PROPOSED REMEDIAL ACTION PLAN
Former Bouchard Junkyard

Town of New Lebanon, Columbia County, New York
Site No. 411014

January 2004

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Former Bouchard Junkyard. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, general operation of the junkyard and the presumed spraying of oil for dust/weed control have resulted in the disposal of hazardous wastes, including PCBs, semi-volatile organic contaminants (SVOCs), and metals. These wastes have contaminated the soil and sediment at the site, and have resulted in:

- a significant threat to human health associated with current exposure to soil.
- an environmental threat related to the impacts of contaminants to the sediment in Wyomanock Creek and its tributaries.

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

- Excavate up to 28,000 cubic yards of surface soil contaminated with PCBs greater than one part per million (from the surface to a depth of eighteen inches), 2,700 cubic yards of subsurface soil with PCBs greater than ten parts per million (depth greater than eighteen inches), and 3,800 cubic yards of aquatic sediments with PCBs greater than one part per million.
- Large rocks and gravel from the excavated materials would be physically separated, since the contaminants are primarily associated with the fraction of soil which contains fine sand, silt, and clay (the "fines").
- The fines would be treated using soil washing, where water and a surfactant would strip the contaminants from the fines. A surfactant is a substance, like detergent, which makes it easier to remove a contaminant bound to the soil.
- The cleaned soil, along with the previously removed rocks and gravel, would be tested and, if clean, would be backfilled on-site. If concentrations of contaminants above cleanup goals remain, the soil would be re-treated as necessary.
- Since soil washing is a relatively new technology for use with PCBs, a pilot test would be performed to determine if the site's characteristics are appropriate for this technology. Additionally, this study would determine the surfactant or combination of

surfactants which would best remove the PCBs.

- In the event that soil washing would not be effective at cleaning the soil, an alternate remedy of thermal separation/desorption would be selected.

- If thermal separation is used, soil would be excavated and heated to a temperature high enough to drive off the contaminants. Hot gases would be collected and processed to remove the contaminants and the clean soil would be backfilled on the site.

- With either soil washing or thermal separation, there would be short-term monitoring of groundwater and surface water to confirm that the remedy was effective in cleaning up the site.

- Environmental easements would be placed on the property to limit excavation on the site, and an approved soil management plan would be developed to address residual contaminated soils that may be excavated from the site during future development. The property owner would complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would contain certification that the institutional controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

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

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

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the August 2002 "Remedial Investigation Report" (RI), the April 2003 "Feasibility Study Report" (FS), and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

New Lebanon Library
Box 630
New Lebanon, NY 12125
Hours: Monday, Tuesday, Wednesday, and Friday 10:00 - 6:00, Thursday 10:00 - 8:00, Saturday 9:30 - 3:00.
(518) 794-8844

New Lebanon Town Hall
Box 328
New Lebanon, NY 12125
Hours: Monday, Wednesday, and Thursday 9:00 - 3:00, Friday 4:00 - 7:00.
Appointment requested; contact Colleen Teal at (518) 794-8889

NYSDEC Region 4 Office
1150 North Westcott Road
Schenectady, NY 12306
Hours: Monday - Friday 8:30 - 4:00

Appointment requested; contact Alan Geisendorfer at (518) 357-2390

NYSDEC Central Office
625 Broadway, 12th Floor
Albany, NY 12233-7013
Hours: Monday - Friday 8:30 - 4:30
Appointment requested; contact Larry Alden, Project Manager, at (518) 402-9813

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from January 30, 2004 through February 28, 2004 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for February 19, 2004 at the New Lebanon Town Hall, beginning at 7:00 p.m.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. Alden at the above address through February 28, 2004.

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

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

SECTION 2: SITE LOCATION AND DESCRIPTION

The approximately 17-acre property is an irregularly shaped parcel of land that is relatively flat with a gentle downward slope to the southeast. Topographic relief across the site is approximately 25 feet. The site is located in a rural community near the intersection of US Route 20 and New York State Route 22 (see Figure 1). The site is bounded on the north and east by Lovers Lane, on the south by US Route 20, and on the west by private residential property (see Figure 2). An abandoned railroad bed formerly bisected the site from west to east, but the only indication of it now exists on properties east and west of the site. Wyomanock Creek, a New York State Class C (TS) stream, is located southwest of the site and flows from southeast to northwest. Tributaries flow from north to south along the eastern and western boundaries of the site.

Three buildings are currently located at the site. At the time of the investigation, these buildings were rented by three businesses and occupied by employees and customers during business hours. The businesses were a theater group, automobile repair shop, and engineering company. The remainder of the property has been utilized as farmland but is not currently used for agricultural purposes. South of the property, across US Route 20, are a construction company and residential properties. Residential properties are located to the north, east, and west of the site. Agricultural lands are situated to the northwest. This area is served by private homeowner wells.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Former Bouchard Junkyard site is the location of a former automobile junkyard operated from before 1959 through February 1969 by Mr. Henri Bouchard. Mr. Edward Weisberg purchased the property from the widow of Mr. Bouchard in February 1969, and continued its use as a junkyard. The junkyard was ordered closed in 1971 for operating without a licence. All salvage was removed from the site in the late 1970s.

In July 1998, General Electric (GE) provided NYSDEC with an internal memorandum dated October 10, 1980, suggesting that drums of oil and pyranol (polychlorinated biphenyls or PCBs) had either been disposed or burned at the site. The property was purchased by the current property owner, Mr. Ralph Chittenden, in 1985. Since the removal of the junk cars, a theater group, automobile repair shop, and engineering company were tenants in the three buildings on-site, however, prior to GE's notification, much of the property not occupied by buildings was utilized as farmland.

Historic aerial photographs indicate that the junk cars were placed in well-organized rows covering the majority of the site during the operation of the junkyard. The aerial photographs also suggest that the area at the east side of the site, behind the current Theater Barn building was filled some time before 1959. Apparent burn areas at the site can be observed in the aerial photographs. It has been reported that a metal fence was constructed in 1969 at the southern boundary of the junkyard on the north side of US Route 20. The automobile repair shop which operates at the site is located in the building that formerly served as the junkyard building. The buildings for the theater group and engineering company were constructed in 1989 and 1990, respectively. Some contaminated soil excavated during construction of these buildings was used as fill on a residential property just west of the former junkyard. This area of contamination is considered part of the site, even though it is on a different tax parcel.

3.2: <u>Remedial History</u>

In 2000, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In September 1998, the NYSDEC collected surface and subsurface soil samples from across the site and from the burn areas identified in the aerial photographs. Water samples from private water supply wells on or near the property were also collected. The sampling results showed widespread PCB contamination in the soil across the site. Following this sampling program, discussions ensued between NYSDEC and GE regarding continuing studies at the site, but the parties could not reach agreement and the site was referred for State Superfund action on November 30, 2000.

SECTION 4: <u>ENFORCEMENT STATUS</u>

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

The Bouchard Junkyard site was a former automobile junkyard operated from before 1959 through February 1969 by Mr. Bouchard, and through 1971 by Mr. Weisberg. According to a 1980 internal "memo to file" that General Electric provided to the NYSDEC, drums containing oil and pyranol from GE's Pittsfield facility were burned or disposed at a "dump" in New Lebanon operated by Mr. Bouchard.

No agreement could be reached with any PRP to perform the RI/FS. After the remedy is selected, any PRPs will be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the NYSDEC will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 5: <u>SITE CONTAMINATION</u>

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

5.1: <u>Summary of the Remedial Investigation</u>

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between October 2001 and November 2001 with additional samples collected in May 2002. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Research of historical information;
- Geophysical survey to locate buried metallic objects;
- Excavation of thirty-four test pits to investigate areas identified in the geophysical survey;
- Installation of six soil borings and monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Collection of two rounds of water samples from the six new monitoring wells and five private water supply wells;
- Collection of soil samples from more than 259 locations on and near the site;
- Collection of two rounds of surface water samples from seven locations;
- Collection of thirteen aquatic sediment samples;

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

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".
- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

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

5.1.1: <u>Site Geology and Hydrogeology</u>

Local natural land surface is at a high near the north end of the site with elevation of 713 feet above mean sea level. The natural land surface of the site decreases gently in elevation to the southeast reaching an elevation of 688 feet above mean sea level at the southeast end of the site. This 25-foot change in elevation occurs over a horizontal distance of about 1,100 feet and defines an overall slope of 2.3 percent.

Surface water drainage at the site consists of two small unnamed tributaries that flow from north to south along the eastern and western boundaries of the site. The on-site tributaries flow into Wyomanock

Creek, a New York State Class C (TS) stream, located to the south of the site across US Route 20. Shaker Swamp is also located across US Route 20 to the south and southeast of the site. Shaker Swamp is a NYSDEC designated Class 1 (CA-4) wetland.

Wyomanock Creek flows from southeast to northwest in the vicinity of the site and drains into Kinderhook Creek approximately 3.2 miles west of the site. Kinderhook Creek flows west into the Hudson River.

A north-south oriented ditch located at the south central portion of the site collects runoff from the parking lot and buildings and is a tributary to Wyomanock Creek. A second ditch forming the perimeter of a farm field originates adjacent to the northwest corner of the site and follows the western boundary of the property until it flows southward beneath US Route 20 and offsite. During the period of the field investigation from October through November 2001, no surface water was observed in either of these ditches.

Unconsolidated deposits at the site consist of coarse to fine gravels with sand. These deposits are associated with proglacial fluvial deposition and are generally well rounded and stratified. Based on 6 borings and 34 test pits ranging from 3.0 to 25.5 feet deep, overburden on the site consists predominantly of brown to gray, poorly sorted fine to coarse sand, fine to coarse gravel, and silt (0 to 14 feet below grade). A more uniform fine to medium sand with some silt layers was observed from 14 feet below grade to 25.5 feet below grade at monitoring well MW-1, which was the deepest boring advanced at the site. Glacially derived cobbles and boulder-sized rock fragments were observed during the excavation of test pits.

Little is known about the geology or hydrogeology of the bedrock at the site. The deepest boring advanced during this investigation was terminated at a depth of 25.5 feet below grade. Bedrock at the site is approximately 90 feet deep based on the well log of a water supply well at the site.

The first occurrence of groundwater or saturated conditions is in the overburden layer. Water level monitoring of the wells indicates that the depth of groundwater in the wells averages 9.3 feet below ground surface with a range of 3.4 to 20.3 feet below ground surface. Precipitation falling on the site runs off-site to the perimeter ditches and streams or infiltrates downward through the unconsolidated materials. Where no ditches exist, shallow groundwater discharges create wetland areas adjacent to the site. One such area is located south of the site across US Route 20. Shallow groundwater that originates at the site flows off the site in a southwest direction. Figure 3 depicts a typical water table surface for the site.

5.1.2: <u>Nature of Contamination</u>

As described in the RI report, many soil, groundwater, and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are polychlorinated biphenyls (PCBs) and pesticides, semivolatile organic compounds (SVOCs), and inorganics (metals).

The PCB of concern is Aroclor 1260. Polychlorinated biphenyls are a family of chemicals which were blended in different combinations (called Aroclors) according to their desired properties. Aroclor 1260 is a mixture of PCBs with a higher chlorine content. PCBs show a strong affinity to organic material, and so have essentially remained bound up in the upper soil layers. PCBs are not readily dissolved in water and are thus not expected to be found in groundwater or surface water unless associated with fine-grained material suspended in these media.

A number of pesticides were reported as detected in soil samples collected at the site. However, there is a strong correlation between the pesticide detections and the Aroclor 1260 detections, and it is probable that these results are false positives resulting from interference with the chemical pattern of Aroclor 1260 during the chemical analyses.

