8	NA	390,000	2,600,000,000
m-Xylene	29	834.3	423.6	12.9	1,200	150,000	130,000,000,000
Naphthalene	29	3639.0	2116.2	593.3	13,000	80,000,000	88,000,000
n-Butylbenzene	29	4777.0	2547.9	318.7	NA	10,000,000	ID
n-Propylbenzene	29	270.1	157.0	43.9	14,000	10,000,000	590,000,000
o-Xylene	29	98.5	62.9	27.4	1,200	150,000	130,000,000,000
p-Isopropyltoluene	29	59.1	41.6	24.0	NA	NA	NA
p-Xylene	19	51.6	7.3	2.9	1,200	150,000	130,000,000,000
sec-Butylbenzene	29	2046.0	1109.9	173.8	NA	10,000,000	ID
tert Butylbenzene	29	86.8	56.3	25.7	NA	10,000,000	ID
Toluene	29	96.3	64.3	32.3	1,500	250,000	120,000,000
Total Xylenes	29	850.7	437.7	24.8	1,200	150,000	130,000,000,000

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg
NA=Not Available
95% LCL = 95 % Lower Confidence Limit
ID=Inadequate data to develop criterion

A review of the statistical evaluation indicates that benzene had a "true concentration" (mean) greater than the available NYSDEC TAGM 4046 residential guidance criteria. The Source Area C, as well as the former foundry where the construction soils would be re-used is an industrial manufacturing area. Therefore it would be more applicable to compare the statistical mean for the identified compounds, including benzene, to an industrial cleanup standard as opposed to a residential standard. New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial property uses. Applying the Michigan DEQ DCC and PSIC, the representative "true concentrations" for the above detected compounds are several orders of magnitude less than the more applicable comparison criteria (MDEQ DCC and PSIC). As a result, the VOC content of the construction soils located in Source Area C is not considered to pose a significant environmental impact or health risk which would warrant the off-site disposal of excavated construction soils and are therefore suitable for reuse at the Site.

A review of Table 9 through 14 identified several total metals to be present in the soil samples collected at the site. To re-iterate, the site geology identifies the fill materials at the site to be comprised of some ash and cinders (likely from the facility fire), in addition to silt, gravel, brick, and concrete. The metals detected in the soil samples are consistent with the property's historical uses. The following table summarizes the statistical analysis of the laboratory metals data.

Table 4.1.5-4 Area C Total Metals Statistical Analysis

Data Component	No. of Data Points	95% UCL (ppb)	Mean (ppb)	95% LCL (ppb)	Comparison Criteria (ppm)					
					NYSDEC TAGM 4046	NYSDEC Eastern USA Background[1]	USGS Background	EPA Background	MDEQ Industrial DCC	MDEQ Industrial PSIC
Arsenic	17	6.5	5.21	3.9	7.5 or SB	Range=3-12*	Range=ND-97	Range=1-50	61	910
Barium	17	203	165.1	127.2	300 or SB	Range=15-600	Range=10-5000	Range=100-3000	250,000	150,000
Cadmium	17	0.4	0.4	0.3	1 or SB	Range=0.1-1	Range=0.01-0.7	Range=0.01-0.7	4,100	2,200
Chromium	17	22.5	18.7	14.9	10 or SB	Range=1.5-40*	Range=1-2000	Range=1-1000	1,000,000	240
Lead	17	19.4	14.9	10.3	200-500	Range=4-500	Range=ND-700	Range=2-200	900	ID
Mercury	17	0.3	0.2	0.1	0.1	Range=0.001-0.2	Range=ND-4.6	Range=0.01-0.3	1,100	ID
Selenium	17	2.0	1.7	1.5	2 or SB	Range=0.1-3.9	Range=ND-4.3	Range=0.1-2	16,000	59,000
Silver	17	0.6	0.6	0.6	20 or SB	NA	Range=ND-2,900	Range=10-300	17,000	2,900

95% UCL = 95 % Upper confidence Limit
ppb = parts per billion or ug/kg
1=Taken from NYSDEC TAGM 4046

95% LCL = 95 % Lower Confidence Limit
SB = Site Background

A review of the statistical data indicates that several metals had mean concentrations greater than the TAGM residential cleanup criteria. Those metals are chromium and mercury. The Source Area C, as well as the former foundry where the construction soils would be re-used is an industrial manufacturing area. A comparison of the "true concentrations" or means for the identified metals to the USGS and EPA cited background ranges in soils for those compounds indicates that the "true concentrations" fall well within the background range. In the absence of established site-specific background data, it is applicable to evaluate the site based on its future use (i.e., industrial) and to evaluate that the 95% probability of the identified metals "true concentrations" fall well within published ranges of background levels. Considering the industrial use of the area, the representative concentration or mean for the area is indicative of the background concentration for these metals in this industrial setting.

In addition to evaluating the "true concentrations" to the published background ranges, it would also be applicable to compare the statistical mean to an industrial cleanup standard as opposed to a residential standard (TAGM 4046). New York State does not have an industrial cleanup standard, however, the Michigan DEQ has established cleanup standards or direct contact criteria (DCC) and particulate soil inhalation criteria (PSIC) for industrial property uses. Applying the Michigan DEQ DCC and PSIC criteria the representative "true concentrations" (statistical means) for the identified metals are several orders of magnitude less than the more applicable comparison criteria.

Based on the statistical evaluation, the metals content of the construction soils located in Source Area C is not considered to pose a significant environmental impact or health risk which would warrant the off-site disposal of excavated construction soils and are therefore suitable for reuse at the Site.

GM has also identified two additional areas located within Source Area C that the potential for the presence of residual petroleum products exist. At this time it is unclear as to whether any soil materials from these areas will require off-Site disposal at an approved local landfill. These areas have been identified as Area C-1 and Area C-2. Area C-1 is a former underground storage tank area (UST) located north of Plant 5. Area C-2 is identified as the "surface" soils lying beneath the concrete pads located in the chip management areas (north and northwest of Plant 5) that have been potentially saturated with petroleum products. Figure 6 identifies the locations of Area C-1 and Area C-2.

Area C-1 is a former UST location and currently has a NYSDEC Spill number (NYSDEC Spill #0075187) associated with the area. A NYSDEC Spill number was assigned as a result of the presence of residual petroleum products identified during a historical subsurface investigation. As a result of the classification of this area as a registered NYSDEC spill, soils that are encountered during the construction activities from this area will need to be properly managed on-site, specifically, excavated, placed on and covered with visqueen, characterized, and then a determination will be made as to the final disposition of the material (i.e., should the laboratory data indicate that the material is consistent with existing Site soils, the staged soils will be re-used at the Site for re-grading otherwise the material would be sent to an off-Site landfill).

Area C-2 are those soils located beneath the areas utilized for the management of grinding chips and SWARF material. Based on the historical assessment data available to GM, it is anticipated that a portion of the surficial soils located beneath the concrete management pads will be impacted with petroleum products inconsistent with the re-use criteria and "true concentrations" previously identified for Source Area C. As such, GM will manage these materials appropriately for off-site disposal.

Materials emanating from Areas A-2, C-1 and C-2 which require off-site disposal will be managed and staged on visqueen at a designated location at 344 Vulcan Street.

4.2 HUMAN IMPACT

Based on the laboratory data, the human health impact of re-using the materials is limited since the exposure would be limited to construction workers excavating, transporting, and re-grading the soil materials. Once the material has been re-graded, it is GM's intention to cover the material with 6 inches of topsoil, hydro-seed the area, and maintain the area as a green-space. Surface water run-off from the area will be negligible since it will be directed to towards the eastern edge of the property..

Prior to the commencement of grading activities, all available laboratory data will be provided to the contractors and each contractor will be required to prepare a Health and Safety Plan (HASP) as required under OSHA regulations. With the use of proper personal protective equipment as defined in the contractors HASP, such as gloves and safety glasses, construction worker exposure to the materials will be further reduced.

To re-iterate, the statistical evaluation of each Source Area indicated that the "true concentrations" for compounds identified within each Source Area were either less than the residential NYSDEC recommended soil cleanup criteria (TAGM 4046) or the MDEQ direct contact criteria and particulate soil inhalation criteria (which is protective of industrial workers and construction workers health). During the actual grading activities, Site occupant exposure will be minimized by fencing-off work areas to restrict access only to authorized personnel. Once the area has been re-graded and covered with topsoil, any potential health risk to the occupants of the site that may have existed will be reduced or eliminated. The soils would not pose an environmental impact or health risk to the general public since the materials will be excavated, transported, re-graded and covered all within the internal fenced boundaries of the GMPTG property.

In summary, based on the analytical results and the proposed re-use of the excavation materials, it does not appear that the construction excavation soils will pose a significant health risk to workers, the public, or the environment. As such GM intends to re-use the construction excavation soils from the three Source Areas for backfilling and re-grading purposes at the 15-acrea parcel based on the exemptions (pre-determined BUDs) outlined in the beneficial use regulations found in 6NYCRR Part 360 1.15(b)(7) and (8).

5.0 SOILS MANAGEMENT

The following is in addition to any existing Soils Management Plan that General Motors may have at the facility and is specific to the materials proposed in this Soils Management Plan.

The sources of the construction soils are as follows:

1. Source Area A
   The rail line ROW located on the south property line of the AAM facility. Construction soils generated from this area will be the result of the installation of a 28-foot wide by 2,100 linear foot long access roadway to be maintained by the Town of Tonawanda. Also identified during preliminary assessments of the area were three waste debris (i.e., railroad ties, trees, etc.) that the ECIDA will dispose of at an off-site secure landfill. In addition to the construction of a new access roadway, the potential relocation of a rail line will also occur, however negligible amounts, if any, of construction soils will be generated as a result of this activity.

2. Source Area B
   A 4.5-acre parcel of land located on the north end of the property located at 344 Vulcan Street. Construction soils will be generated as a result of the construction of a new Utility Services Plant, which will support manufacturing operations at the new Inline 4/5 manufacturing facility.

3. Source Area C
   Source Area C is comprised of the remaining 7.5 acres at the 344 Vulcan Street property as well as the adjacent GMPTG Plant 5 area. Construction soils will be generated as a result of the construction a new 750,000 square foot manufacturing facility.

Approximately 40,000 to 65,000 cubic yards of construction excavation soils will be generated as a result of the various construction activities. Under no circumstances will construction and demolition (C&D) debris and materials considered refuse, specifically steel, wood, plastic, railroad ties, or other miscellaneous debris be transported and re-used as grading material at the 15 acre-parcel of vacant property located on the northeast corner of Plant 4. These materials will be required to be sent off-site for disposal. However, provided the contractors performing the construction activities can provide concrete and brick crushed into manageable portions (less than 8 inches square), as well as inert materials such as railroad ballast and pavement sub-base, a portion of these materials can be re-used, as outlined in the Part 360 exemptions, to fill void spaces at the 15-acre parcel. As indicated earlier, grading design detail drawings and SOPs, has been provided as Appendix A and Attachment 1, respectively, outlining the planned final grades and project procedures. The grading design details have the flexibility to adjust to the actual soil quantities and the types of materials (e.g., concrete, brick, railroad ballast, etc.) provided. Any available inert materials will be placed as the first lift in the grading activities and then covered with granular materials. Inert materials will be limited to items such as concrete less than 8 inches square, railroad ballast materials, and crushed brick while C&D materials such as railroad ties, large pieces (greater than 8 inches square) of concrete, steel, plastic, and miscellaneous wood materials will be sent off-site for disposal.

Since it is difficult to anticipate and identify all potential environmental issues associated with an area this large in which construction soils will be generated from, CRA will visually monitor excavation materials to ensure that they are consistent with soils encountered during previous investigations and presented in this document. Should suspect materials not consistent with what has been identified during previous investigations be encountered during site construction activities, the materials will be segregated and placed on visqueen and sampled for re-evaluation. Should the laboratory results indicate that the materials are consistent with the materials identified during previous investigations, the materials will be transported to the 15-acre parcel for use. However, should the laboratory results indicate that the material is not suitable for re-use at the re-grading project, it will be the responsibility of the construction contractor(s), with the aid of CRA (GM's environmental consultant), to ensure that the materials are properly managed and sent to an approved off-site disposal facility.

Once the construction soils have been excavated and de-watered, if necessary, they will be transported by truck from the Source Areas via the designated haul routes identified in Figure 9. It is GMs intention that no transport vehicles will move excavated soil materials from the Source Areas via public highways. It should be noted that during the period from July 23rd through August 20th, it is anticipated that a temporary haul route through the former foundry area (running north to south) may be necessary in order to accommodate construction activities for the Inline 4/5 project (the existing north-south roadway may be closed due to overhead trestle work).

It will be the responsibility of the construction contractors to de-water saturated granular fill materials prior to loading the materials into trucks for transport to the 15-acre parcel for re-use in re-grading the area. Typically, de-watering of excavation areas are accomplished through the use of mechanical pumps. Water is pumped from the excavation onto the nearby ground at a point usually 40 feet or greater from the excavation.

Based on conversations with the NYSDEC Region 9 Division of Water, GM has modified this standard construction practice with the addition of either manufactured filter canisters or engineered filtration for the removal of general runoff sediments.

For those areas previously identified by GM as potential PCB containing areas, waters will be removed from excavation areas using mechanical pumps. The water will then be both engineered and manufactured filter systems. Once the water has passed through the filtration mechanisms, it will be discharged upon the ground. The basis for this additional preventive measure is the Filtration Study Report prepared by CRA (November 7, 2000) in which it was identified that PCB materials for the facility were associated with site sediments and not oils. (On May 17, 2001, the NYSDEC was contacted and this approach discussed and was agreed to). Should it be necessary to discharge excavation waters from potential PCB containing areas to a Facility storm sewer, the waters will be filtered and treated through an activated carbon system per the Facility's SPDES permit. SOP No. 1 (attached) outlines the details of the engineered filter system, manufactured filter system, and the activated carbon system.

In those areas where PCBs are not an issue, excavation waters will be either pumped onto the surrounding ground or, only after passing through an engineered or manufactured filter mechanism, to the GM Tonawanda Outfall 001. When excavation waters (e.g., rainwater and perched water) cannot be pumped to a manhole located on the Outfall 001 storm sewer system, the water will pumped directly to the ground some distance from the excavation area. When excavation waters can be pumped to an Outfall 001 manhole, the waters will be first pumped through either an engineered or manufactured filter mechanism and then into the facility storm sewer. SOP No. 1 (attached) outlines the details of the engineered and manufactured filter systems.

In the event, that pumping the excavation cannot maintain a "dry" excavation scenario, de-watering of saturated soil material can also be accomplished by excavating the saturated materials and placing them on the ground adjacent to the excavation and allowing the water to gravity drain from the materials back into the excavation. Saturated excavation soils will not be stockpiled for dewatering purposes within 50 feet of site storm sewers.

It will be the requirement of the construction contractors performing the excavation activities to control dust through appropriate means as on any construction project, such as through the use of a water truck and spray to reduce fugitive dust emissions and maintaining clean access roads through the use of sweepers. The excavated soils will be transported to the 15-acre parcel where they will be graded into place immediately. The grading contractor will control soil erosion from the soil management area and along the haul routes through the use of silt fences, hay bale barriers, and dust suppression with water (Refer to attached SOPs for deatails).

For those areas previously identified as requiring off-site disposal (potentially Area A-1, Area A-2, Area C-1, and Area C-2), GM will manage these materials on site as required. The preferred method of management will be to pre-characterize materials for off-site disposal prior to excavation. Once the materials have been pre-characterized and approved for off-site disposal, the soils would be excavated and directly loaded into appropriate waste containers for immediate shipment to the designated disposal facility. Should construction scheduling conflicts arise that would preclude pre-characterization of the materials and direct loading, at a minimum, the materials will be temporarily staged on visqueen adjacent to the excavation, if possible, otherwise at a designated location at 344 Vulcan Street (the Inline 4/5 Expansion construction site). Once staged, the materials will be sampled for characterization, covered with visqueen to prevent surface water run-off, and ultimately loaded into proper disposal containers and transported to an appropriate off-site landfill facility. Until actual excavation activities begin, it is difficult to estimate the actual quantity of materials from the three areas requiring off-site disposal. Assuming a removal depth of approximately 3 feet, it is estimated that the combined potential volume of suspect materials that could be generated could be as great as 1,500 to 2,500 cubic yards of soil.

6.0 GRADING SUMMARY

This section summarizes the grading of 15-acre parcel formerly known as a portion of the DuPont Landfill (previously delisted). Grading details (drawings) and SOPs are provided as Appendix A and Attachment 1, respectively. The SOPs include details for management of construction waters, temporary soil erosion and sediment control, dust control, traffic control, excavation of source area soils, placement of fill materials, placement of topsoil, and seeding and hydroseeding. The grading designs for the designated soil management areas have been developed with a degree of flexability to accommodate actual volumes of re-utilized soils and Plant needs.

During the soil management and grading project, several parties will be involved with the implementation and completion of the project. There will be several excavation contractors; Nichols Long and Moore for the Inline 4/5 Construction Project who will be supervised by The Washington Group, Pinto Construction who will be supervised by URS Greiner for the DTE Energy Services Project, and the ECIDA Access Roadway contractor is yet to be determined. The soils management contractor will be supervised by CRA. The soil management contractor will be responsible for grading activities, dust control along haul routes, and sediment and erosion control at soil management areas and along haul routes. It will be the responsibility of the excavation contractor to transport soils to the management areas, dust control at the excavation area and erosion control at the excavation areas.

6.1 LANDFILL GRADING

The 15-acre parcel, also known as the former DuPont Landfill is recommended to be utilized for the re-use of excavation soils. Re-grading the former landfill area will eliminate unwanted drainage from the landfill to the railroad drainage swale and off-site to surrounding properties.

The design plans have been developed to be flexible in order to accommodate the Plant's needs and actual soil quantities. If all of the estimated 65,000 cubic yards (maximum) of material is re-used at the landfill area, the final grade elevation would be approximately 2.5 to 3.0 feet above surrounding grade, assuming the 15-acre parcel is flat. The current topography of the landfill is sloping grade radiating out from the center of the property (hence the necessity to re-grade to prevent run-of onto surrounding properties). Prior to placement of additional fill, the landfill surface will be cleared and grubbed, and leveled in preparation for fill placement. The final configuration of the landfill will have a slightly sloping grade to the east while the perimeter will have a 4 on 1 sloping berm.

Located along the southeast corner of the area is a parking lot. In the event of a severe rain occurrence which could potentially produce excessive surface run-off from the 15-acre area, a drainage swale will be constructed to prevent the run-off from flowing across the parking lot and entering Site storm sewers. The drainage swale will extend from the southeast corner of the 15-acre parcel and extend northward to the northwest corner of the parking lot. At the corner, the drainage swale will turn to the east and extend eastward to the easternmost edge of the 15-acre parcel. The drainage swale will have a 4 on 1 slope at the southeast and eastern corners down to an approximate depth of 1.5 feet. Once the desired depth has been reached, the ditch will extend to the west from the eastern corner and to the north from the southeastern corner at a level slope. The swale is designed to collect any residual surface run-off during severe rain events that is not managed through evapo-transpiration of the surface grasses located along the flat 15-acre parcel. The 15-acre parcel will be covered with a 6-inch lift of topsoil and hydroseeded with grass, while the perimeter berm will be seeded with crownvetch.

7.0 CONCLUSION

GM is preparing this SMP to support the environmental component of an overall plan designed to re-use non-hazardous granular fill that will be generated during construction activities associated with the GM Inline 4/5 Plant Expansion Project. As an added benefit, this project will be used to re-grade the 15-acre parcel formerly known as (a portion of) the DuPont Landfill in order to minimize surface run-off which may carry sediments from this area into a nearby drainage swale that is indirectly connected to the facility storm sewer system.

Therefore the soils generated during construction will be used to re-grade the 15-acre parcel based on the pre-determined BUD exemptions outlined under Title 6, New York Codes, Rules, Regulations, Part 360, Section 1.15 Beneficial Use (6 NYCRR Part 360-1.15). GM intends to re-use an estimated 40,000 to 65,000 cubic yards of excavated soils generated from the construction of building footers and utilities, parking lots, and access roadways for re-grading and seeding of the 15-acre parcel.

Grading design details and SOPs are included as Appendix A and Attachemnt 1 which include details required to re-grade the 15-acre area. The grading design details include procedures required to implement the re-grading of the designated area and illustrates elevations and physical features of the final product. The issue of enhanced water movement through the 15-acrearea as a consequence of adding soil to this area has been examined. The grading design does not call for the introduction of additional sources of water to the area. Currently, surface water run-off from the area is negligible and as such, waters that are being introduced to the 15-acre area are dissipating via percolation into the subsurface soils or through evaporation to the atmosphere. Based upon the grading design details, the additional soils placed on the area would re-direct surface waters that normally fall upon the area to the east (the slope across the area will be 0.5 feet over 645 feet), preventing surface waters from leaving the area. The grading design details also call for the planting of grassed that would increase evapo-transpiration (uptake through roots and transpiration out from leaves), thereby reducing infiltration of surface water into the subsurface. Waters not lost to evaporation and evapo-transpiration will be easily accommodated by the absorptive capacity of the additional soils as well as the existing soils. In addition, the re-grading will also eliminate the small potential of surface runoff to the nearby railroad drainage swale which is indirectly connected to the Sites storm sewer system

The environmental benefit to re-use an estimated 40,000 to 65,000 cubic yards of excavated soils generated from the construction of building footers and utilities, parking lots, and access roadways for re-grading and seeding of the 15-acre parcel commonly

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referred to as the former DuPont Landfill area is significant. The grading design details proposes to re-grade the 15-acre parcel to allow for surface water run-off towards the east, thereby eliminating surface water run-off from the area. The re-use of the construction soils would facilitate the completion of the re-grading of the former Landfill area by providing sufficient "raw materials" to re-grade these areas immediately and thus providing an immediate positive benefit.

In addition to providing an on-site environmental benefit, the re-grading of the 15-acre parcel utilizing construction soils (unsuitable for construction requirements) would reduce the amount of "clean" fill material requiring off-site disposal at local landfills. The re-use of the construction soils would promote the conservation of limited landfill space, which could be better utilized for non-reusable materials. The statistical analysis and discussion presented in the previous sections indicate that the reuse of these soils do not pose an environmental or health risk to the Site, Plant employees, or construction workers.

The economic benefit of re-using the construction excavation soils at the 15-acre parcel would be realized on several levels by various entities. Based on a $25.00 per ton cost for transportation and disposal of the excavated materials to a local non-hazardous solid waste landfill, the combined cost to dispose of the excavated materials from the three Source Areas would range from $1.5M to $2.4375M for 40,000 to 65,000 cubic yards (60,000 to 97,500 tons), respectively. These cost savings would be realized by GM, the ECIDA, the State of New York, and DTE Energy Services. In addition to a cost savings associated with not disposing of materials at an off-site facility, GM would also realize an additional cost savings since "clean fill" material to re-grade the 15-acre parcel would not need to be purchased. The average transportation and per ton costs for fill material is approximately $25 per ton. Assuming the need for approximately 30,000 cubic yards of fill material to properly re-grade the 15-acre parcel, the purchase cost of the material would be $1.125 M. It is also estimated that the expense to re-use the materials on-site and create a "green-space" would be approximately $350,000 to $500,000 per area.

The following table outlines the gross expenses and savings that could be realized through the re-use of construction soils.

Project Entity	**COSTS**	
	Savings	**Expenses**
ECIDA/NYS	$187,500 - $375,000	---
DTE Energy Services/GM	$187,500 - $375,000	---
GM – Disposal	$1,125,000 - $1,687,500	---
GM – Former Landfill Grading	$1,125,000	$350,000 - $500,000
Net Savings/Expense	$2,625,000-$3,562,500	$350,000-$500,000

This is a cost savings ranging from $2.625 M to $ 3.562 M.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SOIL DATA STATISTICAL ANALYSIS

SOURCE AREA A

Total PCBs (mg/kg)

n	s	95% LCL	Mean	95% UCL
23	4.95	0.20	1.98	3.75

Notes:
1. There are no exceedances of the LCL, mean, or UCL.

PCB Field Screening (ppm)

n	s	95% LCL	Mean	95% UCL
144	11.95	4.49	6.17	7.86

Notes:
1. There are no exceedances of the LCL, mean, or UCL.

Mercury (mg/kg)

n	s	95% LCL	Mean	95% UCL
7	0.20	-0.02	0.13	0.28

Notes:
1. The mean still exceeds the TAGM recommended cleanup criteria of 0.1 mg/kg. However, this is based on a residential property use standard. A more relavant criteria would be the Michigan Generic Cleanup Criteria for Industrial and Commercial property uses. The most stringent criteria would be for GW protection (gw/sw interface protection criteria) at 0.17 mg/kg. As far as protection of human health, , the most stringent criteria would be for direct contact at 1400 mg/kg.
2. Furthermore, there was only one detection at an elevated detection limit. Therefore, the elevated mean is not representative.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SOIL DATA STATISTICAL ANALYSIS

SOURCE AREA B

VOCs

No individual data point exceeded a TAGM recommended soil cleanup guidance value, therefore statistical analysis not completed.

SVOCs

	TAGM (ug/kg)	MDEQ Industrial DCC (ug/kg)	n	s	95% LCL		Mean		95% UCL	
Anthracene	50000	1000000000	22	365.14	131.56		265.45		399.35	
Benzo(a)anthracene	330 (MDL)	210000	22	739.27	270.38		541.48	*	812.57	*
Benzo(b)fluoranthene	1100	210000	22	1029.60	324.37		701.93		1079.49	
Benzo(k)fluoranthene	1100	2100000	22	134.81	147.61		197.05		246.48	
Benzo(g,h,I)perylene	50000	16000000	22	119.93	186.34		230.32		274.30	
Benzo(a)pyrene	61	21000	22	556.47	247.12	*	451.18	*	655.24	*
Benzoic acid	2700	1000000000	22	1257.42	609.35		1070.45		1531.56	
Chrysene	600	21000000	22	675.15	292.78		540.36		787.94	*
Dibenzofuran	6200		22	93.68	183.92		218.27		252.63	
Fluoranthene	50000	540000000	22	1686.26	464.64		1083.00		1701.36	
Fluorene	50000	540000000	22	132.94	200.57		249.32		298.07	
Indeno(1,2,3-cd)pyrene	3200	210000	22	159.34	203.30		261.73		320.16	
Phenanthrene	50000	16000000	22	1479.55	313.80		856.36		1398.92	
Pyrene	50000	340000000	22	1421.25	507.27		1028.45		1549.64	

Notes:
1. The only LCL that exceeds the TAGM standards is that for benzo(a)pyrene. The standard is very low when compared to other SVOCs. The MDEQ DCC for industrial sites is significantly higher and more representative.
2. The mean exceeds TAGM for benzo(a)anthracene and benzo(a)pyrene, but does not exceed MDEQ DCC.
3. The UCL exceeds TAGM for benzo(a)anthracene, benzo(a) pyrene, and chrysene. No UCLs exceed the MDEQ DCC.
4. The EMCON SVOC data from 10/99 was not used in the evaluation since the detection limits provided by the lab exceeded the TAGM guidance values even for non-detects. Calculation resulted in negative values for the LCL.

Total PCBs (mg/kg)

n	s	95% LCL	Mean	95% UCL
32	0.26	0.02	0.10	0.18

Notes:
1. There are no exceedances of the LCL, mean, or UCL.