SVOCs present at the site are primarily polyaromatic hydrocarbons (PAHs). PAHs are commonly associated with bituminous materials, such as asphalt pavement, or combustion. PAHs may occur at various areas across the site due to the former railroad bed or burning of automotive waste materials. On the Bouchard Junkyard site, PAHs do not occur in areas where the soil is not also contaminated with PCBs.

A number of metals are included in the chemical analyses of the environmental samples collected from the site. Metals occur naturally in soil and water at various concentrations. Simply because a metal is detected in an environmental sample does not automatically mean that it is a contaminant. Metal concentrations in the analytical samples are compared to levels commonly found in the region or in samples from locations near the site, but not affected by it (background samples). In many cases, even background samples collected for this site had metals concentrations above SGCs.

5.1.3: <u>Extent of Contamination</u>

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

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

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

Surface Soil (0-1.5 feet)

Based on the results of the remedial investigation, the contaminants of concern for the surface soils at the Bouchard Junkyard site are PCBs and, to a lesser extent, SVOCs and metals (see Figure 4). Waste oil containing PCBs was thought to have been spread at the site as a means of dust control and weed control. Sampling of surface soils throughout the site showed exceedances of the SCG for PCBs (1 ppm) and indicated widespread occurrence of PCBs (Aroclor 1260) across the entire site (see Figure 5). A maximum PCB concentration of 1,200 ppm occurred at the southern boundary of the site, approximately twenty feet from US Route 20. Other PCB hot spots with concentrations greater than 50 ppm (the NYS hazardous waste threshold concentration) occurred in the central portion of the site. Surface soil samples from a parcel immediately west of the site, formerly owned by Mr. Bouchard, exceeded the SCG for PCBs. PCBs in concentrations of 50 ppm or greater are defined as hazardous waste. The surface soil cleanup goal is 1 ppm, thus, PCB concentrations in the surface soil at the site represent a significant threat to human health. It is estimated that up to 28,000 cubic yards of surface soil exceed the SCG of 1 ppm PCBs.

Pesticides were found above SCGs in surface soil samples, but as described previously, these are believed to be false positives.

Individual SVOC exceedances occurred at various areas across the site. Ten offsite surface soil samples were analyzed for SVOCs and two slightly exceeded the SCG for one PAH.

A number of metals (antimony, arsenic, barium, beryllium, calcium, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, sodium, thallium, and zinc) were detected above SCGs in surface soil, however, the concentrations were generally within published background concentrations for the eastern United States.

Subsurface Soil (1.5-5 feet)

Subsurface soil contaminants include PCBs and SVOCs and, to a lesser extent, metals (see Figure 6). The SCG for PCBs in subsurface soil (10 ppm) was exceeded at isolated portions of the site. Six subsurface soil samples exhibited total PCB concentrations greater than 50 ppm (the NYS hazardous waste threshold concentration), with a maximum concentration of 260 ppm. Most subsurface soil samples exceeding SCGs for PCBs underlie surface soils with concentrations of PCBs greater than 10 ppm and all underlie surface soils with concentrations of PCBs greater than 1 ppm. It is estimated that there are 2,700 cubic yards of subsurface soil exceeding the 10 ppm SCG for subsurface PCBs.

Individual SVOCs exceeding SCGs were detected in subsurface soil samples that were collected throughout the site.

A number of metals (aluminum, antimony, arsenic, beryllium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, and zinc) were detected above SCGs in subsurface soil samples, however, the concentrations were generally within published background concentrations for the eastern United States. SCGs and published background concentrations were slightly exceeded for aluminum, antimony, copper, lead, nickel and silver in one subsurface soil sample collected from a test pit containing scrap metal and debris associated with the junkyard. Selenium was detected in one subsurface soil sample at a concentration slightly above both the SCG and published background concentrations and appears to be an isolated occurrence. Pesticides, believed to be false positives, exceeded compound-specific SCGs in subsurface soil samples collected from the site. SCGs were slightly exceeded for acetone in one subsurface soil sample, but no other VOCs were identified in concentrations above SCGs. The detection of acetone is considered isolated and unrelated to other site contaminants.

Sediments

Aquatic sediment contaminants included PCBs and pesticides, and, to a lesser extent, SVOCs and metals (refer to Figure 7). PCBs were detected above SCGs in sediment samples collected from on-site and downgradient off-site locations. Pesticides were detected above SCGs in samples collected at an on-site location (northwest corner), immediately adjacent to the site (east side) and downgradient on-site location (south central). The same pesticide compounds were also detected in on-site surface soil samples and are likely false positives.

SVOCs, which were comprised entirely of PAHs, were detected above SCGs in sediment samples collected from upgradient and downgradient off-site locations and locations immediately adjacent to roadways. SVOCs were also present in site soils, however, several of these SVOCs were also detected in upgradient samples. The occurrence of these SVOCs does not for the most part appear site-related.

Metals were detected above SCGs in each of the thirteen sediment samples. These metals included antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc. These metals were detected in sediment samples collected at upgradient and downgradient off-site locations. Although some of these metals did not exceed SCGs for upgradient sediment samples, they did occur in off-site background surface soil samples as well as on-site surface soil samples. As a result, metals in sediment may in part be attributable to on-site contamination. Sediment samples contained no exceedances of SCGs for VOCs or cyanide.

Groundwater/Water Supply

Groundwater samples contained PCBs and to a lesser extent metals (see Figure 8). Shallow groundwater (averaging approximately nine feet below ground surface) collected from six monitoring wells at the site in November 2001 contained no exceedances of SCGs for VOCs, SVOCs, pesticides, PCBs, or cyanide. A second round of shallow groundwater samples collected from the six monitoring wells in May 2002 contained one sample where the groundwater standard of 0.09 ppb was slightly exceeded for PCBs. This sample was collected from a well located in the central portion of the site where surface soil and subsurface soil exceedances of PCB SCGs exist.

Metals were detected above SCGs, however, the concentrations of these metals in upgradient and downgradient samples were similar and did not appear to increase in the direction of groundwater flow and, therefore, likely represent background conditions.

Water supply well contamination is not a concern at the site based on the results of the remedial investigation. Samples were collected from five water supply wells at or adjacent to the site in November 2001. SCGs were exceeded for one VOC (tetrachloroethene at a concentration of 44 ppb) in one sample collected from the well at the automotive repair shop. A second round of samples collected from the five water supply wells in May 2002 contained no exceedances of SCGs.
Iron and manganese were the only metals detected above SCGs and exhibit similar concentrations at up- and downgradient wells. These metals most likely occur naturally in the area.

Surface Water

Surface water contamination is not a major concern at the site based on the results of the remedial investigation. Two rounds of surface water samples were collected from five locations in the stream located to the east of the site. One round of surface water samples was collected from two locations from the stream channel to the west of the site (see Figure 9). No VOCs, SVOCs or PCBs were detected above SCGs in any of these surface water samples.

Several metals (aluminum, cobalt, copper, iron, selenium, silver, thallium, and zinc) were found above SCGs in an upgradient sample location, as well as two locations adjacent to the site. It is likely that these metals were naturally occurring and not site-related. Two metals, mercury and vanadium, exceeded SCGs in two surface water samples collected in October 2001 from locations adjacent to the site, however, these metals did not exceed SCGs in downgradient samples and the SCGs for mercury and vanadium were not exceeded in any of the surface water samples collected in May 2002.

SCGs were slightly exceeded for cyanide in two of the surface water samples collected. Cyanide did not exceed SCGs in surface or subsurface soil samples collected from the site. The detection of cyanide in surface water is considered isolated and unrelated to other site contaminants.

SCGs were slightly exceeded for heptachlor epoxide in one of the surface water samples that was collected. Heptachlor epoxide did not exceed SCGs in any other media sampled at the site and the exceedance for this pesticide was in the sample collected from an upgradient off-site location.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

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

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6 of the RI report.

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

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

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

Potential Human Exposure Pathways

- Dermal contact, inhalation, and incidental ingestion exposures to PCBs in surface soil by workers and patrons of the existing on-site businesses. Those exposures are thought to be minimal due to the nature of the facilities.

- Dermal contact, inhalation, and incidental ingestion exposures to PCBs in surface soil by residents of the residential property where contaminated soil from the former junkyard was used for fill.

- Dermal contact, inhalation, and incidental ingestion exposures to PCBs in surface soil by future occupants of the property.

- Direct contact, inhalation, and incidental ingestion exposures to future utility workers who may excavate and handle contaminated soil on- or off-site.

5.4: Summary of Environmental Impacts

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

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

- Fish and wildlife communities could be exposed to site-related contaminants present in the shallow soils by several mechanisms: direct ingestion of soil, acute or chronic toxicity to soil organisms, vegetative uptake of contaminants from soil and related food web effects, and food web effects of ingesting soil organisms containing elevated body burden of contaminants.

- Concentrations of SVOCs, several metals, and PCBs (Aroclor 1260) in aquatic sediments exceed the NYSDEC sediment quality criteria. Fish and wildlife communities could be exposed to site-related contaminants present in the aquatic sediments by several mechanisms: acute or chronic toxicity to benthic organisms (macroinvertebrates), and accumulation and concentration through the food web to fish and fish-eating birds and mammals.

Wyomanock Creek provides valuable fish habitat. The other surface water resources on the site provide only limited habitat value due to their intermittent nature and lack of riparian cover.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

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

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

- direct contact (dermal absorption, inhalation, and incidental ingestion) with surface and subsurface soil, and;
- migration by runoff of contaminants to surface water and sediment, and;
- infiltration of precipitation through contaminated soil and adverse impacts to groundwater, and;
- exposure of biota to contaminated sediment.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

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

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. A discount rate of 5% was used for this site. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The Feasibility Study identified Bioremediation as a viable alternative to address contaminated soil at this site, but the NYSDEC has removed it from further consideration because bioremediation has not proved to be an effective remedy for PCB-contaminated soil.

The following potential remedies were considered to address the contaminated soil and sediment at the site.

Alternative 1: No Action

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

Present Worth: *$153,000*
Capital Cost: *$0*
Annual OM&M (Years 1-5): *$22,000*
Annual OM&M (Years 6-30): *$5,000*

Alternative 2: Hot Spot Removal and Permeable Cover with Monitoring

This alternative would include excavating soils with PCB concentrations exceeding 50 ppm for off-site disposal followed by placement of a 24-inch permeable soil cover over the approximately 16 acres of contaminated surface soil. Approximately 2,300 cubic yards of surface soil (to a depth of 1.0 foot below grade) would be removed. In addition, subsurface soil requiring removal would include approximately 100 cubic yards from 1.0 to 2.5 feet below grade. This would result in a total of about 2,400 cubic yards of soil that would require off-site disposal as hazardous waste. All excavated areas would be backfilled with clean soil to existing grade. The soil cover over approximately 16 acres would consist of 18 inches of general fill and 6 inches of topsoil to mitigate contact with and runoff of contaminated soil. Approximately 37,000 cubic yards of general fill and 12,000 cubic yards of topsoil would be required to implement this alternative. Placement of a 24-inch permeable soil cover would affect the grade of the site and may not be practical at areas around structures at the site.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing, would be required to minimize the release of soil and sediment to downstream surface waters. Long-term groundwater and surface water monitoring and institutional controls (environmental easements) are also included as part of this alternative to evaluate the effectiveness of the soil cover and to control use of the site. Maintenance of this alternative would include site inspections and cutting of the vegetated cover.