PCB Field Screening (ppm)

n	s	95% LCL	Mean	95% UCL
25	1.22	0.98	1.40	1.82

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SOIL DATA STATISTICAL ANALYSIS

Notes:

1. There are no exceedances of the LCL, mean, or UCL.

Metals

	TAGM (mg/kg)	MDEQ Industrial DCC (mg/kg)	n	s	95% LCL		Mean		95% UCL	
Arsenic	7.5	100	36	15.61	6.84		11.24	*	15.64	*
Barium	300 or SB	320000	36	111.92	170.74		202.26		233.79	
Beryllium	0.16	23000	22	0.70	0.92	✓	1.17	✓	1.43	✓
Cadmium	1	2300	36	0.63	0.33		0.51		0.68	
Chromium	10	1000000	36	23.45	22.38	*	28.98	*	35.59	*
Copper	25 or SB	170000	22	137.50	37.97	✓	88.40	✓	138.82	✓
Iron	2000 or SB		22	18413.23	18645.96	✓	25398.18	✓	32150.41	✓
Lead	200 - 500	900	36	164.54	28.91		75.25		121.60	
Mercury	0.1	1400	36	0.11	0.08		0.11	*	0.14	*
Nickel	13 or SB	340000	22	22.68	16.45	✓	24.77	✓	33.08	✓
Selenium	2 or SB	23000	36	0.89	0.89		1.14		1.39	
Zinc	20 or SB	1000000	22	164.79	94.52	✓	154.95	✓	215.38	✓

Notes:

1. A check mark signifies non-RCRA metals. Although the LCL, mean, and/or UCL may exceed the TAGM, all values are bleow the MDEQ Industrial Property Use Direct Contact Criteria for protection of worker health.
2. An asterisk (*) signifies an exceedance of the TAGM guidance value.
3. With the exception of chromium, no RCRA metals had LCLs exceeding the TAGM guidance values.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SOIL DATA STATISTICAL ANALYSIS

SOURCE AREA C

VOCs

	TAGM (ug/kg)	MDEQ Industrial DCC (ug/kg)	n	s	95% LCL	Mean	95% UCL
1,2,4-Trimethylbenzene	13000	1100000	29	9640.20	-529.4	2567.58	5664.5
1,3,5-Trimethylbenzene	3300		29	666.92	113.1	327.30	541.6
Benzene	60	400000	29	301.89	9.9	106.84 *	203.8 *
Ethylbenzene	5500	140000	29	367.53	34.6	152.65	270.7
Isopropylbenzene	5000		29	338.34	13.8	122.53	231.2
m-Xylene			29	1278.53	12.9	423.59	834.3
Naphthalene	13000	160000000	29	4740.36	593.3	2116.15	3639.0
Naphthalene	13000	160000000	19	22902.54	-1686.1	7403.68	16493.4 *
n-Butylbenzene	18000		29	6938.93	318.7	2547.88	4777.0
n-Propylbenzene	14000		29	352.09	43.9	156.98	270.1
o-Xylene			29	110.65	27.4	62.91	98.5
p-Isopropyltoluene	11000		29	54.55	24.0	41.56	59.1
p-Xylene			19	61.34	2.9	27.28	51.6
sec-Butylbenzene	25000		29	2913.88	173.8	1109.89	2046.0
tert-Butylbenzene			29	94.98	25.7	56.26	86.8
Toluene	1500	250000	29	99.64	32.3	64.27	96.3
Total Xylenes	1200	150000	29	1285.34	24.8	437.74	850.7

Notes:
1. All LCLs were below TAGM.
2. All means were below TAGM with the exception of Benzene.
3. UCLs for benzene and naphthalene exceeded TAGM.
4. When compared to MDEQ Industrial DCC, there were no exceedances.
5. A negative value for the LCL is a result of an individual elevated detection resulting in a large standard deviation, thus skewing the LCL and UCL.

SVOCs

	TAGM (ug/kg)	MDEQ Industrial DCC (ug/kg)	n	s	95% LCL	Mean	95% UCL
Acenaphthene	50000	810000000	29	12725.04	1019.3	5036.38	9053.4
Anthracene	50000	1000000000	29	19002.44	815.9	6814.66	12813.4
Benzo(a)anthracene	224 or MDL	210000	29	17468.80	1808.2 *	7322.79 *	12837.4 *
Benzo(a)pyrene	61 or MDL	21000	29	13854.43	1446.5 *	5820.07 *	10193.7 *
Benzo(b)fluoranthene	1100	210000	29	23422.09	1419.9 *	8813.79 *	16207.7 *
Benzo(ghi)perylene	50000	16000000	29	3818.52	823.4	2028.86	3234.3
Benzo(k)fluoranthene	1100	2100000	29	4623.60	912.1	2371.69 *	3831.3 *
Chrysene	400	21000000	29	15685.18	1180.2 *	6131.72 *	11083.3 *
Dibenzo(a,h)anthracene	14 or MDL	21000	29	1437.57	659.5 *	1113.28 *	1567.1 *
Fluoranthene	50000	540000000	29	35698.49	2849.4	14118.79	25388.2
Fluorene	50000	540000000	29	14079.50	1290.4	5735.00	10179.6

Indeno(1,2,3-cd)pyrene	3200	210000	29	4355.59	807.8	2182.76	3557.7	*
Phenanthrene	50000	16000000	29	53622.80	3999.8	20927.59	37855.3	
Pyrene	50000	340000000	29	32270.10	3127.6	13314.66	23501.7	

Notes:
1. LCLs for benzo(a)anthracene, benzo(a)pyrene, enzo(b)fluoranthene,chrysene, and dibenzo(a,h)anthracene exceed TAGM. Detection limits exceeded TAGM to start.
2. Means for above plus benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene exceed TAGM. Detection limits exceeded TAGM guidance values in many cases.
3. UCLs for above plus indeno(1,2,3-c,d)pyrene exceed TAGM. Detection limits exceeded TAGM guidance values in many cases.
4. When compared to MDEQ Industrial DCC, there were no exceedances.

Total PCBs (ug/kg)

n	s	95% LCL	Mean	95% UCL
22	0.27	0.05	0.15	0.25

Notes:
1. There are no exceedances of the LCL, mean, or UCL.

Metals

	TAGM (mg/kg)	MDEQ Industrial DCC (mg/kg)	n	s	95% LCL		Mean		95% UCL	
Arsenic	7.5	100	17	3.09	3.90		5.21		6.52	
Barium	300	320000	17	89.28	127.19		165.08		202.98	
Cadmium	1	2300	17	0.14	0.30		0.36		0.42	
Chromium	10	1000000	17	9.01	14.86	*	18.69	*	22.51	*
Lead	500	900	17	10.81	10.27		14.86		19.44	
Mercury	0.1	1400	17	0.25	0.11		0.22	*	0.33	*
Selenium	2	23000	17	0.51	1.52		1.73		1.95	
Silver	No standard	No standard	17	0.04	0.60		0.62		0.63	

Notes:
1. LCL, mean, and UCL for chromium are above TAGM guidance value. Values well below MDEQ criteria.
2. Mean and UCL for mercury above TAGM. Most likely due to higher detection limits. LCL at TAGM.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	Results (mg/kg)
RR-008A	0.178
RR-233A	0.037
RR-251A	0.4
RR-259A	1.03
RR-267A	0.37
AARGP-21	4.839
AARGP-32	0.093
AARGP-35	0.05
AARGP-39	1.9
AARGP-57	0.5
AARGP-62	0.052
AARGP-89	0.5
SB-1	0.5
SB-2	0.5
SB-3	0.5
SB-4	0.5
SB-5	0.5
SB-6	0.5
SB-7	0.5

PCBs

n	Mean	t	s	√n
19	0.71	1.73	1.08	4.36

95% UCL= mean+t(s/√n)
95% UCL= 1.14

95% LCL= mean-t(s/√n)
95% LCL= 0.28

n = number of samples
t = percentage point distribution
s = standard deviation
95% UCL = 95% Upper Confidence Limit
95% LCL = 95% Lower Confidence Limit

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB FIELD SCREENING SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	FS Result
RR-001A	3
RR-002A	3
RR-003A	0.5
RR-004A	0.5
RR-005A	0.5
RR-006A	0.5
RR-007A	0.5
RR-008A	3
RR-013A	0.5
RR-231A	3
RR-232A	3
RR-233A	30
RR-234A	50
RR-235A	3
RR-236A	3
RR-237A	7.5
RR-238A	0.5
RR-239A	0.5
RR-240A	3
RR-241-1A	0.5
RR-241-2A	0.5
RR-242A	0.5
RR-243A	0.5
RR-244A	0.5
RR-245A	3
RR-246A	3
RR-247A	3
RR-248A	0.5
RR-249A	0.5
RR-250A	0.5
RR-251A	3
RR-252A	0.5
RR-253A	3
RR-254A	0.5
RR-255A	0.5
RR-256A	0.5
RR-257A	0.5
RR-258A	0.5
RR-259A	3
RR-260A	0.5
RR-261A	0.5
RR-262A	0.5
RR-263A	0.5
RR-264A	0.5
RR-265A	0.5
RR-266A	0.5
RR-267A	3
RR-268A	0.5
RR-269A	0.5

Field Screening PCBs

n	Mean	t	s	√n
137	5.28	1.69	10.32	11.70

95% UCL= mean+t(s/√n)
95% UCL= 6.8

95% LCL= mean-t(s/√n)
95% LCL= 3.8

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SOIL MANAGEMENT PLAN
SUMMARY OF PCB FIELD SCREENING SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	FS Result
RR-270A	0.5
RR-271A	0.5
RR-272A	0.5
AARGP-1	30
AARGP-2	3
AARGP-3	30
AARGP-4	7.5
AARGP-5	3
AARGP-6	30
AARGP-7	3
AARGP-8	0.5
AARGP-10	0.5
AARGP-11	3
AARGP-12	30
AARGP-13	3
AARGP-14	3
AARGP-15	30
AARGP-16	3
AARGP-17	3
AARGP-18	30
AARGP-19	0.5
AARGP-20	3
AARGP-21	3
AARGP-22	0.5
AARGP-23	3
AARGP-24	7.5
AARGP-25	0.5
AARGP-26	3
AARGP-27	50
AARGP-28	3
AARGP-29	3
AARGP-31	0.5
AARGP-32	3
AARGP-34	50
AARGP-35	3
AARGP-37	7.5
AARGP-38	3
AARGP-39	30
AARGP-40	3
AARGP-41	7.5
AARGP-42	3
AARGP-43	3
AARGP-44	7.5
AARGP-45	50
AARGP-46	3
AARGP-47	3
AARGP-48	3
AARGP-49	3
AARGP-50	0.5

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SOIL MANAGEMENT PLAN
SUMMARY OF PCB FIELD SCREENING SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	FS Result
AARGP-51	3
AARGP-52	3
AARGP-53	0.5
AARGP-54	3
AARGP-55	0.5
AARGP-56	0.5
AARGP-57	3
AARGP-58	3
AARGP-59	0.5
AARGP-60	7.5
AARGP-61	0.5
AARGP-62	3
AARGP-63	3
AARGP-64	0.5
AARGP-65	3
AARGP-66	3
AARGP-67	0.5
AARGP-68	0.5
AARGP-69	3
AARGP-70	3
AARGP-71	3
AARGP-72	3
AARGP-73	3
AARGP-74	7.5
AARGP-75	3
AARGP-76	0.5
AARGP-77	7.5
AARGP-78	3
AARGP-79	3
AARGP-80	3
AARGP-81	3
AARGP-82	3
AARGP-83	3
AARGP-84	0.5
AARGP-85	3
AARGP-86	0.5
AARGP-87	0.5
AARGP-88	3
AARGP-89	3

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SOIL MANAGEMENT PLAN
SUMMARY OF MERCURY LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	Hg Results (mg/kg)
SB-1(0'-2')	0.59
SB-1(4'-6')	0.001
SB-2	0.001
SB-4	0.001
SB-5	0.001
SB-6	0.001
SB-7	0.001
	0.001

Mercury

n	Mean	t	s	√n
8	0.09	1.94	0.22	2.83

95% UCL= mean+t(s/√n)
95% UCL= 0.2

95% LCL= mean-t(s/√n)
95% LCL= -0.1

NYSDEC TAGM = 0.10 mg/kg
USGS Background: Range ND-4.6 mg/kg
Average 0.089 mg/kg
EPA Background: Range 0.01-0.3 mg/kg
Average 0.03 mg/kg

NOTE: The mean still exceeds the TAGM recommended cleanup criteria of 0.1 mg/kg. However, this is based on a residential property use standard. A more relavant criteria would be the Michigan Generic Cleanup Criteria for Industrial and Commercial property uses. The most stringent criteria would be for GW protection (gw/sw interface protection criteria) at 0.17 mg/kg. As far as protection of human health, , the most stringent criteria would be for direct contact at 1400 mg/kg.

Furthermore, ECIDA's lab used the incorrect detection limit during analysis. The DL should have been 0.002 mg/kg, not 0.1 mg/kg.

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SOIL MANAGEMENT PLAN
SUMMARY OF CHROMIUM LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	Total Chromium Results (mg/kg)
SB-1(0'-2')	29
SB-1(4'-6')	18
SB-2	23
SB-4	47
SB-5	55
SB-6	10
SB-7	17

Total Chromium

n	Mean	t	s	√n
7	28.4286	1.9400	16.6319	2.6458

95% UCL= mean+t(s/√n)
95% UCL= 40.6239

95% LCL= mean-t(s/√n)
95% LCL= 16.23

NYSDEC TAGM = 10 mg/kg or SB
USGS Background: Range 1-2,000 mg/kg
Average 54 mg/kg
EPA Background: Range 1-1,000 mg/kg
Average 100 mg/kg

n = number of samples
t = percentage point distribution
s = standard deviation
95% UCL = 95% Upper Confidence Limit
95% LCL = 95% Lower Confidence Limit

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SOIL MANAGEMENT PLAN
SUMMARY OF SVOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA A

Location	Total SVOCs Results (ug/kg)
SB-1(0'-2')	50
SB-1(4'-6')	50
SB-2	50
SB-4	940
SB-5	1480
SB-6	8800
SB-7	50

Total SVOCs

n	Mean	t	s	√n
7	1631.43	1.94	3211.78	2.65

95% UCL= mean+t(s/√n)
95% UCL= 3986.47

95% LCL= mean-t(s/√n)
95% LCL= -723.61

Regulatory Limit = 500,000 ug/kg

n = number of samples
t = percentage point distribution
s = standard deviation
95% UCL = 95% Upper Confidence Limit
95% LCL = 95% Lower Confidence Limit

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB FIELD SCREENING SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA B

Location	FS Result (mg/kg)
B-1	0.5
B-2	0.5
B-3	0.5
B-4	0.5
B-5	0.5
B-6	0.5
B-7	0.5
B-8	0.5
B-9	0.5
B-10	3
B-11	3
B-12	3
B-13	3
B-14	3
B-15	3
B-16	0.5
B-17	0.5
B-18	0.5
B-19	0.5
B-20	0.5
B-21	0.5
B-22	0.5
B-24	3
B-25	3
B-26	3

Field Screening PCBs

n	Mean	t	s	√n
24	1.33	1.71	1.20	4.90

95% UCL= mean+t(s/√n)
95% UCL= 1.8

95% LCL= mean-t(s/√n)
95% LCL= 0.9

n = number of samples
t = percentage point distribution
s = standard deviation
95% UCL = 95% Upper Confidence Limit
95% LCL = 95% Lower Confidence Limit

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA B

Location	Lab Result (mg/kg)
B-1	0.0165
B-2	0.0165
B-3	0.0165
B-5	0.04
B-6	0.0165
B-7	0.0165
B-8	0.0165
B-9	0.08
B-10	0.0165
B-11	0.0165
B-12	0.05
B-13	1.46
B-14	0.06
B-15	0.1
B-16	0.0165
B-17	0.0165
B-18	0.0165
B-19	0.0165
B-24	0.0165
B-25	0.0165
B-26	0.0165
SS-1	0.097
SS-2	0.244
SS-3	0.0125
SS-4	0.088
SS-5	0.029
SS-6	0.44
SS-7	0.029
SB-1	0.101
SB-3	0.058
SB-4	0.0105
SB-8	0.01

PCBs

n	Mean	t	s	√n
31	0.10	1.70	0.27	5.57

95% UCL= mean+t(s/√n)
95% UCL= 0.2

95% LCL= mean-t(s/√n)
95% LCL= 0.0

n = number of samples
t = percentage point distribution
s = standard deviation
95% UCL = 95% Upper Confidence Limit
95% LCL = 95% Lower Confidence Limit

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SOIL MANAGEMENT PLAN
SUMMARY OF SVOC SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA B

Analyte	NYSDEC TAGM #4046 Cleanup Objectives (ug/kg)	MDEQ Industrial DCC (ug/kg)	SB-1 2-4' 36948	SB-2 6-8' 36948	SB-3 2-4' 36948	SB-4 4-6' 36948	SB-5 4-6' 36948	SB-6 4-6' 36948	SB-7 6-8' 36948	SB-8 2-4' 36948	SB-8 10-12' 36948	SB-9 4-6' 36949	SB-10 4-6' 36949	SB-11 5-7' 36949	SB-12 4-6' 36949	DUP-1 36949	SS-1 36950
Anthracene	50000	1.00E+09	200	22	67	165	47	150	210	195	165	165	63	355	165	220	16
Benzo(a)anthracene	330 (MDL)	1.00E+05	190	220	600	165	160	590	210	195	165	16.5	200	520	41	260	320
Benzo(b)fluoranthene	1100	1.00E+05	240	330	710	165	220	670	210	195	165	16.5	320	355	76	170	410
Benzo(k)fluoranthene	1100	1.00E+06	94	100	280	165	24	300	210	195	165	165	37	355	30	170	160
Benzo(g,h,I)perylene	50000	9.10E+06	200	225	310	165	87	180	210	195	165	165	100	355	45	170	160
Benzo(a)pyrene	330 (MDL)	1.00E+04	160	230	530	165	140	490	210	195	165	165	200	260	66	170	270
Benzoic acid	2700	1.00E+09	800	800	800	800	800	800	850	800	800	800	800	800	800	800	800
Chrysene	600	1.00E+06	250	250	630	165	160	610	210	195	165	48	220	380	35	260	400
Dibenzofuran	6200	NA	200	225	215	165	165	245	210	195	165	52	165	355	165	170	110
Fluoranthene	50000	1.80E+08	370	400	1000	165	330	1400	315	195	165	45	470	1000	11	180	580
Fluorene	50000	1.30E+08	200	225	215	165	165	245	315	195	165	165	165	355	165	255	200
Indeno(1,2,3-cd)pyrene	3200	1.00E+05	200	225	330	165	91	200	420	195	165	165	120	355	42	340	150
Phenanthrene	50000	8.00E+06	230	230	730	165	270	1100	210	195	165	170	300	990	165	220	530
Pyrene	50000	1.10E+08	320	370	940	165	270	1200	315	195	165	43	480	2400	23	510	570

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SOIL MANAGEMENT PLAN
SUMMARY OF SVOC SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA B

Analyte	NYSDEC TAGM #4046 Cleanup Objectives (ug/kg)	MDEQ Industrial DCC (ug/kg)	SS-2 36950	SS-3 36950	SS-4 36950	SS-5 36950	SS-6 36950	SS-7 36950	DUP-3 36950	n	Mean	t	s	√n	95% UCL= mean+t(s/√n)	95% LCL= mean-t(s/√n)
Anthracene	50000	1.00E+09	275	560	1800	250	395	180	175	22	265.45	1.72	365.14	4.69	399.4	131.6
Benzo(a)anthracene	330 (MDL)	1.00E+05	1100	2300	3000	530	810	130	190	22	541.48	1.72	739.27	4.69	812.6 *	270.4
Benzo(b)fluoranthene	1100	1.00E+05	1800	3200	4000	610	1200	170	210	22	701.93	1.72	1029.60	4.69	1079.5	324.4
Benzo(k)fluoranthene	1100	1.00E+06	160	370	490	240	480	60	85	22	197.05	1.72	134.81	4.69	246.5	147.6
Benzo(g,h,I)perylene	50000	9.10E+06	340	470	480	250	440	180	175	22	230.32	1.72	119.93	4.69	274.3	186.3
Benzo(a)pyrene	330 (MDL)	1.00E+04	1000	1800	2200	450	820	100	140	22	451.18	1.72	556.47	4.69	655.2 *	247.1 *
Benzoic acid	2700	1.00E+09	6700	800	800	800	800	800	800	22	1070.45	1.72	1257.42	4.69	1531.6	609.4
Chrysene	600	1.00E+06	1200	2100	2700	560	1000	150	200	22	540.36	1.72	675.15	4.69	787.9 *	292.8
Dibenzofuran	6200	NA	275	245	480	250	395	180	175	22	218.27	1.72	93.68	4.69	252.6	183.9
Fluoranthene	50000	1.80E+08	2200	4600	7100	1100	1600	240	360	22	1083.00	1.72	1686.26	4.69	1701.4	464.6
Fluorene	50000	1.30E+08	275	245	770	250	395	180	175	22	249.32	1.72	132.94	4.69	298.1	200.6
Indeno(1,2,3-cd)pyrene	3200	1.00E+05	400	580	650	150	460	180	175	22	261.73	1.72	159.34	4.69	320.2	203.3
Phenanthrene	50000	8.00E+06	1400	2700	6900	660	1100	180	230	22	856.36	1.72	1479.55	4.69	1398.9	313.8
Pyrene	50000	1.10E+08	2000	4100	5700	940	1400	210	310	22	1028.45	1.72	1421.25	4.69	1549.6	507.3

NOTES:

1. The only LCL that exceeds the TAGM standards is that for benzo(a)pyrene. The standard is very low when compared to other SVOCs. The MDEQ DCC for industrial sites is significantly higher and more representative.
2. UCL exceed TAGM for benzo(a)anthracene, benzo(a) pyrene, and chrysene. Similarly, no UCLs exceed the MDEQ DCC.
3. The only statistical mean to exceed the TAGM standard was benzo(a) pyrene.
4. The EMCON SVOC data from 10/99 was not used in the evaluation since the detection limits provided by the lab exceeded the TAGM guidance values even for non-detects. Based on the elevated detection limits the data was considered unreliable to be included for statistical evaluation.
5. The data presented was provided by ARCADIS and specific to Source Area B only.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF TOTAL METALS DATA STATISTICAL ANALYSIS
SOURCE AREA B

Analyte	NYSDEC TAGM #4046 Cleanup Objectives (mg/kg)	Michigan Industrial (mg/kg)	ARCADIS DATA															
			SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	DUP-3	SB-1 2-4'	SB-2 6-8'	SB-3 2-4'	SB-4 4-6'	SB-5 4-6'	SB-6 4-6'	SB-7 6-8'	SB-8 2-4'
			2/28/01	2/28/01	2/28/01	2/28/01	2/28/01	2/28/01	2/28/01	2/28/01	2/26/01	2/26/01	2/26/01	2/26/01	2/26/01	2/26/01	2/26/01	2/26/01
Arsenic	7.5 or SB	61	15.10	19.10	79.50	9.10	41.40	22.20	3.40	3.00	5.50	2.50	18.10	3.20	6.60	4.20	7.90	47.80
Barium	300 or SB	250000	120.00	240.00	258.00	207.00	355.00	145.00	55.40	83.30	237.00	414.00	149.00	150.00	101.00	296.00	150.00	263.00
Beryllium *	0.16 or SB	3100	1.50	1.30	1.40	1.30	2.20	0.60	0.55	0.74	2.00	2.60	0.68	0.85	0.80	2.60	0.71	1.10
Cadmium	1 or SB	4100	0.79	2.30	1.00	0.84	1.20	1.50	0.27	0.26	0.15	0.86	1.20	0.16	0.68	0.19	0.17	0.15
Chromium	10 or SB	1000000	12.50	120.00	75.90	37.60	21.10	52.20	9.40	10.40	31.80	12.90	43.50	24.50	26.00	7.50	26.90	5.90
Copper *	25 or SB	17000	30.00	447.00	517.00	61.10	124.00	162.00	16.60	23.20	23.40	6.30	175.00	18.80	13.30	16.20	121.00	30.90
Iron *	2000 or SB	1000000	10300	38900	69300	22600	64700	33200	5870	5610	29800	6340	33900	23600	54100	10800	30700	13600
Lead	200 - 500	900	50.20	771.00	664.00	64.70	123.00	176.00	18.40	25.50	25.90	9.30	128.00	10.10	22.20	22.40	157.00	13.60
Mercury	0.1	1100	0.06	0.64	0.16	0.06	0.08	0.12	0.05	0.05	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.05
Nickel *	13 or SB	270000	14.70	59.50	72.60	24.90	81.20	36.30	6.60	7.80	7.00	5.20	23.20	26.90	11.70	6.20	53.40	11.80
Selenium	2 or SB	18000	1.75	2.55	4.50	1.85	2.25	3.55	1.60	1.60	0.90	1.03	1.00	1.00	1.03	1.15	1.00	0.88
Zinc *	20 or SB	1000000	99.30	501.00	470.00	144.00	333.00	316.00	53.80	51.20	80.10	523.00	222.00	61.70	61.40	38.40	146.00	35.80

NOTES: * Non-RCRA metals. The elevated readings are likely representative (background) for the industrial area.

Note: Silver was not detected above the respective TAGM value for any samples.

With the exception of chromium, no RCRA metals had LCLs exceeding the TAGM guidance values.

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Analyte	NYSDEC TAGM #4046 Cleanup Objectives (mg/kg)	Michigan Industrial (mg/kg)	n	Mean	t	s	√n	95% UCL= mean+t(s/√n)	95% LCL= mean-t(s/√n)
Arsenic	7.5 or SB	61	36	11.24	1.69	15.61	6.00	15.6	6.8
Barium	300 or SB	250000	36	202.26	1.69	111.92	6.00	233.8	170.7
Beryllium	0.16 or SB	3100	22	1.17	1.72	0.70	4.69	1.4	0.9
Cadmium	1 or SB	4100	36	0.51	1.69	0.63	6.00	0.7	0.3
Chromium	10 or SB	1000000	36	28.98	1.69	23.45	6.00	35.6	22.4
Copper	25 or SB	17000	22	88.40	1.72	137.50	4.69	138.8	38.0
Iron	2000 or SB	1000000	22	25398.18	1.72	18413.23	4.69	32150.4	18646.0
Lead	200 - 500	900	36	75.25	1.69	164.54	6.00	121.6	28.9
Mercury	0.1	1100	36	0.11	1.69	0.11	6.00	0.1	0.1
Nickel	13 or SB	270000	22	24.77	1.72	22.68	4.69	33.1	16.5
Selenium	2 or SB	18000	36	1.14	1.69	0.89	6.00	1.4	0.9
Zinc	20 or SB	1000000	22	154.95	1.72	164.79	4.69	215.4	94.5

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GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF TOTAL METALS DATA STATISTICAL ANALYSIS
SOURCE AREA B

Analyte	NYSDEC TAGM #4046 Cleanup Objectives (mg/kg)	Michigan Industrial (mg/kg)	ARCADIS DATA (Cont'd)					
			SB-8 10-12' 2/26/01	SB-9 4-6' 2/27/01	DUP-1 2/27/01	SB-10 4-6' 2/27/01	SB-11 5-7' 2/27/01	SB-12 4-6' 2/27/01
Arsenic	7.5 or SB	61	5.80	8.30	22.30	4.60	10.50	3.70
Barium	300 or SB	250000	106.00	214.00	63.70	171.00	42.90	391.00
Beryllium *	0.16 or SB	3100	0.75	1.20	0.13	0.90	0.13	1.80
Cadmium	1 or SB	4100	0.15	0.22	0.13	0.19	0.13	0.16
Chromium	10 or SB	1000000	21.50	6.20	3.00	40.00	2.90	8.20
Copper *	25 or SB	17000	22.40	17.00	5.60	68.30	4.50	41.10
Iron *	2000 or SB	1000000	28300	23700	12400	23200	7240	10600
Lead	200 - 500	900	11.00	2.18	11.80	89.40	7.60	36.10
Mercury	0.1	1100	0.03	0.04	0.03	0.04	0.03	0.04
Nickel *	13 or SB	270000	29.20	11.80	11.20	30.40	6.60	6.70
Selenium	2 or SB	18000	0.90	1.30	1.28	1.15	0.90	0.93
Zinc *	20 or SB	1000000	64.30	18.80	18.90	105.00	11.60	53.60

Analyte	EMCON/CRA DATA													
	B 5 4-8	B 6 4-7	B 7 4-8	B 8 4-7	B 12 4-7	B 13 4-7	B 14 4-7	Dupe #3 (B14 4-7)	B 15 4-7	B 16 4-7	B 17 4-7	B 18 0-4	B 19 4-7	B 26 0-4
Arsenic	3.7	0.5	6.85	2	4.92	5.72	4.09	3.67	4.35	1.22	4.93	8.26	3.97	6.6
Barium	222	141	90.1	140	173	210	208	148	571	197	258	173	378	160
Beryllium *														
Cadmium	0.36	0.1	0.39	0.1	2.8	0.1	0.32	0.1	0.1	0.1	0.43	0.29	0.022	0.39
Chromium	76.8	19.9	15.7	36.4	13.3	35	33.8	31.4	40	26.6	29.5	30.9	32	22.1
Copper *														
Iron *														
Lead	13.5	8.64	28.4	11.6	28.8	7.5	8.94	7.89	49.2	8.77	8.39	8.16	12.1	67.9
Mercury	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Nickel *														
Selenium	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Zinc *														