This alternative would take six months for design and three months to implement. Because PCBs would remain on-site beneath the permeable soil cap, the third remedial goal of reducing infiltration would only partially be met. Additionally, this alternative would not address the contaminated sediments at the site.

Present Worth: *$1,962,000*
Capital Cost: *$1,633,000*
Annual OM&M (Years 1-5): *$33,000*
Annual OM&M (Years 6-30): *$17,000*

Alternative 3: Ex-Situ Soil Washing with Short-term Monitoring

Soil washing would involve excavation of all soil and sediment exceeding SCGs (refer to Figure 5). It is estimated that a total of 34,500 cubic yards of soil (28,000 cubic yards of surface soil [PCBs greater than one ppm] from grade to eighteen inches below grade, 2,700 cubic yards of subsurface soil [PCBs greater than 10 ppm] greater than eighteen inches below grade, and 3,800 cubic yards of sediment [PCBs greater than 1 ppm - assumes an area of 100 feet by 500 feet by 2 feet deep]) would require treatment. Subsequent to excavation, physical separation of soils would be performed so that the contaminants, which are primarily associated with the fine size fraction of the soil, would be separated from the uncontaminated larger size fraction. The washing fluid would be composed of water and a surfactant capable of removing the contaminants from the soil.

A liquid-solid separation would be performed where the fluid could leach the contaminants.

The soil washing process would result in clean soil, wash water, dissolved contaminants, and/or precipitated solids, and a finer fraction containing adsorbed organics and precipitated soils. The contaminants would be concentrated into a relatively small volume of material, which would be disposed off-site. Treated soil and the previously removed larger size fraction of the soil would be analyzed to confirm that contaminants have been removed to below SCGs and this material would be used to backfill excavated areas. Additional clean backfill would be brought to the site to return the site to original grades.

Treatment of contaminated soil and sediment at the site would require approximately 700,000 gallons of water. Since a municipal water source does not exist for this site, water would need to be delivered to the site or on-site groundwater resources would need to be utilized. Water used during the soil washing process would be treated and re-used, then ultimately disposed off-site at a hazardous waste disposal facility.

Controls would need to be implemented during the excavation and physical separation of the soil and sediment prior to actually performing the soil washing process to prevent the airborne release of contaminants. These controls would most likely include water to control dust. Sediment control measures, such as silt fencing, would be required to minimize the release of soil and sediment to downstream surface waters.

After cleanup, short-term groundwater and surface water monitoring would include monitoring of six groundwater monitoring wells, three private water supply wells, and three surface water locations.

This alternative would take six months for design and 6 - 12 months to implement. It would attain all remedial goals when complete, but would require environmental easements and a soil management plan.

A bench scale and/or pilot study would be required to determine the effectiveness of this technology for this site.

Present Worth: $5,536,000
Capital Cost: $5,488,000
Annual OM&M (Years 1-5 only): $11,000

Alternative 4: Ex-Situ Soil Washing to 1 ppm with Short-term Monitoring

This alternative would be the same as Alternative 3 except that it would treat all contaminated soil with PCBs greater than 1 ppm, regardless of depth. This would mean that an additional 4,600 cubic yards of subsurface soil with PCB concentrations between 10 ppm and 1 ppm would be treated. All other assumptions for this alternative would be the same as with Alternative 3 except that environmental easements and a soil management plan would not be necessary.

Present Worth: $6,198,000
Capital Cost: $6,150,000
Annual OM&M (Years 1-5 only): $11,000

Alternative 5: Thermal Separation/ Desorption with Short-term Monitoring

Thermal separation would involve excavation and treatment of all soil and sediment exceeding SCGs. As with Alternative 3, 34,500 cubic yards of contaminated soil and sediment would require treatment. Subsequent to excavation, soil and sediment would be placed into a hopper that feeds the thermal processor. Soil would be heated to 400 to 500 °F to remove moisture. A second stage heater would be capable of achieving temperatures to 1,000 °F to remove the contaminants. Water would be applied to the soil exiting the thermal processor to cool the soil and minimize dust. Desorbed organics and stack gases would exit the processor through a fabric filter baghouse, air-cooled condenser, refrigerated condenser, and then be treated by carbon absorption. Treated soil would be analyzed to confirm that the contaminants have been removed to levels below SCGs and then this material would be used to backfill excavated areas. Additional clean backfill would be brought to the site to return the site to original grades, as needed.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing, would be required to minimize the release of soil and sediment to downstream surface waters. Groundwater and surface water monitoring would include monitoring of six groundwater monitoring wells, three private water supply wells, and three surface water locations.

This alternative would take nine months for design and 12 - 15 months to implement. It would attain remedial goals when complete, but would require environmental easements and a soil management plan.

A bench scale and/or pilot study would be required to determine the effectiveness of this technology for this site.

Present Worth: *$7,162,000*
Capital Cost: *$7,114,000*
Annual OM&M (Years 1-5 only): *$11,000*

Alternative 6: Excavation and Off-Site Disposal

Soil exceeding SCGs would be excavated from the site. Approximately 28,000 cubic yards of surface soil (to a depth of eighteen inches below grade) would require removal. In addition, subsurface soil requiring removal would include 300 cubic yards from 1.5 to 2.5 feet below grade and 2,400 cubic yards from 1.5 to 5.0 feet below grade. Approximately 3,800 cubic yards of sediment would be excavated as well. This would result in about 34,500 cubic yards of soil and sediment that would require off-site disposal. All excavated areas would be backfilled with clean soil to existing grade.

Appropriate precautions would be taken during excavation of contaminated soil to mitigate dust from migrating off-site and/or impacting on-site workers. It is anticipated that water would be adequate to control dust. Sediment control measures, such as silt fencing, would be required to minimize the release of soil and sediment to downstream surface waters. Groundwater and surface water monitoring would include monitoring of six groundwater monitoring wells, three private water supply wells, and three surface water locations.

This alternative would take six months for design and three months to implement. It would attain remedial goals when complete, but would require environmental easements and a soil management plan.

Present Worth: *$7,106,000*
Capital Cost: *$7,058,000*
Annual OM&M (Years 1-5 only): *$11,000*

7.2 Evaluation of Remedial Alternatives

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

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

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

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

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

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

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

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

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

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

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

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing Alternative 3, Ex-Situ Soil Washing with Short-term Monitoring, as the remedy for this site. As a backup technology, Alternative 5, Thermal Separation/Desorption with Short-term Monitoring, would be implemented if preliminary testing shows site conditions are not conducive to soil washing or its use is ineffective. The elements of these remedies are described at the end of this section.

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

Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by treating the soils that present the most significant threat to public health and the environment. Treatment of the soil to remove the contaminants would take away the direct contact threat and eliminate the migration of contaminants via runoff. Since contaminants would be removed, infiltration of precipitation through the soil would no longer pose a threat to groundwater or water supply wells.

Alternatives 2 (hot spot removal and soil cover), 4 (soil washing to 1 ppm), 5 (thermal separation), and 6 (excavation and removal) would also comply with the threshold selection criteria. Although Alternative 2 would leave PCBs in subsurface soil greater than the 10 ppm guidance value, the soil cover and environmental easements would prevent contact with contaminated soil. Alternative 1 (no action) would not comply with the criteria.

Because Alternatives 3, 4, 5, and 6 all equally satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 and 6 would have short-term impacts on the community due to the increased truck traffic needed to remove contaminated soil and bring cap or backfill material to the site. Alternatives 2, 3, 4, 5, and 6 would all involve some sort of disturbance of the soil, which could generate dust or runoff. However, these aspects could be controlled by proper use of dust suppressants and erosion controls. Activities associated with Alternatives 3, 4, and 5 would be largely confined to the site.

The time needed to achieve the remediation goals would be shortest for Alternatives 2 and 6 and longer for Alternatives 3, 4, and 5.

Long-term effectiveness is best accomplished by those alternatives that address the contamination at the site, either through outright removal (Alternative 6) or by treatment (Alternatives 3, 4, and 5). Alternative 2 would remove the most highly contaminated soils, but would leave lower concentrations at the site beneath a soil cap.

Alternative 2 (hot spot removal and soil cover), would do little to reduce the toxicity, mobility, or volume of hazardous waste through treatment. Removal of 2,400 cubic yards of soil with PCBs greater than 50 ppm would be the only reduction of volume on the site under that alternative. Alternatives 3 and 4 (soil washing) and, in part, Alternative 5 (thermal separation) would concentrate the contaminants so they could be removed, thus reducing the volume of contaminants at the site. Alternative 5 would also reduce the toxicity, mobility, and volume in part through physical treatment by destroying the contaminants.

As with Alternatives 2, 3, 4, and 5, excavation and removal (Alternative 6) would reduce the toxicity, mobility, and volume of the waste relative to the site, but since the soils would be untreated before disposal, the toxicity, mobility, and volume of hazardous waste would not be reduced overall.

Alternatives 3, 5, and 6 would not result in removal of all of the contaminants at the site, but low residual concentrations remaining after treatment would be below the SCGs and would be protective of human health with proper environmental easements. Alternative 4 would allow unrestricted use of the property after remediation because all soils would be treated to below 1 ppm PCBs.

Alternatives 2, 3, 4, 5, and 6 are readily implementable, though bench-scale testing or other pilot testing would be required with Alternatives 3, 4, and 5 before they could be fully implemented.

The cost of the alternatives varies significantly. Although hot spot removal with soil cover (Alternative 2) is less expensive than soil washing (Alternative 3), hot spot removal is not a permanent remedy. The increased volume of soil that would be treated for Alternative 4 (soil washing to 1 ppm) increases the cost relative to Alternative 3. Thermal separation (Alternative 5) and excavation and removal (Alternative 6) are the most costly remedies, though both are reliable and proven technologies. Because wastes would be removed from the site with Alternatives 3, 4, 5, and 6, either through straight removal or by treatment, the cost for operation, maintenance, and monitoring (OM&M) is much lower due to only five years of OM&M rather than the thirty years with the other alternatives.

Soil washing contaminated soil to a depth of 1.5 feet to 1 ppm (Alternative 3) is preferred over washing all soil with PCBs greater than 1 ppm (Alternative 4) due to the increased cost associated with Alternative 4. Since the contamination does not appear to be a threat to groundwater, Alternative 3, with institutional controls, would provide the same level of protection as Alternative 4 for a lower cost.

Because soil washing is a relatively untried technology for removal of PCBs from soil (though it appears that site conditions are favorable for it due to the low silt and clay content of the soil), the NYSDEC is identifying thermal separation (Alternative 5) as a backup technology in case soil washing proves ineffective. Thermal separation would involve a similar amount of disturbance at the site and is a proven technology for removal of PCBs from soil. It is, however, a more costly remedy.

Thermal separation would be selected as a secondary remedy over excavation and removal (Alternative 6) because of similar cost and the preference for treating the soil to reduce the toxicity, mobility, and volume of the contaminants over disposing it in a secure landfill. It would also allow the site to be used, within the bounds spelled out in the environmental easements, without the need to transport and place a large volume of off-site backfill.

The estimated present worth cost to implement the remedy is $5,536,000 ($7,162,000 for the backup technology). The cost to construct the remedy is estimated to be $5,488,000 ($7,114,000 for the backup) and the estimated average annual operation, maintenance, and monitoring costs for 5 years is $11,000 (both technologies).

The elements of the proposed remedy are as follows:

1. Samples of contaminated soil from the site would be collected for laboratory analysis to determine the soil and waste characteristics. Bench-scale tests would experiment with a number of different surfactants or combinations of surfactants to determine the best one to use to remove the contaminants present at the site. If it is determined that soil washing cannot adequately remove the PCBs from the soil, then thermal separation would be pursued as the remedial method. (In thermal separation, soil would be excavated and heated to drive off the contaminants. Hot gases would be collected and processed to remove the contaminants, and the clean soil would be backfilled on the site.)

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

3. Equipment would be mobilized on the site. Excavate and stockpile up to 28,000 cubic yards of surface soil contaminated with PCBs greater than one part per million (from the surface to a depth of eighteen inches), 2,700

cubic yards of subsurface soil with PCBs greater than ten parts per million (depth greater than eighteen inches), and 3,800 cubic yards of aquatic sediments with PCBs greater than one part per million.

4. The stockpiled soil would be screened to remove larger cobbles and gravel. Since the PCBs in the soil are associated with the fine-grained fraction of the soil, this step would decrease the volume of soil which would need to be processed further.

5. The finer-grained soil fraction would be mixed with water and a surfactant to strip the PCBs from the soil. Treated soil would be tested and, if clean (below 1 ppm PCBs), used for backfill on the property. Cleaned soil would be separated from soil with PCB concentrations between 1 and 10 ppm by a demarcation layer. If concentrations of contaminants above cleanup goals remain, the soil would be re-washed as necessary or removed for off-site disposal.

6. The water/surfactant mix would be treated to remove some of the contaminants, and the treated water would be reused in the washing process. Ultimately, the water would be disposed in a hazardous waste disposal facility.

7. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible.

8. The site would be restored by grading, placement of topsoil (if necessary), and seeding of excavated and/or filled areas.

9. A soils management plan would be developed to address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations.

10. An environmental easement would be imposed, in such form as the NYSDEC may approve, that would require compliance with the approved soils management plan.

    The property owner would complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would contain certification that the institutional controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

11. Under a monitoring program, water samples from on-site monitoring wells, water supply wells, and surface water would be collected for laboratory analysis. This program would allow the effectiveness of the soil washing process or thermal separation/desorption to be monitored and would be a component of the operation, maintenance, and monitoring for the site.

TABLE 1
Nature and Extent of Contamination
October 2001 - May 2002

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semivolatile Organic Compounds (SVOCs)	Hexachlorobenzene	ND - 0.820	0.410	1 of 21
	Benzo(a)pyrene	ND - 0.160	0.061	4 of 21
PCB/Pesticides	Aroclor 1260	ND - 1,200	1	34 of 52
	Aroclor 1248	ND - 28	1	1 of 52
	Dieldrin	ND - 4.2	0.044	7 of 28
	Endosulfan Sulfate	ND - 8.7	1	5 of 28
	4,4'-DDT	ND - 5.3	2.1	1 of 28
	Methoxychlor	ND - 24	10	2 of 28
	gamma-Chlordane	ND - 14	0.54	4 of 28
Inorganic Compounds	Antimony	ND - 10.1	1.0	4 of 21
	Arsenic	4.9 - 13.2	7.9	6 of 21
	Barium	37.4 - 653	300	2 of 21
	Beryllium	0.23 - 0.49	0.46	1 of 21
	Calcium	73.8 - 15,100	2,810	4 of 21
	Copper	18.2 - 461	38.3	5 of 21
	Iron	22,300 - 82,100	30,500	9 of 21
	Lead	18.9 - 1,150	400	2 of 21
	Magnesium	3,610 - 6,840	5,840	2 of 21
	Manganese	297 - 1,430	1,320	2 of 21
	Mercury	ND - 0.34	0.1	6 of 21
	Nickel	15.5 - 136	23.8	7 of 21
	Selenium	ND - 2.9	1.8	6 of 21
	Sodium	28.2 - 280	69.4	2 of 21
	Thallium	1.5 - 5.1	4.2	3 of 21
	Zinc	73.4 - 6,470	119	9 of 21

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Acetone	ND - 0.240	0.200	1 of 31
Semivolatile Organic Compounds (SVOCs)	Phenol	ND - 0.210	.030	1 of 31
	Benzo(a)anthracene	ND - 4.1	0.244	2 of 31
	Chrysene	ND - 4.1	0.400	2 of 31
	bis(2-Ethylhexyl)phthalate	ND - 180	50	1 of 31
	Benzo(b)fluoranthene	ND - 5.5	1.1	2 of 31
	Benzo(k)fluoranthene	ND - 1.5	1.1	1 of 31
	Benzo(a)pyrene	ND - 3.5	0.061	6 of 31
	Dibenzo(a,h)anthracene	ND - 0.270	0.014	2 of 31
PCB/Pesticides	Aroclor 1260	ND - 260	10	13 of 195
	Dieldrin	ND - 0.550	0.044	9 of 173
	Endosulfan Sulfate	ND - 2.7	1	4 of 173
	gamma-Chlordane	ND - 2.4	0.540	1 of 173
Inorganic Compounds	Aluminum	8,250 - 166,000	16,300	4 of 31
	Antimony	ND - 17.0	1.0	4 of 31
	Arsenic	ND - 12.5	7.9	6 of 31
	Beryllium	0.13 - 0.75	0.46	4 of 31
	Calcium	ND - 4,100	2,810	1 of 31
	Chromium	8.7 - 79.2	50	1 of 31
	Copper	3.6 - 6,950	38.3	9 of 31
	Iron	11,900 - 50,700	30,500	8 of 31
	Lead	5.7 - 3,460	400	1 of 31
	Magnesium	1,860 - 8,980	5,840	9 of 31
	Manganese	180 - 11,400	1,320	3 of 31
	Mercury	ND - 0.28	0.1	1 of 31
	Nickel	11.4 - 956	23.8	14 of 31
	Potassium	237 - 1,500	1,220	2 of 31

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Inorganic Compounds	Selenium	ND - 4.5	1.8	6 of 31
	Silver	ND - 2.9	ND	1 of 31
	Sodium	22.0 - 120	69.4	4 of 31
	Thallium	ND - 5.8	4.2	3 of 31
	Zinc	38.9 - 1,650	119	8 of 31

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND - 0.320	0.208[d]	2 of 13
	Chrysene	ND - 0.300	0.0225[d]	5 of 13
	Benzo(b)fluoranthene	ND - 0.490	0.0225[d]	5 of 13
	Benzo(k)fluoranthene	ND - 0.190	0.0225[d]	3 of 13
	Benzo(a)pyrene	ND - 0.260	0.0225[d]	4 of 13
	Indeno(1,2,3-cd)pyrene	ND - 0.110	0.0225[d]	2 of 13
PCB/Pesticides	Aroclor 1260	ND - 6.7	1	3 of 13
	Dieldrin	ND - 0.023	0.00173[d]	1 of 13
	4,4'-DDE	ND - 0.019	0.000173[d]	1 of 13
	Endrin	ND - 0.045	0.0138[d]	2 of 13
	4,4'-DDT	ND - 0.0073	0.000173[d]	1 of 13
	Methoxychlor	ND - 0.100	0.01038[d]	1 of 13
	gamma-Chlordane	ND - 0.081	0.0000173[d]	1 of 13
Inorganic Compounds	Antimony	ND - 2.4	LEL[c] - 2	1 of 13
			SEL[c] - 25	0 of 13
	Arsenic	3.0 - 11.1	LEL - 6	9 of 13
			SEL - 33	0 of 13
	Cadmium	ND - 5.1	LEL - 0.6	2 of 13
			SEL - 9	0 of 13
	Copper	12.8 - 39.9	LEL - 16	11 of 13

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Inorganic Compounds			SEL - 110	0 of 13
	Iron	16,400 - 37,800	LEL - 20,000	12 of 13
	Iron	16,400 - 37,800	SEL - 40,000	0 of 13
	Lead	7.6 - 118	LEL - 31	4 of 13
			SEL - 110	1 of 13
	Manganese	414 - 1,260	LEL - 460	12 of 13
			SEL - 1100	2 of 13
	Mercury	ND - 0.39	LEL - 0.15	3 of 13
			SEL - 1.3	0 of 13
	Nickel	16.6 - 28.6	LEL - 16	13 of 13
			SEL - 50	0 of 13
	Zinc	66.9 - 358	LEL - 120	4 of 13
			SEL -270	1 of 13

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Aroclor 1260	ND - 0.25	0.09	1 of 12
Inorganic Compounds	Iron	84.4 - 7,000	300	5 of 6
	Manganese	12 - 2,370	300	5 of 6
	Sodium	3,410 - 37,400	20,000	1 of 6
	Thallium	ND - 10.2	0.5	1 of 6

WATER SUPPLY	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND - 44	5	1 of 10
Inorganic Compounds	Iron	51.6 - 7,820	300	4 of 5
	Manganese	2.8 - 369	300	4 of 5

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Heptachlor Epoxide	ND - 0.037	0.00003	1 of 12
Inorganic Compounds	Aluminum	ND - 21,300	100	6 of 12
	Cobalt	0.46 - 39.5	5	3 of 12
	Copper	1.5 - 41.4	12.7[e]	5 of 12
	Iron	32.1 - 47,300	300	8 of 12
	Mercury	ND - 0.38	0.00007	2 of 12
	Selenium	ND - 6.0	4.6	5 of 12
	Silver	ND - 1.4	0.1	6 of 12
	Thallium	ND - 23.3	8	3 of 12
	Vanadium	ND - 47.0	14	2 of 12
	Zinc	ND - 296	111[e]	4 of 12
	Cyanide	ND - 19.1	5.2	2 of 12

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

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

[c] LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LEL is exceeded, the impact is considered to be moderate.

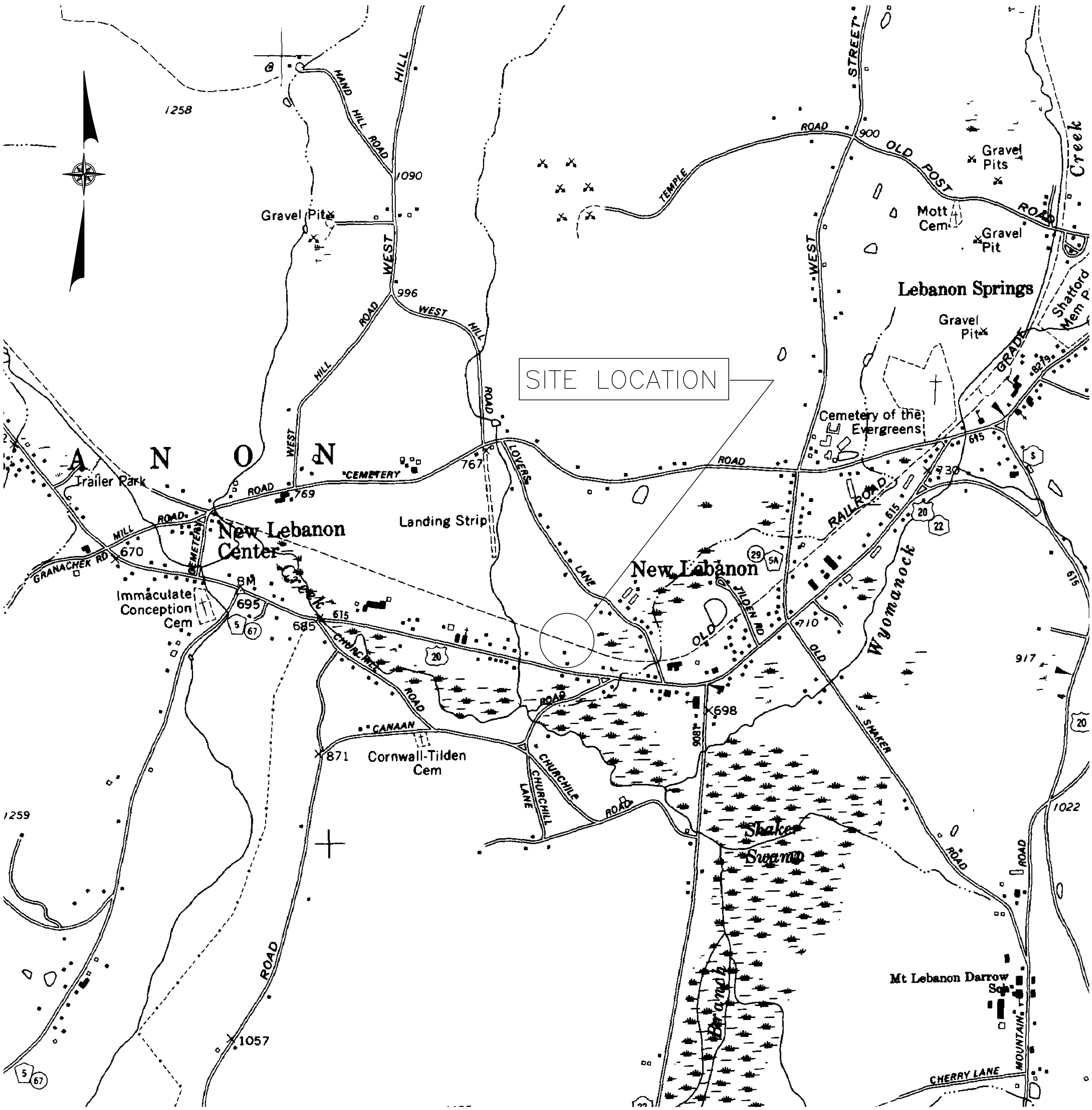
[d] SCGs for these contaminants in sediments are based on the organic carbon content of the samples. An average organic carbon content of 1.73% was used to illustrate an average sediment standard, but the number of samples exceeding the SCG was based on the organic carbon content of each individual sample.