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SOIL MANAGEMENT PLAN
SUMMARY OF VOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (ug/kg)	MDEQ (ug/kg)	Blind dup #1	PL5-10	PL5-11	PL5-12	Pl5-14	Pl5-15	PL5-17	PL5-1A	PL5-22	PL5-26
1,2,4-Trimethylbenzene	NA	1100000	13000	12	0.55	0.55	0.55	0.55	1.2	0.5	0.5	0.65
1,3,5-Trimethylbenzene	NA	94000	1900	4.9	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
Benzene	60	400000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
Ethylbenzene	5500	140000	570	0.6	0.55	2.1	0.55	0.55	0.55	0.5	0.5	0.65
Isopropylbenzene	NA	390000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
m-Xylene	1200	150000	2600	1.6	0.55	0.55	1.4	0.55	1.3	1.5	0.5	1.5
Naphthalene	13000	80000000	20000	420	25	440	395	410	400	405	165	8.3
Naphthalene	13000	80000000	14000	50	450	25	11	8.7	9.4	6.6	7.2	165
n-Butylbenzene	NA	10000000	15000	20	0.55	0.55	0.55	0.55	0.55	1.6	0.5	0.65
n-Propylbenzene	14000	10000000	240	0.6	3.8	3.8	0.55	0.55	0.55	0.5	0.5	0.65
o-Xylene	1200	150000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
p-Isopropyltoluene	NA	NA	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
p-Xylene	1200	150000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
sec-Butylbenzene	NA	10000000	7600	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
tert-Butylbenzene	NA	10000000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
Toluene	1500	250000	240	0.6	0.55	0.55	0.55	0.55	0.55	0.5	0.5	0.65
Total Xylenes	1200	150000	2600	1.6	1.1	1.1	1.4	1.15	2.4	1.5	1.05	1.5

	TAGM (ug/kg)	MDEQ (ug/kg)	n	Mean	t	s	√n	UCL	LCL
1,2,4-Trimethylbenzene	NA	1100000	29	2567.58	1.73	9640.2	5.39	5664.5	-529.4
1,3,5-Trimethylbenzene	NA	94000	29	327.30	1.73	666.9	5.39	541.6	113.1
Benzene	60	400000	29	106.84	1.73	301.9	5.39	203.8	9.9
Ethylbenzene	5500	140000	29	152.65	1.73	367.5	5.39	270.7	34.6
Isopropylbenzene	NA	390000	29	122.53	1.73	338.3	5.39	231.2	13.8
m-Xylene	1200	150000	29	423.59	1.73	1278.5	5.39	834.3	12.9
Naphthalene	13000	80000000	29	2116.15	1.73	4740.4	5.39	3639.0	593.3
Naphthalene	13000	80000000	19	7403.68	1.73	22902.5	4.36	16493.4	-1686.1
n-Butylbenzene	NA	10000000	29	2547.88	1.73	6938.9	5.39	4777.0	318.7
n-Propylbenzene	14000	10000000	29	156.98	1.73	352.1	5.39	270.1	43.9
o-Xylene	1200	150000	29	62.91	1.73	110.6	5.39	98.5	27.4
p-Isopropyltoluene	NA	NA	29	41.56	1.73	54.5	5.39	59.1	24.0
p-Xylene	1200	150000	19	27.28	1.73	61.3	4.36	51.6	2.9
sec-Butylbenzene	NA	10000000	29	1109.89	1.73	2913.9	5.39	2046.0	173.8
tert-Butylbenzene	NA	10000000	29	56.26	1.73	95.0	5.39	86.8	25.7
Toluene	1500	250000	29	64.27	1.73	99.6	5.39	96.3	32.3
Total Xylenes	1200	150000	29	437.74	1.73	1285.3	5.39	850.7	24.8

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SOIL MANAGEMENT PLAN
SUMMARY OF VOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (ug/kg)	MDEQ (ug/kg)	PL5-28	PL5-2A	PL5-30	PL5-31	PL5-3A	PL5-5A	PL5-6	PL5-8	PL5-9	P5-14A	P5-17A
1,2,4-Trimethylbenzene	NA	1100000	2	51000	4.2	2300	11	2500	20	3100	1400	62.5	67.5
1,3,5-Trimethylbenzene	NA	94000	0.6	2800	2.4	1600	0.495	420	4.5	790	660	62.5	67.5
Benzene	60	400000	0.6	140	0.65	25	0.495	1600	0.55	48	24	62.5	67.5
Ethylbenzene	5500	140000	1.8	1900	2	74	0.495	340	1.5	48	24	62.5	67.5
Isopropylbenzene	NA	390000	0.6	1800	0.65	140	0.495	280	0.55	48	24	62.5	67.5
m-Xylene	1200	150000	0.6	6500	3.6	350	1.7	1200	3.8	310	230	62.5	67.5
Naphthalene	13000	80000000	4600	17000	14	1950	365	4000	430	390	4000	375	67.5
Naphthalene	13000	80000000	310	16000	375	3600	12	1500	240	3900	100000		
n-Butylbenzene	NA	10000000	0.6	32000	6.4	3100	33	3700	20	16000	2800	62.5	67.5
n-Propylbenzene	14000	10000000	0.6	1700	0.65	90	4	760	5.6	48	24	62.5	67.5
o-Xylene	1200	150000	0.6	140	1.8	25	0.495	370	2.4	48	24	62.5	67.5
p-Isopropyltoluene	NA	NA	0.6	140	0.65	25	0.495	34	0.55	48	24	62.5	67.5
p-Xylene	1200	150000	0.6	140	0.65	25	0.495	34	0.55	48	24		
sec-Butylbenzene	NA	10000000	0.6	13000	2.3	1200	0.495	2100	4.4	6300	960	62.5	67.5
tert-Butylbenzene	NA	10000000	0.6	140	0.65	25	2.2	34	0.55	48	24	62.5	67.5
Toluene	1500	250000	0.6	140	3.8	76	0.495	230	0.55	48	24	144	67.5
Total Xylenes	1200	150000	1.2	6500	5.4	350	1.7	1500	6.3	310	230	62.5	67.5

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF VOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (ug/kg)	MDEQ (ug/kg)	P5-97A Dupe of P5-17A	P5-20A	P5-22A	P5-9A	P5-11A	P5-1B	P5-2A	P5-4C
1,2,4-Trimethylbenzene	NA	1100000	70	60	70	64	62.5	369	135	145
1,3,5-Trimethylbenzene	NA	94000	70	60	70	64	62.5	182	211	455
Benzene	60	400000	70	60	70	64	62.5	47	55.5	455
Ethylbenzene	5500	140000	70	60	70	64	62.5	194	353	455
Isopropylbenzene	NA	390000	70	60	70	64	62.5	47	55.5	455
m-Xylene	1200	150000	70	60	70	64	62.5	108	55.5	455
Naphthalene	13000	80000000	70	540	70	3190	794	334	55.5	455
Naphthalene	13000	80000000								
n-Butylbenzene	NA	10000000	70	60	70	171	62.5	129	55.5	455
n-Propylbenzene	14000	10000000	70	60	70	64	140	246	717	171
o-Xylene	1200	150000	70	60	70	64	62.5	0.102	55.5	455
p-Isopropyltoluene	NA	NA	70	60	70	64	62.5	47	55.5	128
p-Xylene	1200	150000								
sec-Butylbenzene	NA	10000000	70	60	70	64	62.5	47	55.5	455
tert-Butylbenzene	NA	10000000	70	60	70	64	62.5	47	153	455
Toluene	1500	250000	70	60	70	64	62.5	47	55.5	455
Total Xylenes	1200	150000	70	60	70	64	62.5	210	55.5	455

NOTES:
1 All LCLs were below TAGM.
2 All means were below TAGM with the exception of Benzene.
3 UCLs for benzene and naphthalene exceeded TAGM.
4 When compared to MDEQ Industrial DCC, there were no exceedances.

95% UCL='mean+t(s/√n)
95% LCL='mean-t(s/√n)

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SOIL MANAGEMENT PLAN
SUMMARY OF SVOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (mg/kg)	MDEQ (mg/kg)	Blind dup #1	PL5-10	PL5-11	PL5-12	PL5-14	PL5-15	PL5-17	PL5-1A	PL5-22	PL5-26	PL5-28
Acenaphthene	50000	810000000	18000	420	450	440	395	410	400	405	165	165	4600
Anthracene	50000	1000000000	22000	1000	450	440	395	410	400	890	165	165	4600
Benzo(a)anthracene	224 or MDL	210000	21000	5100	450	440	395	410	1000	1700	165	165	10000
Benzo(a)pyrene	61 or MDL	21000	16000	4900	450	440	395	410	400	1000	165	165	4600
Benzo(b)fluoranthene	1100	210000	27000	8600	450	440	395	410	400	1000	165	165	4600
Benzo(ghi)perylene	50000	16000000	4200	1400	450	440	395	410	400	405	165	165	4600
Benzo(k)fluoranthene	1100	2100000	4200	420	450	440	395	410	400	405	165	165	4600
Chrysene	400	21000000	14000	5200	450	440	395	410	1100	1200	165	165	4600
Dibenzo(a,h)anthracene	14 or MDL	21000	4200	420	450	440	395	410	400	405	165	165	4600
Fluoranthene	50000	540000000	49000	7500	450	440	395	410	2800	3600	165	165	23000
Fluorene	50000	540000000	20000	420	450	440	395	410	400	405	165	165	4600
Indeno(1,2,3-cd)pyrene	3200	210000	4200	1600	450	440	395	410	400	405	165	165	4600
Phenanthrene	50000	16000000	72000	2700	450	440	395	410	2200	4300	165	165	14000
Pyrene	50000	340000000	49000	10000	450	440	395	410	2100	3500	165	165	17000

	TAGM (mg/kg)	MDEQ (mg/kg)	n	Mean	t	s	√n	95% UCL= mean+t(s/√n)	95% LCL= mean-t(s/√n)
Acenaphthene	50000	810000000	29	5036.38	1.7	12725.0	5.39	9053.4	1019.3
Anthracene	50000	1000000000	29	6814.66	1.7	19002.4	5.39	12813.4	815.9
Benzo(a)anthracene	224 or MDL	210000	29	7322.79	1.7	17468.8	5.39	12837.4	1808.2
Benzo(a)pyrene	61 or MDL	21000	29	5820.07	1.7	13854.4	5.39	10193.7	1446.5
Benzo(b)fluoranthene	1100	210000	29	8813.79	1.7	23422.1	5.39	16207.7	1419.9
Benzo(ghi)perylene	50000	16000000	29	2028.86	1.7	3818.5	5.39	3234.3	823.4
Benzo(k)fluoranthene	1100	2100000	29	2371.69	1.7	4623.6	5.39	3831.3	912.1
Chrysene	400	21000000	29	6131.72	1.7	15685.2	5.39	11083.3	1180.2
Dibenzo(a,h)anthracene	14 or MDL	21000	29	1113.28	1.7	1437.6	5.39	1567.1	659.5
Fluoranthene	50000	540000000	29	14118.79	1.7	35698.5	5.39	25388.2	2849.4
Fluorene	50000	540000000	29	5735.00	1.7	14079.5	5.39	10179.6	1290.4
Indeno(1,2,3-cd)pyrene	3200	210000	29	2182.76	1.7	4355.6	5.39	3557.7	807.8
Phenanthrene	50000	16000000	29	20927.59	1.7	53622.8	5.39	37855.3	3999.8
Pyrene	50000	340000000	29	13314.66	1.7	32270.1	5.39	23501.7	3127.6

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SVOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (mg/kg)	MDEQ (mg/kg)	PL5-2A	PL5-30	PL5-31	PL5-3A	PL5-5A	PL5-6	PL5-8	PL5-9	P5-14A	P5-17A	P5-97A Dupe of P5-17A
Acenaphthene	50000	810000000	22000	375	1950	365	2300	430	860	63000	2250	2150	2155
Anthracene	50000	1000000000	28000	375	1950	365	380	2900	2800	98000	2250	2150	2155
Benzo(a)anthracene	224 or MDL	210000	31000	375	1950	365	380	5800	5800	88000	2250	2150	2155
Benzo(a)pyrene	61 or MDL	21000	25000	375	1950	365	380	4400	5500	70000	2250	2150	2155
Benzo(b)fluoranthene	1100	210000	42000	375	1950	365	380	5600	9200	120000	2250	2150	2155
Benzo(ghi)perylene	50000	16000000	4350	375	1950	365	380	1500	1900	20000	2250	2150	2155
Benzo(k)fluoranthene	1100	2100000	4350	375	1950	365	380	2100	1000	13000	2250	2150	2155
Chrysene	400	21000000	21000	375	1950	365	380	5600	5500	82000	2250	2150	2155
Dibenzo(a,h)anthracene	14 or MDL	21000	4350	375	1950	365	380	430	390	3950	2250	2150	2155
Fluoranthene	50000	540000000	69000	375	1950	850	1700	13000	12000	180000	2250	2150	2155
Fluorene	50000	540000000	24000	375	1950	365	4200	1800	1000	69000	2250	2150	2155
Indeno(1,2,3-cd)pyrene	3200	210000	4350	375	1950	365	380	1700	2100	23000	2250	2150	2155
Phenanthrene	50000	16000000	84000	375	1950	365	9300	11000	7400	250000	2250	2150	2155
Pyrene	50000	340000000	69000	375	4200	880	1300	12000	9200	160000	6980	2150	2155

NOTES:

1 LCLs for benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene exceed TAGM.
Detection limits exceeded TAGM to start.

2 Means for above plus benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene exceed TAGM.
Detection limits exceeded TAGM guidance values in many cases.