[e] SCGs for these inorganics in surface water are dependent on the hardness of the water. An average hardness of 94 ppm was used to illustrate an average surface water standard, but the number of samples exceeding the SCG was based on the actual hardness of each individual sample.

ND = Not Detected

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
1. No Action	$0	$22,000 (years 1-5) $5,000 (years 6-30)	$153,000
2. Hot Spot Removal and Permeable Cover	$1,633,000	$33,000 (years 1-5) $17,000 (years 6-30)	$1,962,000
3. Soil Washing and Short-Term Monitoring	$5,488,000	$11,000 (years 1-5)	$5,536,000
4. Soil Washing to 1 ppm and Short-Term Monitoring	$6,150,000	$11,000 (years 1-5)	$6,198,000
5. Thermal Separation/Desorption and Short-Term Monitoring	$7,114,000	$11,000 (years 1-5)	$7,162,000
6. Excavation and Off-Site Disposal and Short-Term Monitoring	$7,058,000	$11,000 (years 1-5)	$7,106,000



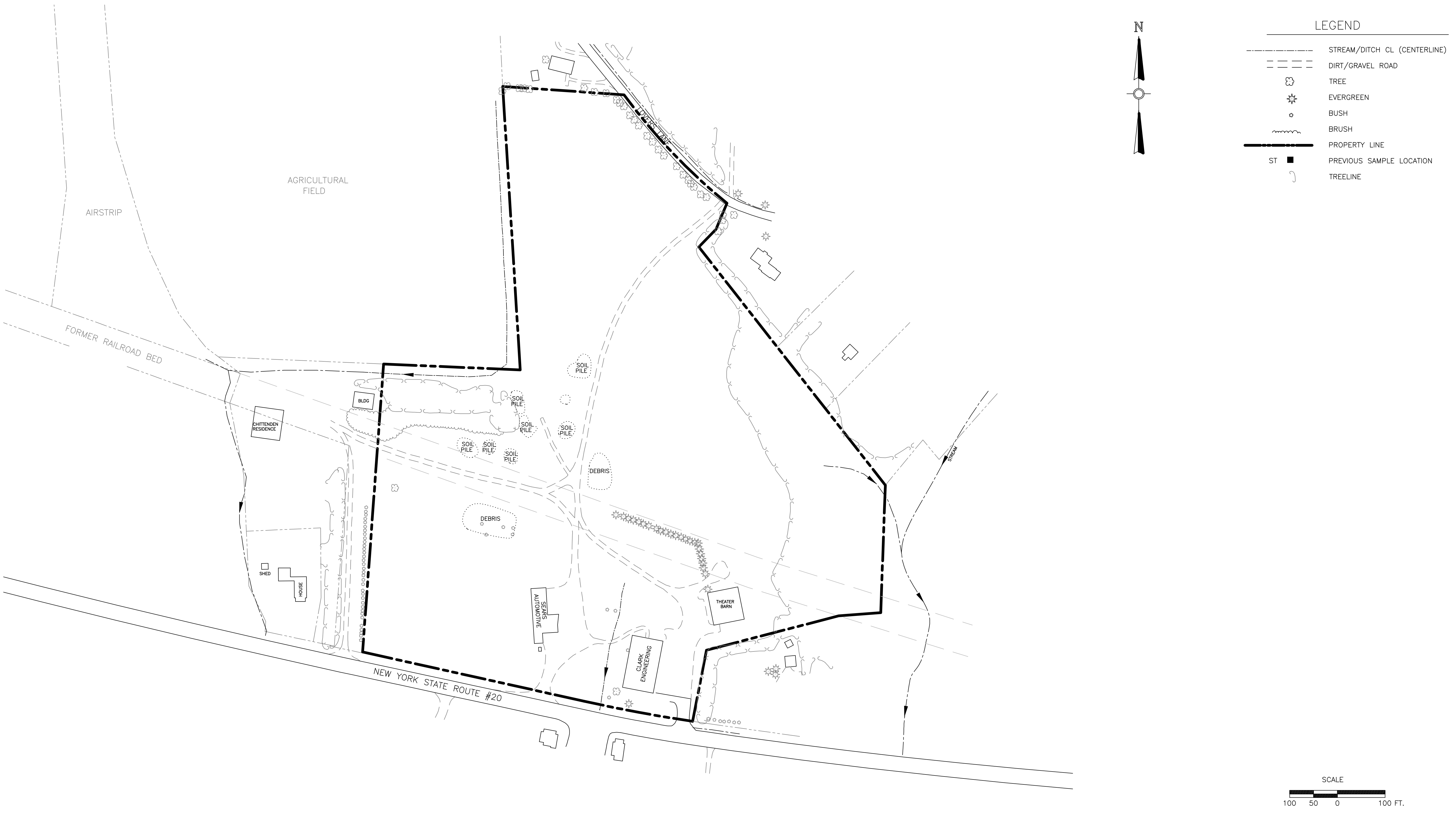
SOURCE: USGS CANAAN QUADRANGLE

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SITE LOCATION

Dvirka and Bartilucci
Consulting Engineers

FIGURE 1



BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SITE MAP

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FIGURE 2

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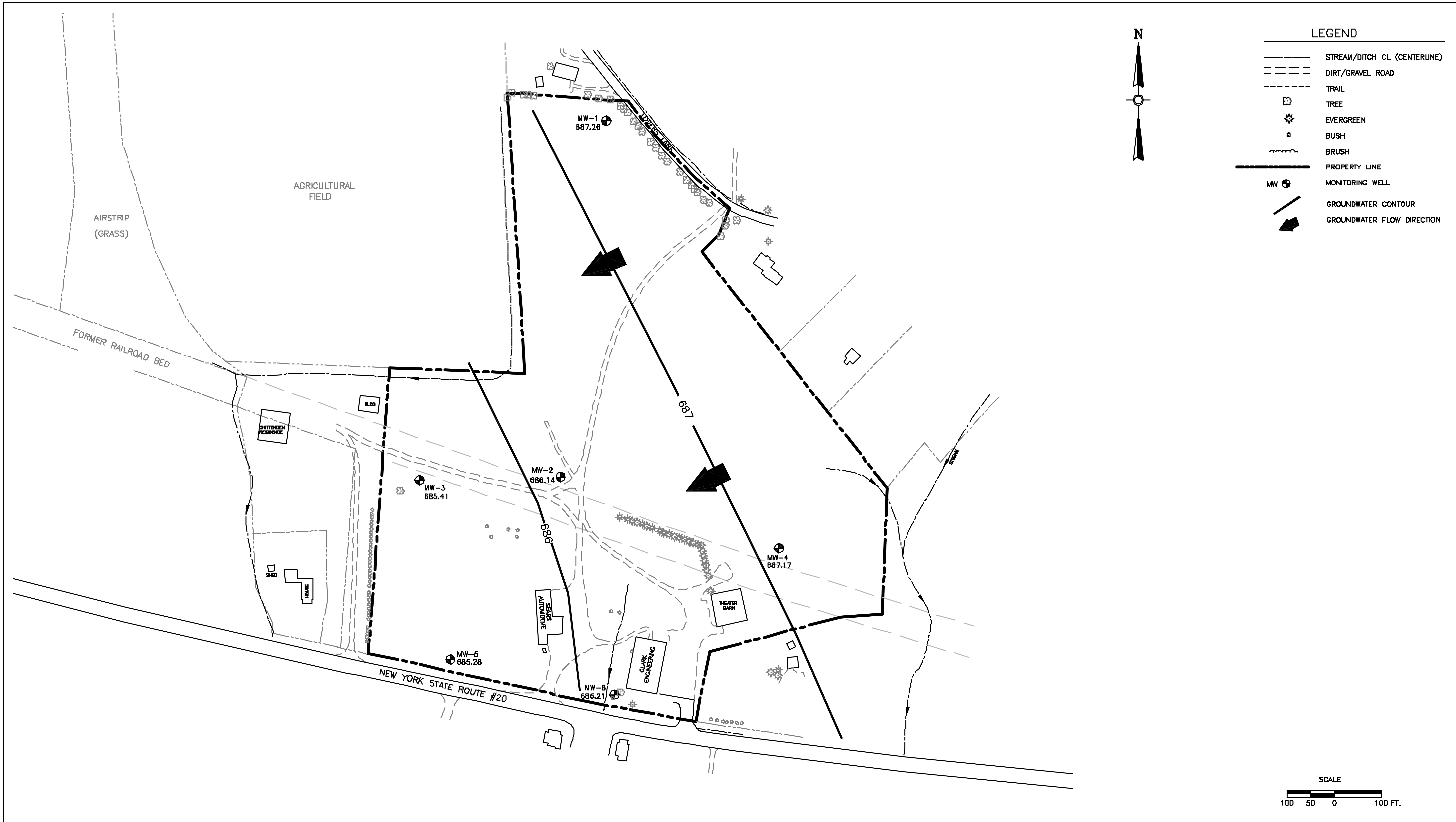
NOV 12, 2002 SEP

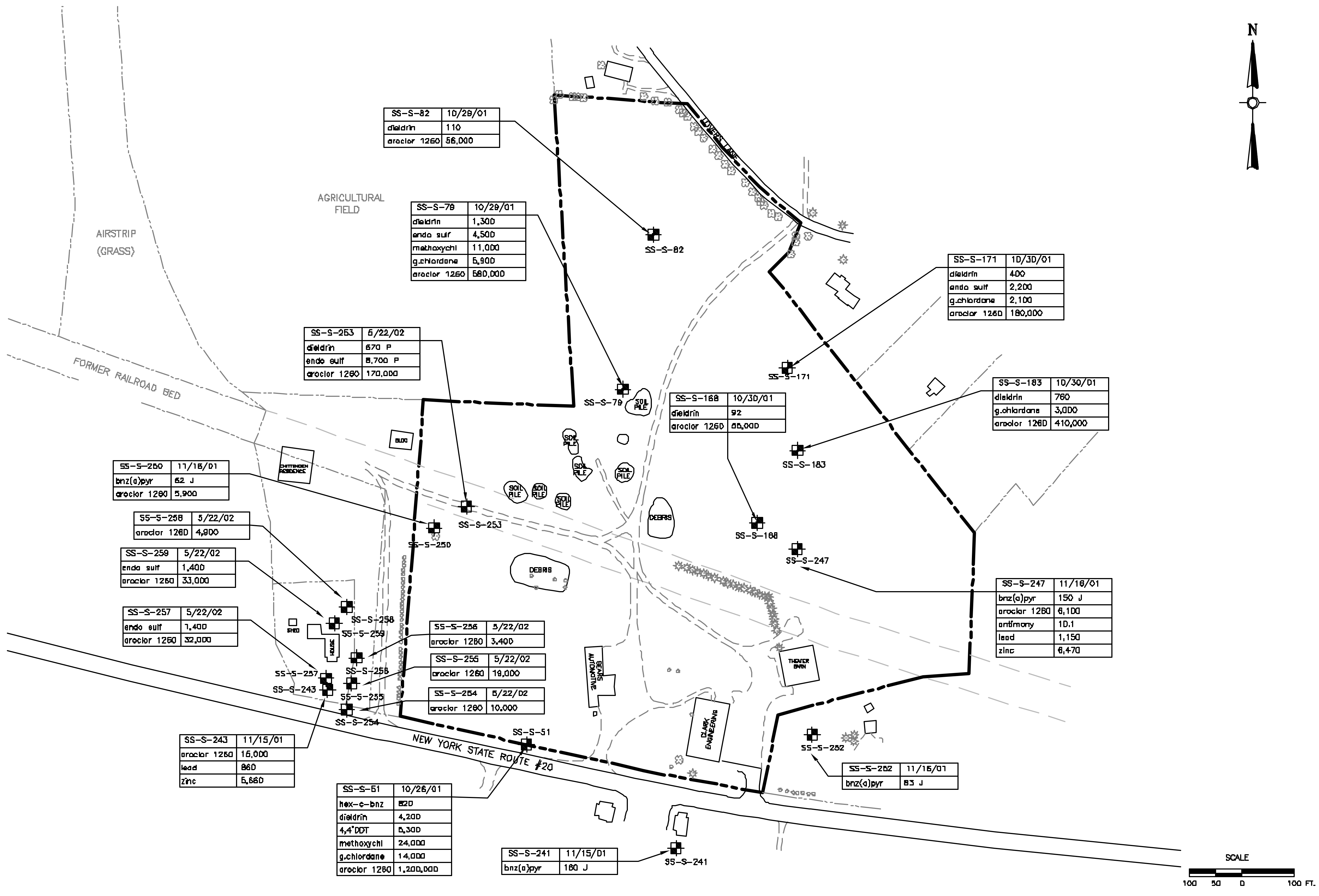


BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

WATER TABLE SURFACE ELEVATION
NOVEMBER 27, 2001

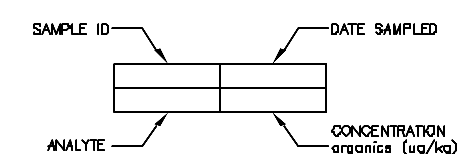
Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3



ABBREV.	ANALYTE	SCG	UNITS
phenol	phenol	30	ug/kg
hex-c-bnz	hexachlorobenzene	410	ug/kg
bnz(a)anth	benzo(a)anthracene	224	ug/kg
chrysene	chrysene	400	ug/kg
bis (2-eth)	bis (2-ethylhexyl) phthalate	50,000	ug/kg
bnz(b)fluor	benzo(b)fluoranthene	1,100	ug/kg
bnz(k)fluor	benzo(k)fluoranthene	1,100	ug/kg
bnz(a)pyr	benzo(a)pyrene	61	ug/kg
dbnzo(a,h)	dibenzo(a,h)anthracene	14	ug/kg
dieldrin	dieldrin	44	ug/kg
endo sulf	endosulfan sulfate	1,000	ug/kg
4,4'DDT	4,4' DDT	2,100	ug/kg
methoxychl	methoxychlor	10,000	ug/kg
g.chlordane	gamma chlordane	540	ug/kg
aroclor 1260	aroclor 1260	*	ug/kg
aluminum	aluminum	SB	mg/kg
antimony	antimony	SB	mg/kg
copper	copper	25/SB	mg/kg
lead	lead	400	mg/kg
manganese	manganese	SB	mg/kg
nickel	nickel	13/SB	mg/kg
selenium	selenium	2/SB	mg/kg
silver	silver	SB	mg/kg
zinc	zinc	20/SB	mg/kg

* - 1,000 surface / 10,000 subsurface
J = estimated concentration



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JUL 12, 2002 SEP

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SCG EXCEEDANCES IN SURFACE SOIL (LABORATORY DATA ONLY)

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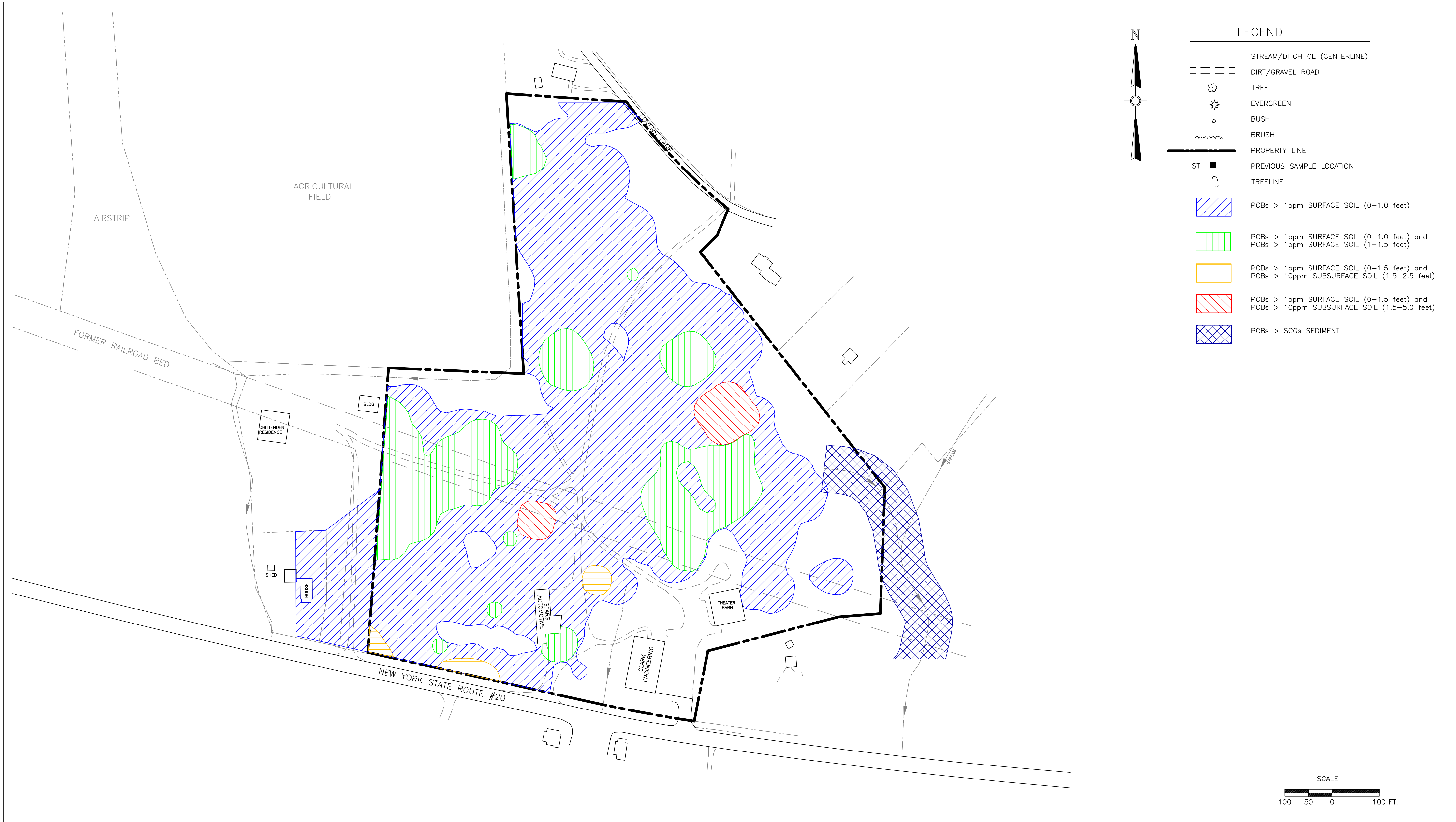
FIGURE 4



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BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

AREAS WITH PCBs EXCEEDING STANDARDS, CRITERIA AND GUIDANCE

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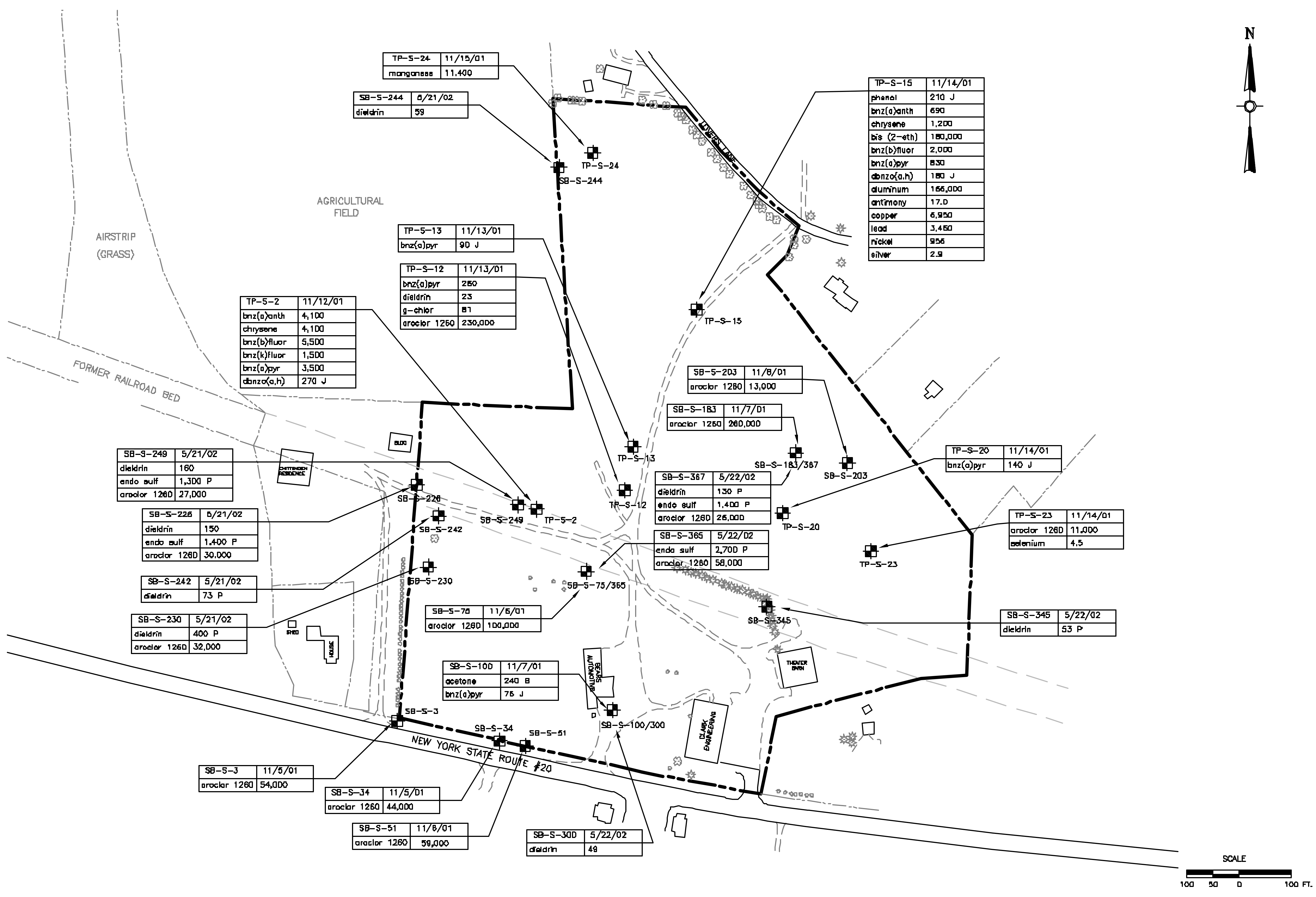
FIGURE 5