3 UCLs for above plus indeno(1,2,3-c,d)pyrene exceed TAGM.
Detection limits exceeded TAGM guidance values in many cases.

4 When compared to MDEQ Industrial DCC, there were no exceedances.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF SVOC LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM (mg/kg)	MDEQ (mg/kg)	P5-20A	P5-22A	P5-9A	P5-11A	P5-1B	P5-2A	P5-4C
Acenaphthene	50000	810000000	230	220	21100	245	185	205	185
Anthracene	50000	1000000000	230	220	22900	245	185	1420	185
Benzo(a)anthracene	224 or MDL	210000	230	220	27000	245	731	2700	185
Benzo(a)pyrene	61 or MDL	21000	230	220	21300	245	662	2490	185
Benzo(b)fluoranthene	1100	210000	230	220	22000	245	600	2070	185
Benzo(ghi)perylene	50000	16000000	230	220	6430	245	185	937	185
Benzo(k)fluoranthene	1100	2100000	230	220	22400	245	664	2710	185
Chrysene	400	21000000	230	220	21900	245	770	2420	185
Dibenzo(a,h)anthracene	14 or MDL	21000	230	220	220	245	185	205	185
Fluoranthene	50000	540000000	230	220	30800	245	1400	3010	185
Fluorene	50000	540000000	230	220	26500	245	440	1400	185
Indeno(1,2,3-cd)pyrene	3200	210000	230	220	7200	245	185	1030	185
Phenanthrene	50000	16000000	230	220	134000	245	1370	2480	185
Pyrene	50000	340000000	720	220	28500	245	1380	3010	185

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GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM	Blind dup #2	PL5-10	PL5-11	PL5-12	Pl5-14	PL5-15	PL5-1A	PL5-2A	PL5-3A	PL5-5A	PL5-6	PL5-8
Aroclor 1016	10	0.01	0.0105	0.011	0.011	0.01	0.0105	0.0105	0.055	0.009	0.0095	0.0105	0.01
Aroclor 1221	10	0.01	0.0105	0.011	0.011	0.01	0.0105	0.0105	0.055	0.009	0.0095	0.0105	0.01
Aroclor 1232	10	0.01	0.0105	0.011	0.011	0.01	0.0105	0.0105	0.055	0.009	0.0095	0.0105	0.01
Aroclor 1242	10	0.01	0.0105	0.011	0.011	0.01	0.0105	0.0105	0.055	0.009	0.0095	0.0105	0.01
Aroclor 1248	10	0.01	0.0105	0.011	0.011	0.01	0.0105	0.056	0.055	0.009	0.0095	0.0105	0.01
Aroclor 1254	10	0.038	0.0105	0.011	0.011	0.01	0.0105	0.048	1.3	0.077	0.0095	0.023	0.1
Aroclor 1260	10	0.026	0.025	0.011	0.011	0.01	0.0105	0.0105	0.055	0.009	0.2	0.0105	0.01
Total PCBS	10	0.064	0.0105	0.011	0.011	0.02	0.021	0.104	1.3	0.077	0.2	0.023	0.1

	TAGM	n	Mean	t	s	√n	95% UCL= mean+t(s/√n)	95% LCL= mean-t(s/√n)
Aroclor 1016	10	22	0.06	1.72	0.09	4.69	0.09	0.02
Aroclor 1221	10	22	0.06	1.72	0.09	4.69	0.09	0.02
Aroclor 1232	10	22	0.06	1.72	0.09	4.69	0.09	0.02
Aroclor 1242	10	22	0.06	1.72	0.09	4.69	0.09	0.02
Aroclor 1248	10	22	0.06	1.72	0.09	4.69	0.09	0.03
Aroclor 1254	10	22	0.12	1.72	0.28	4.69	0.23	0.02
Aroclor 1260	10	22	0.07	1.72	0.09	4.69	0.10	0.03
Total PCBS	10	22	0.15	1.72	0.27	4.69	0.25	0.05

ALL LCL, MEAN, AND UCL BELOW TAGM.

GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF PCB LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM	PL5-9	P5-2A	P5-10A	P5-98A Dupe of P5-10A	P5-14A	P5-20A	B-6 A	B-11 A	B-16 A	B-19 A
Aroclor 1016	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1221	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1232	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1242	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1248	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1254	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Aroclor 1260	10	0.1	0.0085	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235
Total PCBS	10	0.2	0.078	0.01	0.01	0.01	0.01	0.235	0.24	0.235	0.235

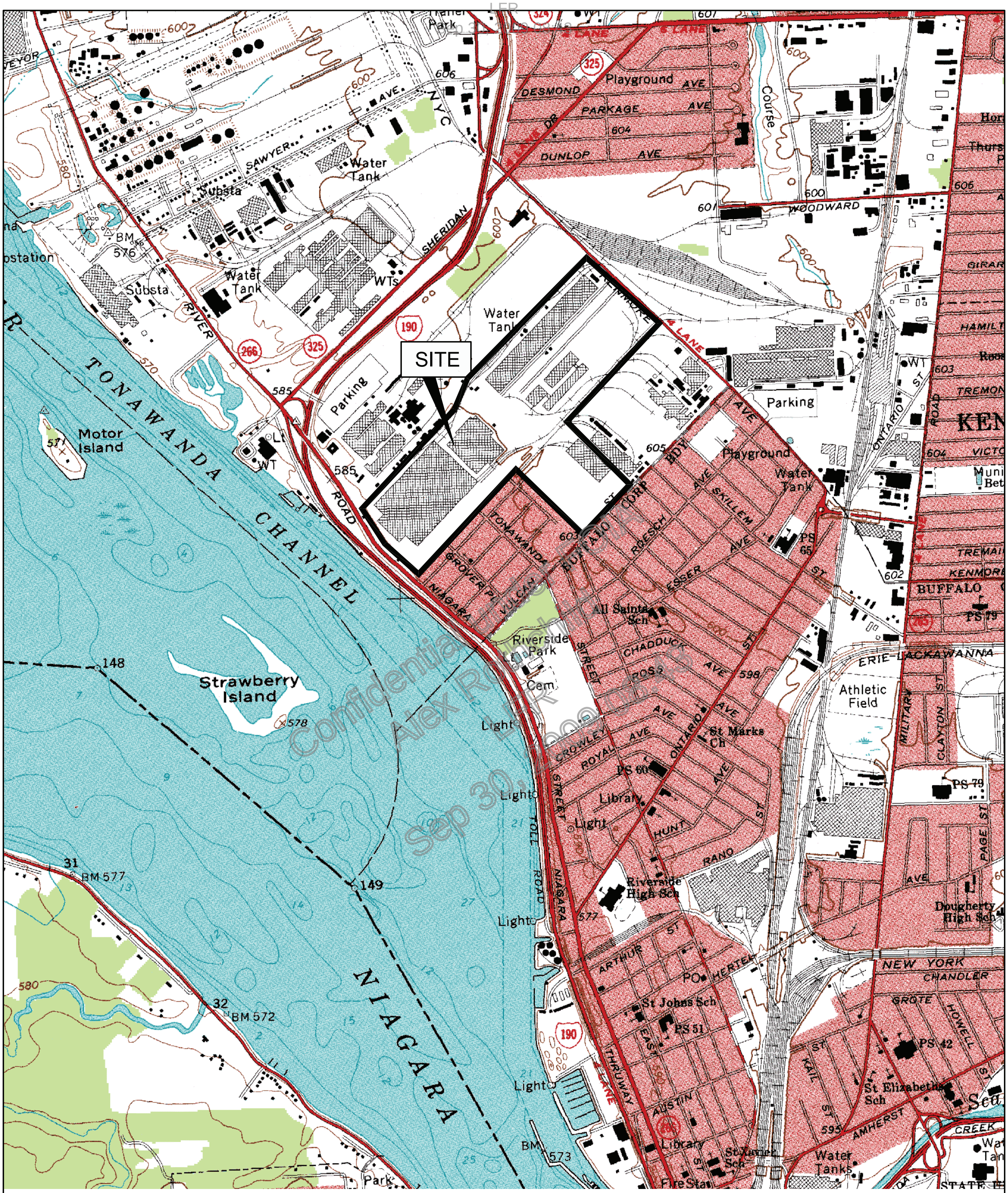
GENERAL MOTORS CORPORATION
SOIL MANAGEMENT PLAN
SUMMARY OF METALS LABORATORY SOIL DATA STATISTICAL ANALYSIS
SOURCE AREA C

	TAGM	MDEQ	Blind dup #1	PL5-10	PL5-11	PL5-12	Pl5-14	PL5-15	PL5-1A	PL5-2A	PL5-3A	PL5-5A	PL5-6	PL5-8	PL5-9	B-6 A	B-11 A	B-16 A	B-19 A
Arsenic	7.5	100	13.2	6.3	6.55	6.85	5.9	0.66	6	6.45	5.7	5.7	6.45	6.1	6.2	0.585	0.6	2.25	3.08
Barium	300	320000	102	304	165	199	138	111	90.8	89.4	50.4	60.8	160	154	366	254	213	93	256
Cadmium	1	2300	0.45	0.315	0.46	0.86	0.295	0.38	0.3	0.32	0.285	0.285	0.32	0.305	0.31	0.2915	0.2995	0.291	0.295
Chromium	10	1000000	33.2	19.6	21.6	25.2	22.2	18.5	21	37.1	14.9	16.6	25	5.4	14.3	3.61	4.71	17.1	17.7
Lead	500	900	40.3	34.6	12.7	12.1	10.8	16.3	9.9	31	10.7	19	14.2	8.5	11.2	1.165	1.795	7.83	10.5
Mercury	0.1	1400	0.06	0.055	0.07	0.65	0.6	0.6	0.55	0.06	0.05	0.055	0.06	0.55	0.06	0.0292	0.02995	0.0291	0.226
Selenium	2	23000	2	1.9	1.95	2.05	1.75	2	1.8	1.9	1.7	1.7	1.95	1.85	1.85	1.63	2.49	0.291	0.683
Silver	SB	---	0.65	0.65	0.65	0.7	0.6	0.65	0.6	0.65	0.55	0.55	0.65	0.6	0.6	0.585	0.6	0.58	0.59

	TAGM	MDEQ	n	Mean	t	s	√n	95% UCL= mean+t(s/√n)	95% LCL= mean-t(s/√n)
Arsenic	7.5	100	17	5.21	1.75	3.09	4.12	6.5	3.9
Barium	300	320000	17	165.08	1.75	89.28	4.12	203.0	127.2
Cadmium	1	2300	17	0.36	1.75	0.14	4.12	0.4	0.3
Chromium	10	1000000	17	18.69	1.75	9.01	4.12	22.5	14.9
Lead	500	900	17	14.86	1.75	10.81	4.12	19.4	10.3
Mercury	0.1	1400	17	0.22	1.75	0.25	4.12	0.3	0.1
Selenium	2	23000	17	1.73	1.75	0.51	4.12	2.0	1.5
Silver			17	0.62	1.75	0.04	4.12	0.6	0.6

Notes:
1. LCL, mean, and UCL for chromium are above TAGM of 10. Elevated readings may be considered as background for industrial area. Values well below MDEQ.
2. Mean and UCL for mercury above TAGM. Most likely due to higher detection limits. LCL at TAGM.

CRA 17177 (11)



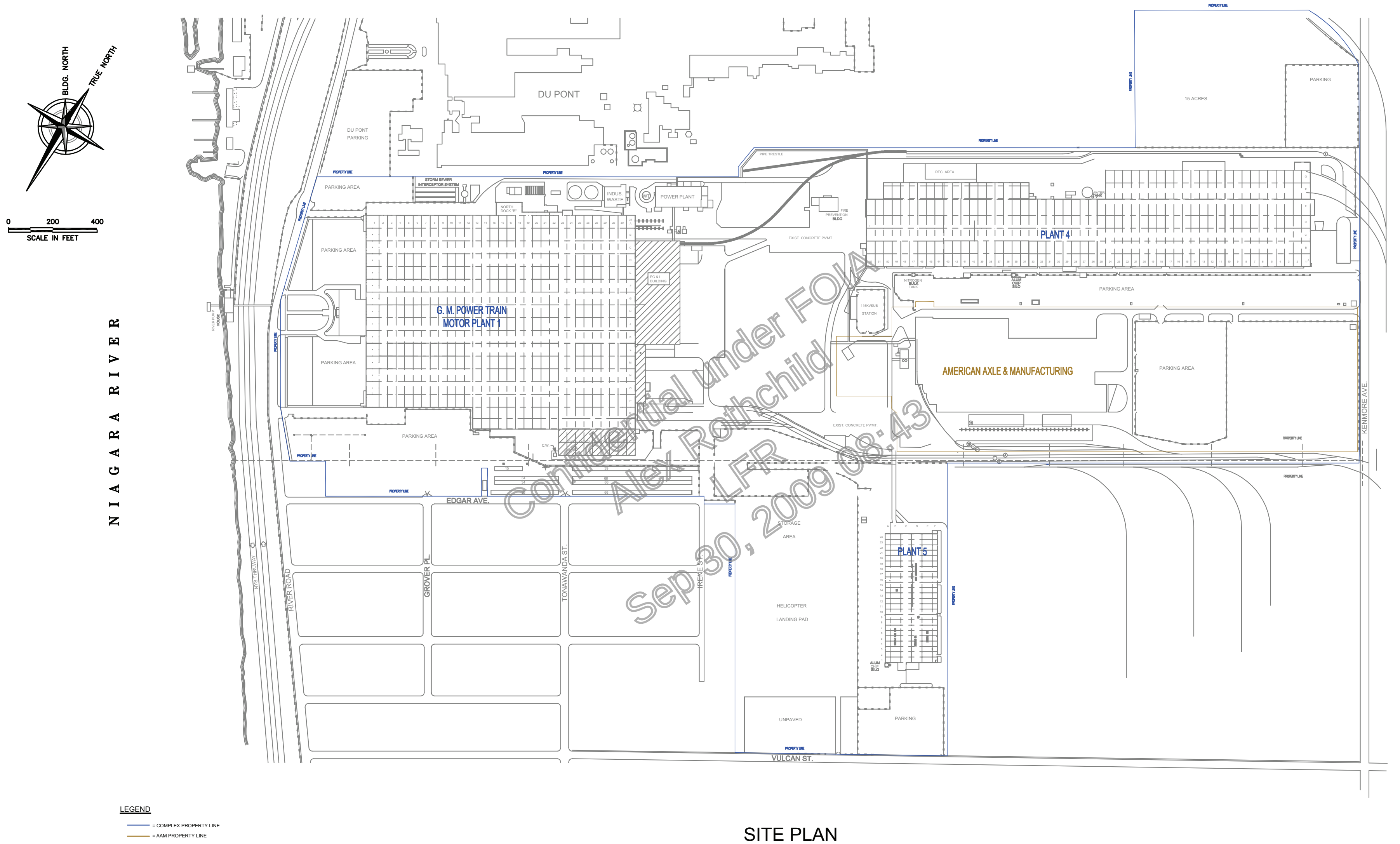
REFERENCE:

UNITED STATES GEOLOGIC SURVEY
TONAWANDA WEST QUADRANGLE, NY
TOPOGRAPHIC, 7.5 MINUTES SERIES 1965
SCALE: 1:24,000

DRAWING 1

SITE LOCATION MAP
GENERAL MOTORS CORPORATION
TONAWANDA ENGINE PLANT
Tonawanda, Erie County, New York

17177-50(001)GN-NF001 APR 24/2001



SITE PLAN

NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

No.	Revision	Date	Initial	Approved

GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

SOILS MANAGEMENT PLAN

SITE PLAN

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No.: GN-002	Rev.No.: 1
Designed by: JLL	Field book:	Project No.: 17177-11	Drawing No.: 2	
Checked by: DJH				