ABBREV.	ANALYTE	SCG	UNITS
phenol	phenol	30	ug/kg
hex-c-bnz	hexachlorobenzene	410	ug/kg
bnz(a)anth	benzo(a)anthracene	224	ug/kg
chrysene	chrysene	400	ug/kg
bis (2-eth)	bis (2-ethylhexyl) phthalate	50,000	ug/kg
bnz(b)fluor	benzo(b)fluoranthene	1,100	ug/kg
bnz(k)fluor	benzo(k)fluoranthene	1,100	ug/kg
bnz(a)pyr	benzo(a)pyrene	61	ug/kg
dbnzo(a,h)	dibenzo(a,h)anthracene	14	ug/kg
dieldrin	dieldrin	44	ug/kg
endo sulf	endosulfan sulfate	1,000	ug/kg
4,4'DDT	4,4' DDT	2,100	ug/kg
methoxychl	methoxychlor	10,000	ug/kg
g.chlordane	gamma chlordane	540	ug/kg
aroclor 1260	aroclor 1260	*	ug/kg
aluminum	aluminum	SB	mg/kg
antimony	antimony	SB	mg/kg
copper	copper	25/SB	mg/kg
lead	lead	400	mg/kg
manganese	manganese	SB	mg/kg
nickel	nickel	13/SB	mg/kg
selenium	selenium	2/SB	mg/kg
silver	silver	SB	mg/kg
zinc	zinc	20/SB	mg/kg

* - 1,000 surface / 10,000 subsurface
J = estimated concentration

SAMPLE ID — DATE SAMPLED
ANALYTE — CONCENTRATION organics (ug/kg) inorganics (mg/kg)

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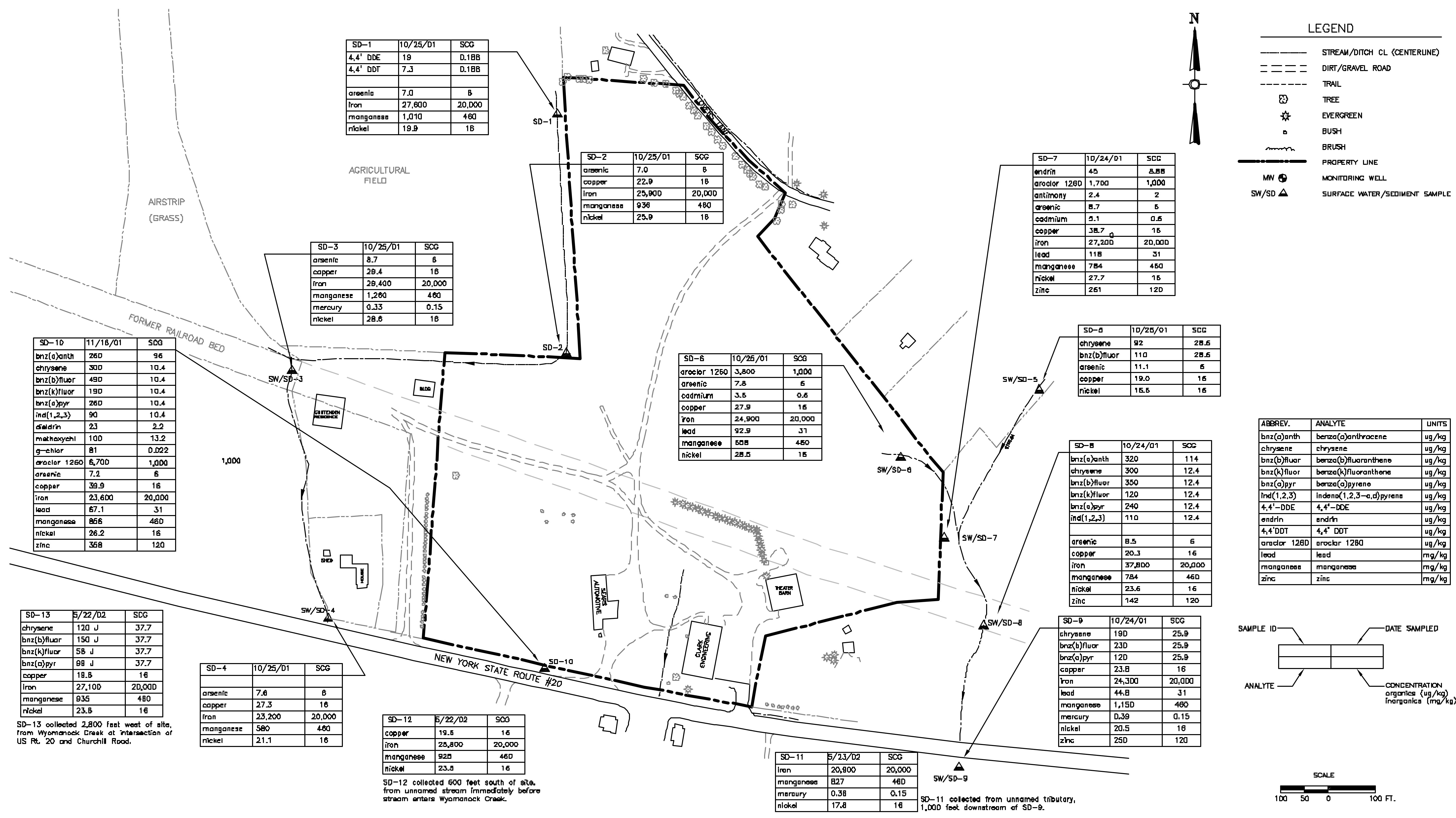
JUL 12, 2002 SEP

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SCG EXCEEDANCES IN SUBSURFACE SOIL (LABORATORY DATA ONLY)

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 6



SD-1	10/25/01	SCG
4,4' DDE	19	0.188
4,4' DDT	7.3	0.188
arsenic	7.0	6
iron	27,600	20,000
manganese	1,010	460
nickel	19.9	16

SD-2	10/25/01	SCG
arsenic	7.0	6
copper	22.9	16
iron	25,900	20,000
manganese	936	460
nickel	25.9	16

SD-3	10/25/01	SCG
arsenic	8.7	6
copper	29.4	16
iron	29,400	20,000
manganese	1,260	460
mercury	0.33	0.15
nickel	28.6	16

SD-10	11/16/01	SCG
bnz(a)anth	260	96
chrysene	300	10.4
bnz(b)fluor	490	10.4
bnz(k)fluor	190	10.4
bnz(a)pyr	260	10.4
ind(1,2,3)	90	10.4
dieldrin	23	2.2
methoxychl	100	13.2
g-chlor	81	0.022
aroclor 1260	6,700	1,000
arsenic	7.2	6
copper	39.9	16
iron	23,600	20,000
lead	67.1	31
manganese	866	460
nickel	26.2	16
zinc	368	120

SD-6	10/25/01	SCG
aroclor 1260	3,800	1,000
arsenic	7.8	6
cadmium	3.6	0.6
copper	27.9	16
iron	24,900	20,000
lead	92.9	31
manganese	668	460
nickel	28.6	16

SD-7	10/24/01	SCG
endrin	45	8.88
aroclor 1260	1,700	1,000
antimony	2.4	2
arsenic	8.7	6
cadmium	5.1	0.6
copper	38.7	16
iron	27,200	20,000
lead	118	31
manganese	784	460
nickel	27.7	16
zinc	261	120

SD-5	10/25/01	SCG
chrysene	92	28.6
bnz(b)fluor	110	28.6
arsenic	11.1	6
copper	19.0	16
nickel	16.6	16

SD-8	10/24/01	SCG
bnz(a)anth	320	114
chrysene	300	12.4
bnz(b)fluor	350	12.4
bnz(k)fluor	120	12.4
bnz(a)pyr	240	12.4
ind(1,2,3)	110	12.4
arsenic	8.5	6
copper	20.3	16
iron	37,800	20,000
manganese	784	460
nickel	23.6	16
zinc	142	120

ABBREV.	ANALYTE	UNITS
bnz(a)anth	benzo(a)anthracene	ug/kg
chrysene	chrysene	ug/kg
bnz(b)fluor	benzo(b)fluoranthene	ug/kg
bnz(k)fluor	benzo(k)fluoranthene	ug/kg
bnz(a)pyr	benzo(a)pyrene	ug/kg
ind(1,2,3)	indeno(1,2,3-c,d)pyrene	ug/kg
4,4'-DDE	4,4'-DDE	ug/kg
endrin	endrin	ug/kg
4,4'DDT	4,4' DDT	ug/kg
aroclor 1260	aroclor 1260	ug/kg
lead	lead	mg/kg
manganese	manganese	mg/kg
zinc	zinc	mg/kg

SD-13	5/22/02	SCG
chrysene	120 J	37.7
bnz(b)fluor	150 J	37.7
bnz(k)fluor	58 J	37.7
bnz(a)pyr	99 J	37.7
copper	18.6	16
iron	27,100	20,000
manganese	935	460
nickel	23.6	16

SD-13 collected 2,800 feet west of site, from Wyomanock Creek at intersection of US Rt. 20 and Churchill Road.

SD-4	10/25/01	SCG
arsenic	7.6	6
copper	27.3	16
iron	23,200	20,000
manganese	580	460
nickel	21.1	16

SD-12	5/22/02	SCG
copper	19.6	16
iron	25,800	20,000
manganese	926	460
nickel	23.6	16

SD-12 collected 600 feet south of site, from unnamed stream immediately before stream enters Wyomanock Creek.

SD-11	5/23/02	SCG
iron	20,900	20,000
manganese	627	460
mercury	0.36	0.15
nickel	17.8	16

SD-11 collected from unnamed tributary, 1,000 feet downstream of SD-9.