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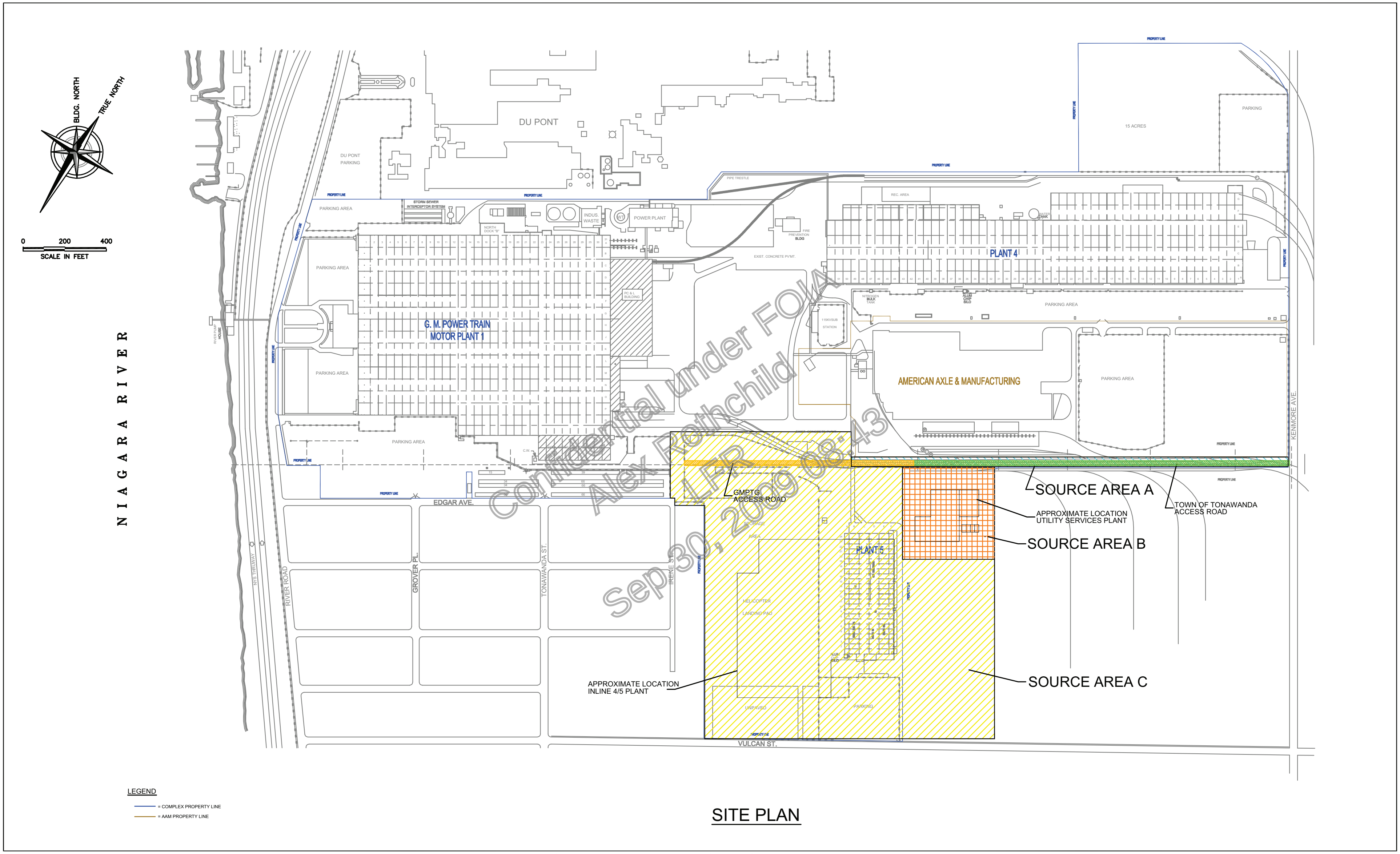

SITE PLAN

NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN", TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
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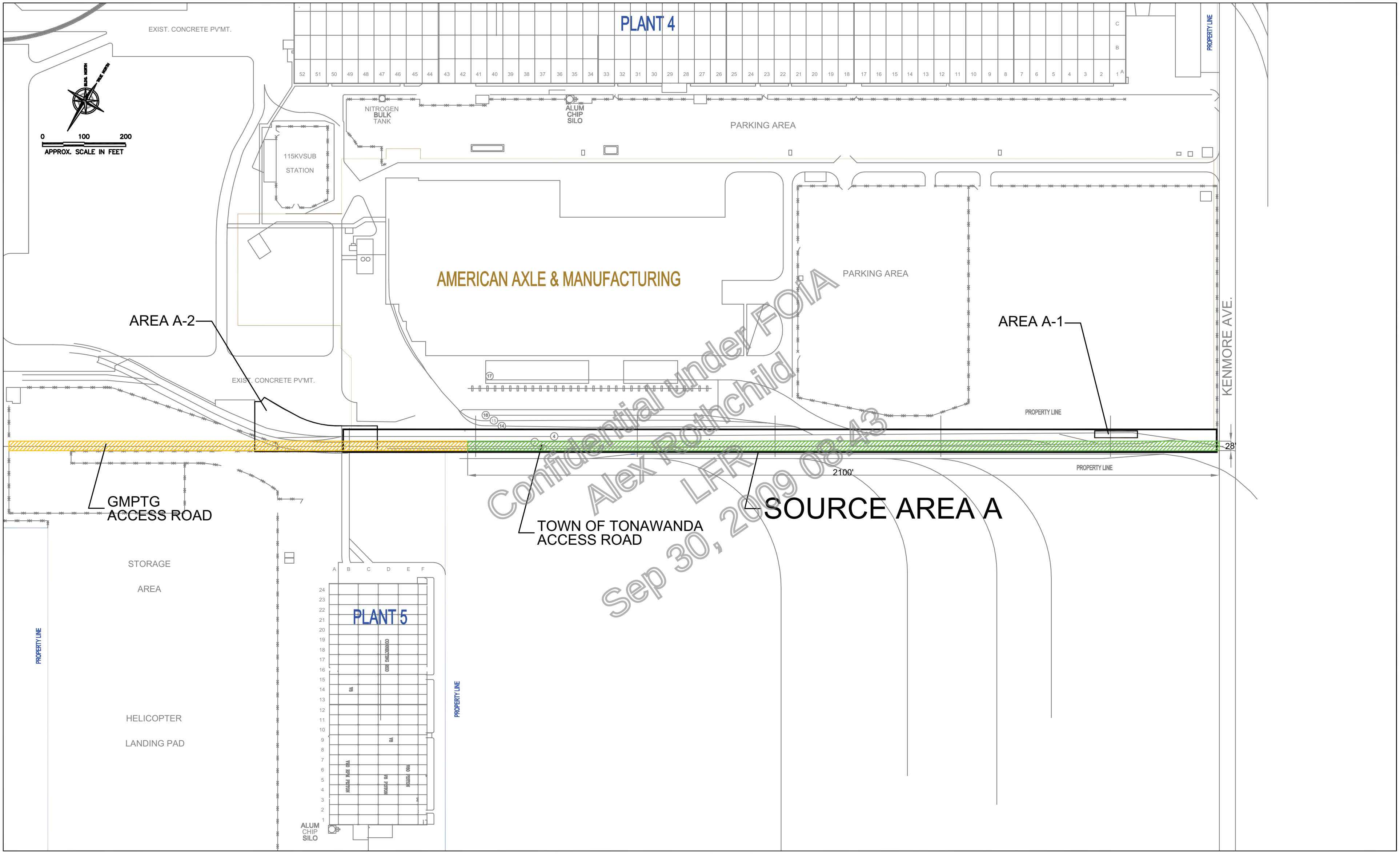
GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

SOILS MANAGEMENT PLAN

SOURCE AREAS

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No.: GN-003	Rev. No.: 1
Designed by: JLL	Field book:	Project No.: 17177-50	Drawing No.: 3	
Checked by: DJH				



NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
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GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

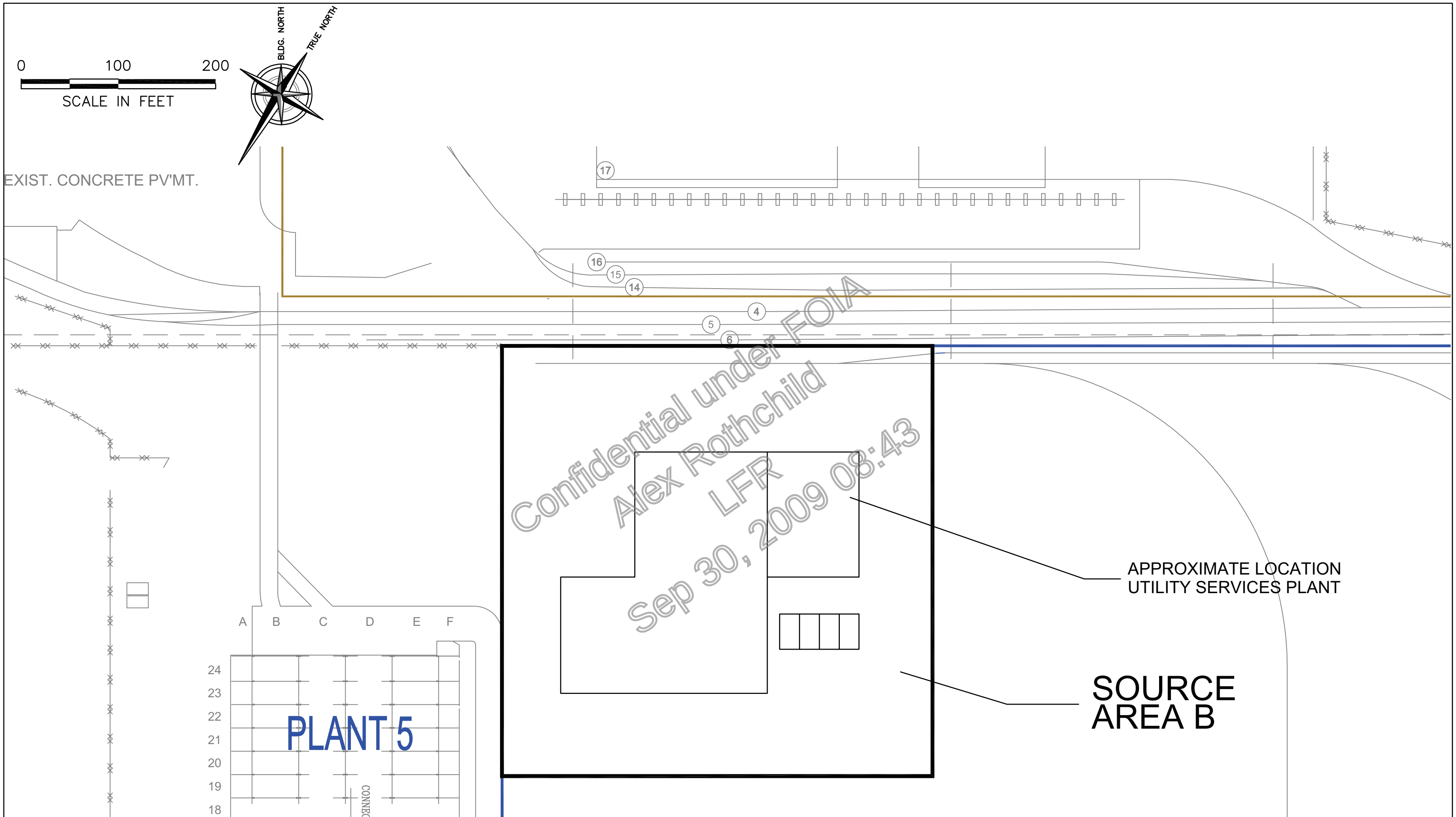
SOILS MANAGEMENT PLAN

SOURCE AREA A

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No: GN-004	Rev.No: 1
Designed by: JLL	Field book:	Project No: 17177-50	Drawing No: 4	
Checked by: DJH				

17177-50(011)GN-NF004 APR 24/2001



NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

DRAWING NO. 5

SOURCE AREA B
GM POWERTRAIN TONAWANDA ENGINE PLANT
SOILS MANAGEMENT PLAN
TONAWANDA, ERIE CO., NEW YORK

17177-50(011)GN005 ARP 24/2001

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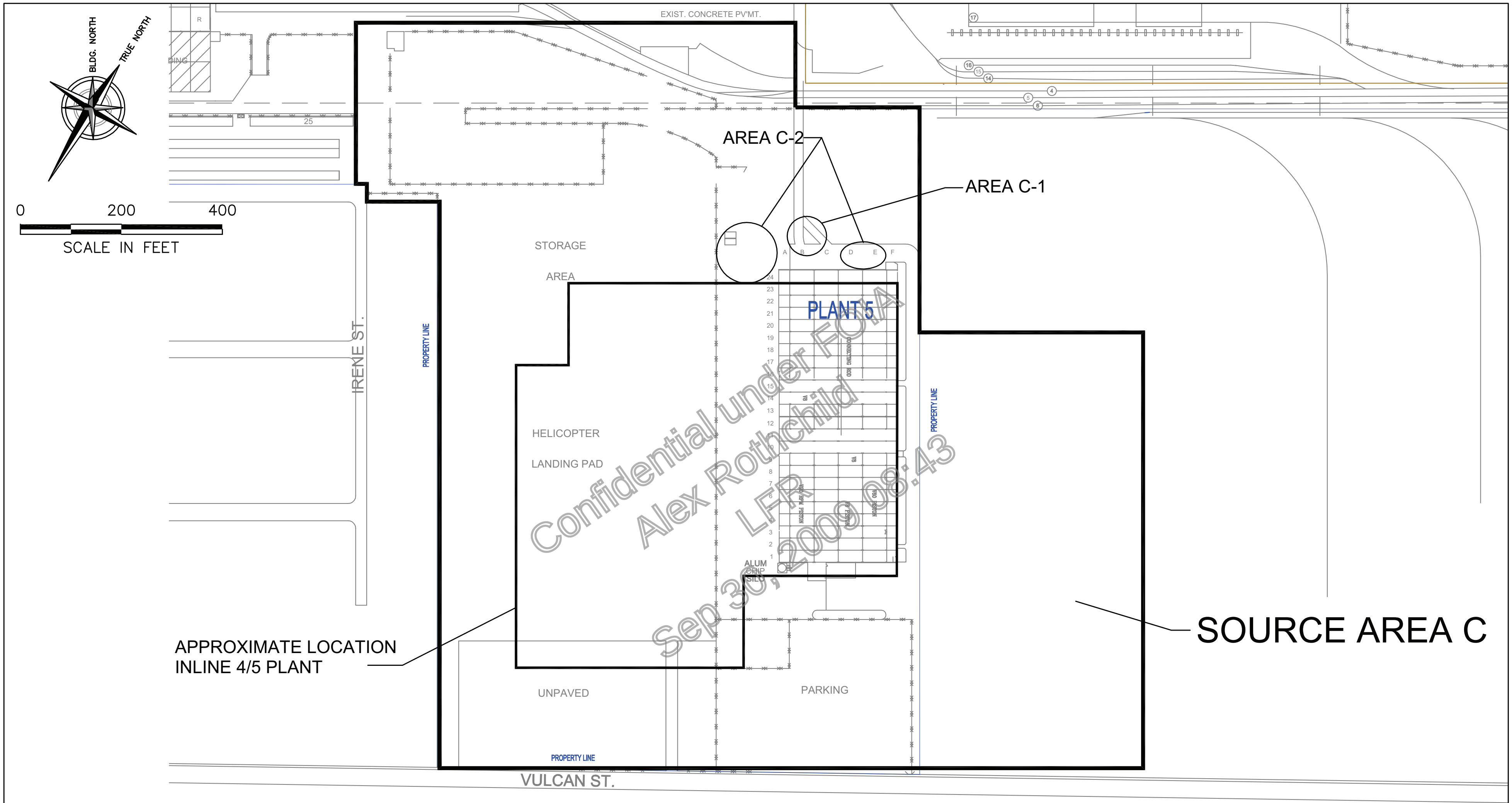