SD-9	10/24/01	SCG
chrysene	190	25.9
bnz(b)fluor	230	25.9
bnz(a)pyr	120	25.9
copper	23.8	16
iron	24,300	20,000
lead	44.8	31
manganese	1,150	460
mercury	0.39	0.15
nickel	20.5	16
zinc	250	120

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SCG EXCEEDANCES IN SURFACE WATER SEDIMENT

Dvirka and Bartilucci
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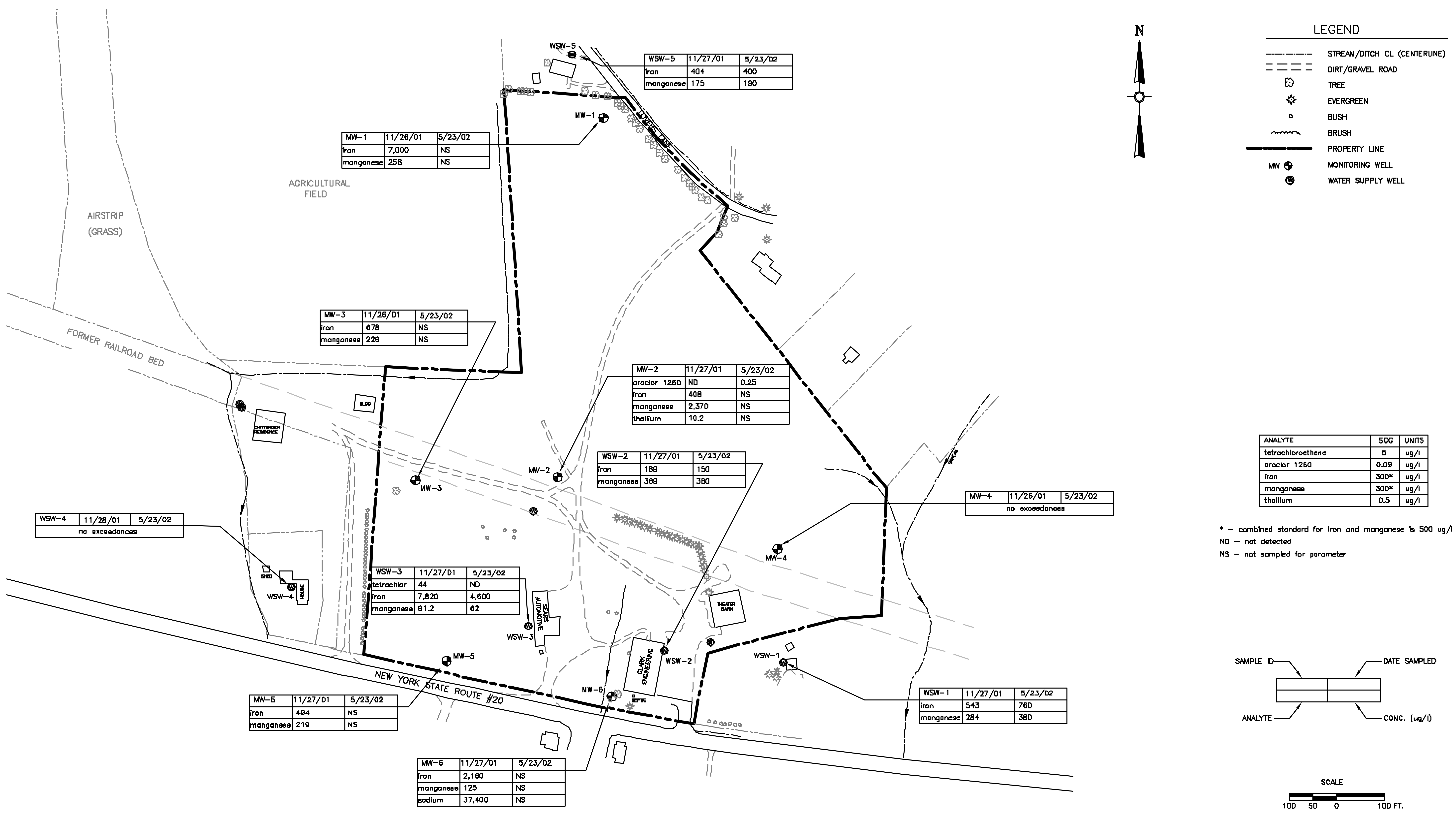
FIGURE 7

MON, JAN 21, 2002 11:00 A SEP C:\1913\bouchardbase.dwg\sedexceed



WSW-5	11/27/01	5/23/02
iron	404	400
manganese	175	190

MW-1	11/26/01	5/23/02
iron	7,000	NS
manganese	258	NS

MW-3	11/26/01	5/23/02
iron	678	NS
manganese	229	NS

MW-2	11/27/01	5/23/02
aroclor 1260	ND	0.25
iron	408	NS
manganese	2,370	NS
thallium	10.2	NS

WSW-2	11/27/01	5/23/02
iron	189	150
manganese	369	380

MW-4	11/26/01	5/23/02
no exceedances		

WSW-4	11/28/01	5/23/02
no exceedances		

WSW-3	11/27/01	5/23/02
tetrachlor	44	ND
iron	7,820	4,600
manganese	81.2	62

MW-5	11/27/01	5/23/02
iron	494	NS
manganese	219	NS

WSW-1	11/27/01	5/23/02
iron	543	760
manganese	284	380

MW-6	11/27/01	5/23/02
iron	2,180	NS
manganese	125	NS
sodium	37,400	NS

ANALYTE	SCG	UNITS
tetrachloroethene	5	ug/l
aroclor 1260	0.09	ug/l
iron	300*	ug/l
manganese	300*	ug/l
thallium	0.5	ug/l

* – combined standard for iron and manganese is 500 ug/l
ND – not detected
NS – not sampled for parameter

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SCG EXCEEDANCES IN GROUNDWATER

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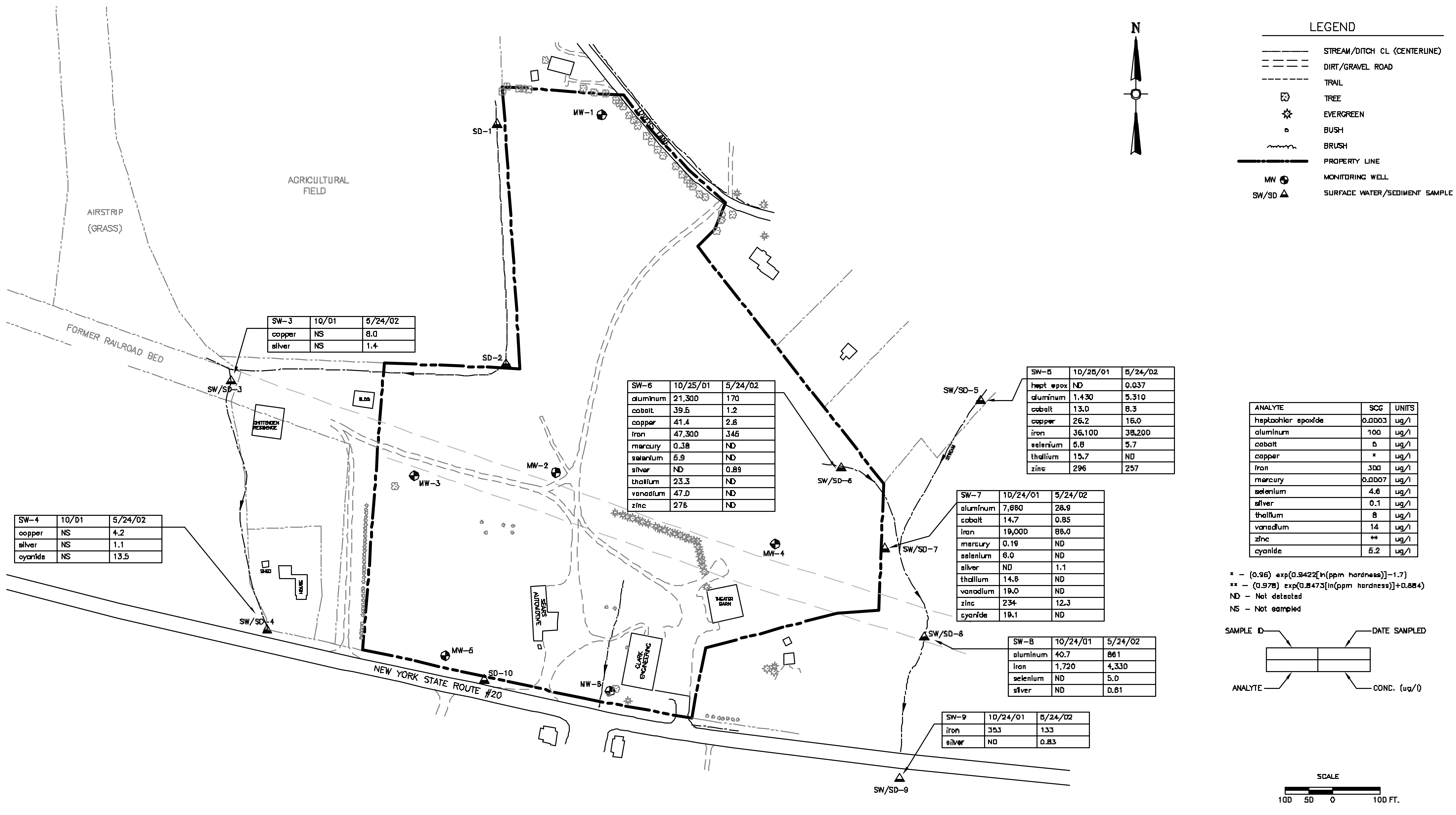
FIGURE 8

MON, JAN 21, 2002 11:00 A SEP C:\1913\bouchardbase.dwg\gwexceed



SW-3	10/01	5/24/02
copper	NS	8.0
silver	NS	1.4

SW-4	10/01	5/24/02
copper	NS	4.2
silver	NS	1.1
cyanide	NS	13.5

SW-6	10/25/01	5/24/02
aluminum	21,300	170
cobalt	39.5	1.2
copper	41.4	2.6
iron	47,300	346
mercury	0.38	ND
selenium	6.9	ND
silver	ND	0.89
thallium	23.3	ND
vanadium	47.0	ND
zinc	276	ND

SW-5	10/25/01	5/24/02
hept epox	ND	0.037
aluminum	1,430	5,310
cobalt	13.0	8.3
copper	26.2	16.0
iron	36,100	38,200
selenium	5.8	5.7
thallium	15.7	ND
zinc	296	257

SW-7	10/24/01	5/24/02
aluminum	7,660	28.9
cobalt	14.7	0.85
iron	19,000	86.0
mercury	0.19	ND
selenium	6.0	ND
silver	ND	1.1
thallium	14.6	ND
vanadium	19.0	ND
zinc	234	12.3
cyanide	19.1	ND

SW-8	10/24/01	5/24/02
aluminum	40.7	861
iron	1,720	4,330
selenium	ND	5.0
silver	ND	0.61

SW-9	10/24/01	5/24/02
iron	353	133
silver	ND	0.83

ANALYTE	SCG	UNITS
heptachlor epoxide	0.0003	ug/l
aluminum	100	ug/l
cobalt	5	ug/l
copper	*	ug/l
iron	300	ug/l
mercury	0.0007	ug/l
selenium	4.6	ug/l
silver	0.1	ug/l
thallium	8	ug/l
vanadium	14	ug/l
zinc	**	ug/l
cyanide	5.2	ug/l

* – (0.96) exp(0.9422[ln(ppm hardness)]−1.7)
** – (0.978) exp(0.8473[ln(ppm hardness)]+0.884)
ND – Not detected
NS – Not sampled

BOUCHARD JUNKYARD SITE
NEW LEBANON, NEW YORK

SCG EXCEEDANCES IN SURFACE WATER

FIGURE 9

Dvirka and Bartilucci
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MON, JAN 21, 2002 11:00 A SEP C:\1913\bouchardbase.dwg\swexceed