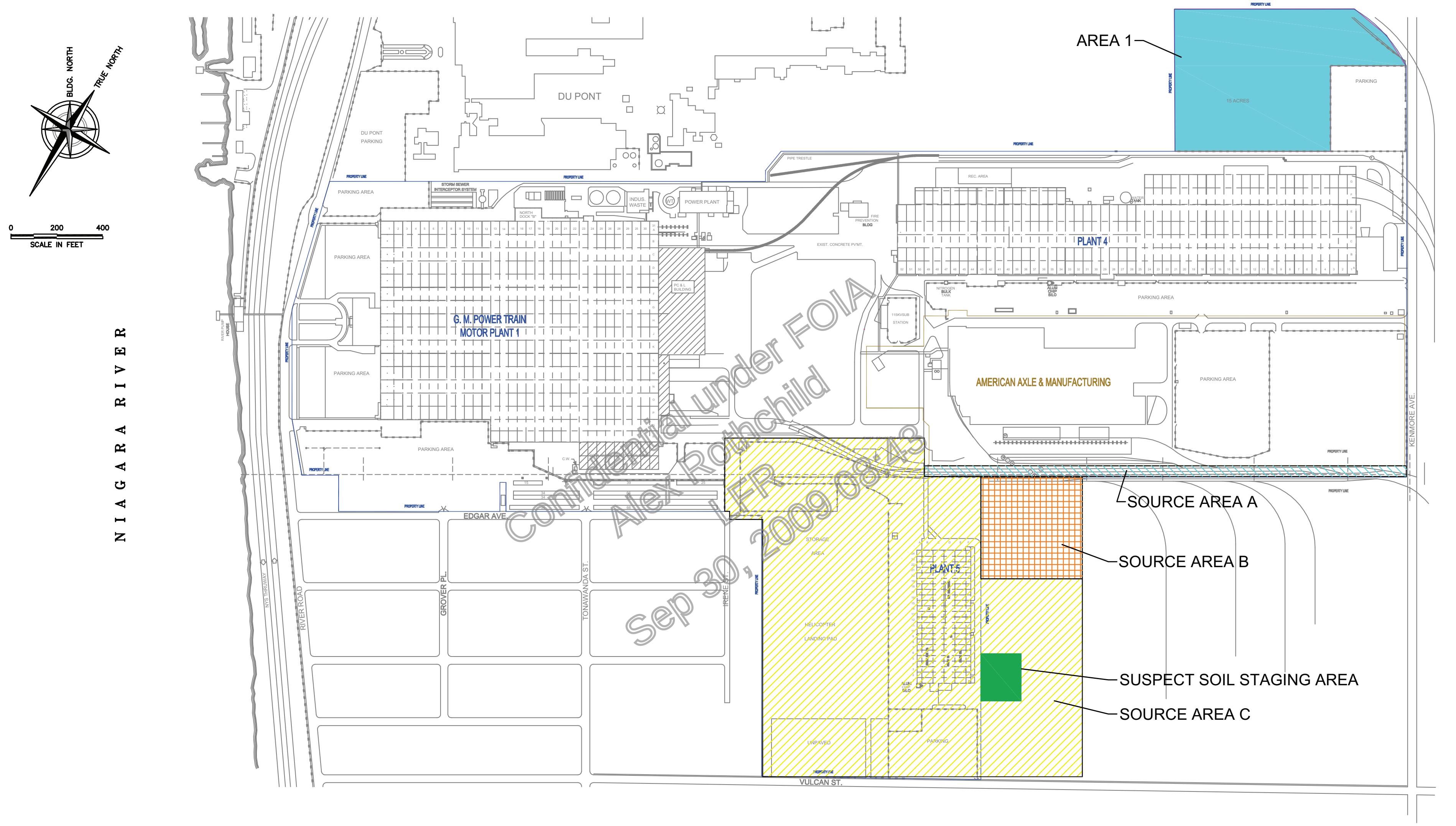
NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

DRAWING NO. 6

SOURCE AREA C
GM POWERTRAIN TONAWANDA ENGINE PLANT
SOILS MANAGEMENT PLAN
TONAWANDA, ERIE CO., NEW YORK

17056-50(011)GN-NF006 JUL 18/2001



SITE PLAN

LEGEND

- = COMPLEX PROPERTY LINE
- = AAM PROPERTY LINE
- = SOIL MANAGEMENT AREAS

NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

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GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

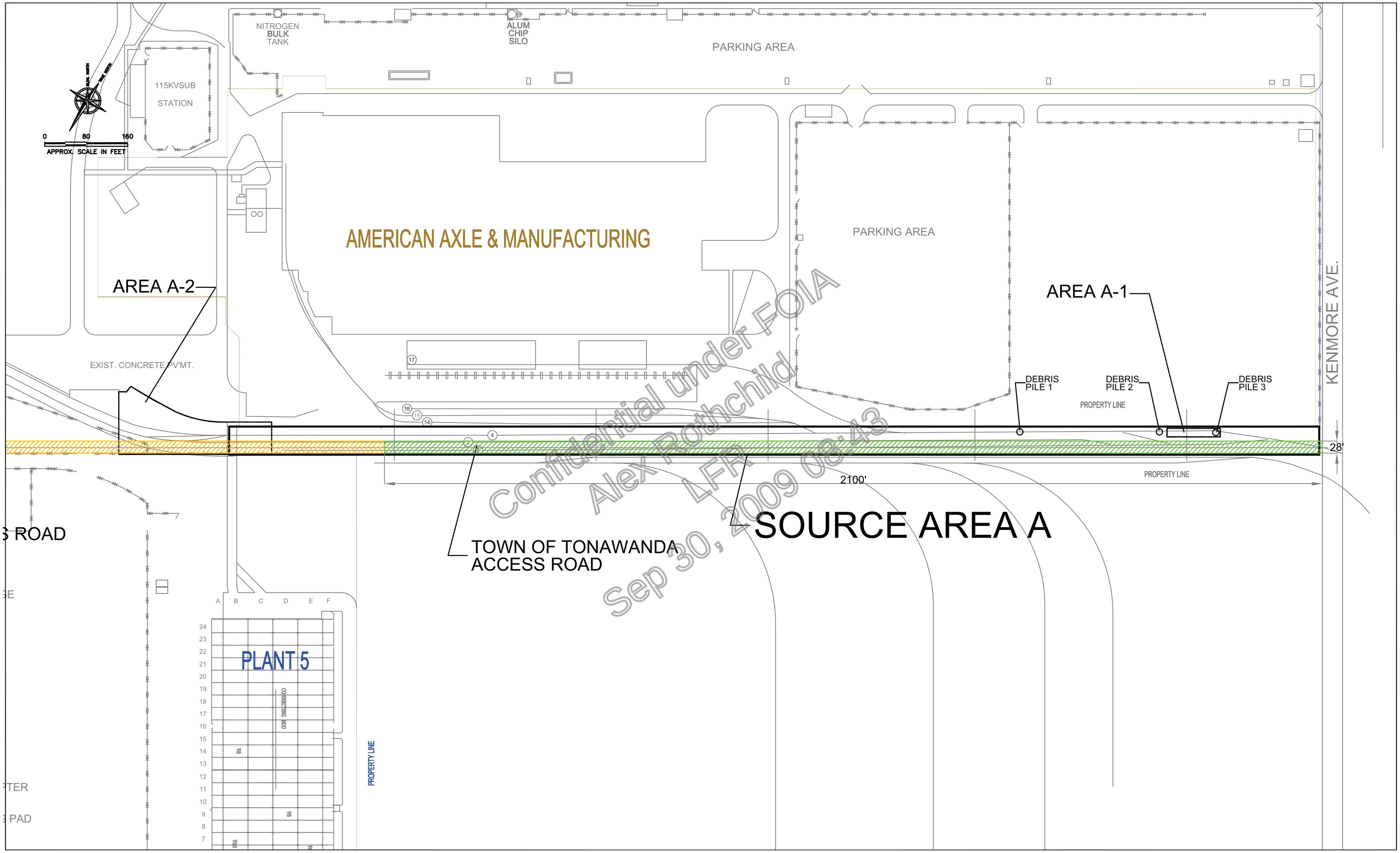
SOILS MANAGEMENT PLAN

SOIL MANAGEMENT AREAS

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No: GN-007	Rev.No: 1
Designed by: JLL	Field book:	Project No: 17177-50	Drawing No: 7	
Checked by: DJH				

17177-50(001)GN-NF007 APR 24/2001



NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

No.	Revision	Date	Initial

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GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

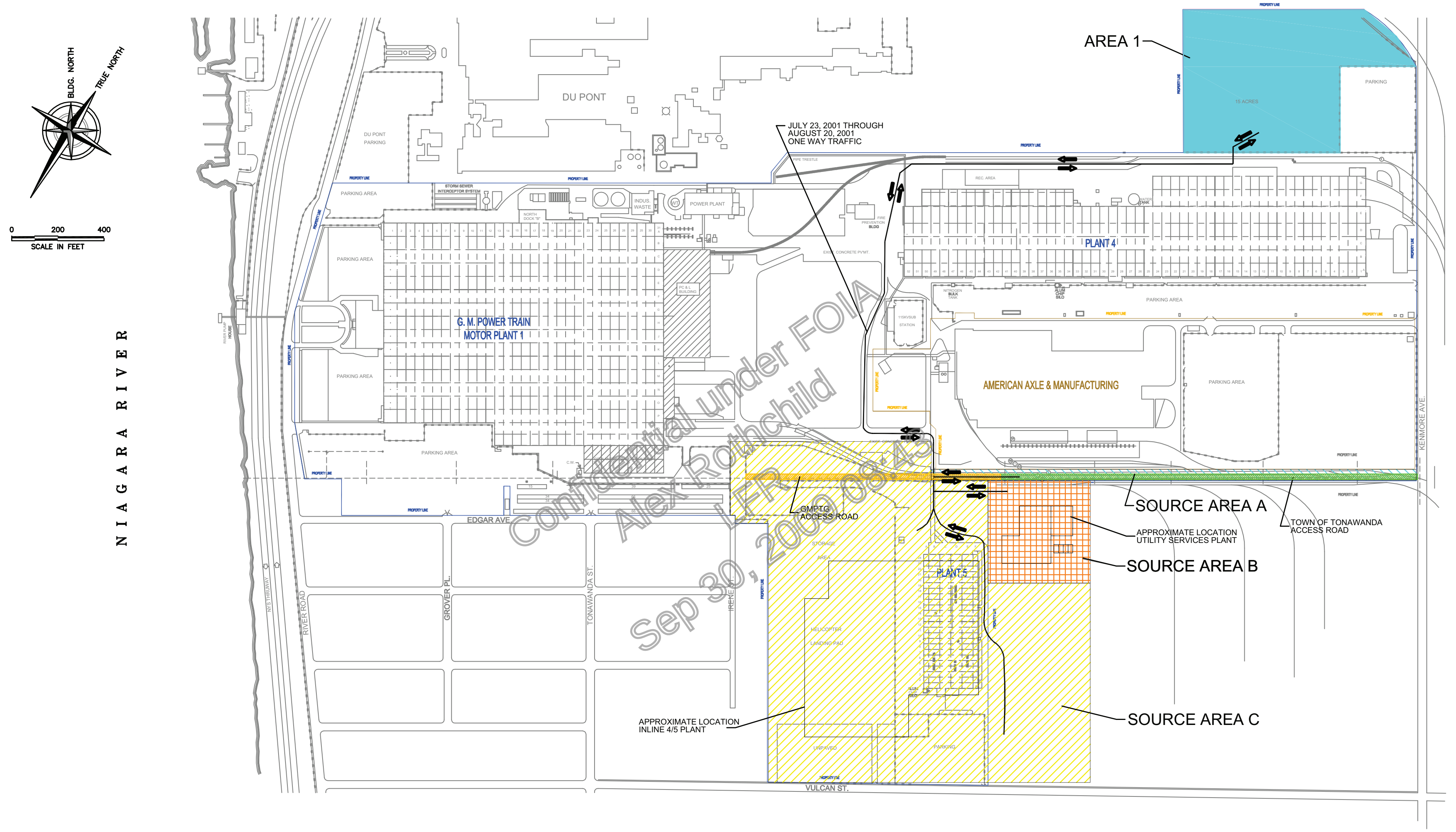
SOILS MANAGEMENT PLAN

AREA A-1 & AREA A-2

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No.: GN-008	Rev.No.: 1
Designed by: JLL				
Checked by: DJH	Field book:	Project No.: 17177-50	Drawing No.: 8	

17177-50(011)GN-NF008 APR 24/2001



LEGEND

- = COMPLEX PROPERTY LINE
- = AAM PROPERTY LINE
- = SOIL MANAGEMENT AREAS

SITE PLAN

NOTE:

1. BASEMAP REFERENCE "GMPTG TONAWANDA SITE PLAN". TONAWANDA, NY, PREPARED BY: LAUER-MANGUSO & ASSOCIATES ARCHITECTS, DWG. NO.: GM-C-01-K, DATE: 4/20/98.
2. BASE DRAWING PROVIDED BY GMPTG ENGINEERING DEPT., TONAWANDA, NY, DATE: 3/99 AND IT CORPORATION, GRAND ISLAND, NY 8/00.

No.	Revision	Date	Initial

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GENERAL MOTORS POWERTRAIN GROUP
TONAWANDA ENGINE PLANT

SOILS MANAGEMENT PLAN

HAUL ROUTE

CONESTOGA-ROVERS & ASSOCIATES

Drawn by: JLL	Scale: AS SHOWN	Date: APRIL 2001	File No: GN-008	Rev. No: 1
Designed by: JLL	Field book:	Project No: 17177-50	Drawing No: 9	
Checked by: DJH				