Construction Certification Final Report for the Northeastern Gravure Cylinder Service Site Remedial Construction

Town of Moreau
Saratoga County, New York

Prepared for:

New York State Department of Environmental Conservation

Albany, NY

Prepared by:

Camp Dresser & McKee

11 British American Boulevard
Latham, New York

April 2011

Engineer's Construction Certification

Certification

Camp Dresser & McKee's (CDM's) personnel have observed the remedial construction at the Northeastern Gravure Cylinder Service Site according to generally accepted practices. Based on field observations and inspections made by on-site personnel, field and laboratory test data, and data provided by the Contractor, CDM concluded that the remedial construction at the site has been performed in compliance with the July 2007 Record of Decision and the New York State Department of Environmental Conservation (NYSDEC) approved Contract Documents and as stated in this report.

SEAL

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John P. Blaum, P.E.
NYS License # 085079

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Date

Acronyms

bgs	Below Ground Surface
CAMP	Community Air Monitoring Plan
CDM	Camp Dresser & McKee
HASP	Health & Safety Plan
MW	Monitoring Well
M/WBE	Minority/Women-Owned Business Enterprise
NYSDEC	New York State Department of Environmental Conservation
PPE	Personal Protective Equipment
ppm	Parts per Million
PVC	Polyvinyl Chloride
RI	Remedial Investigation
ROD	Record of Decision
TCLP	Toxicity Characteristic Leaching Procedure
UST	Underground Storage Tank
µg/m3	Micrograms per cubic meter

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Section 1 Site Background

1.1 Site Location

The Northeastern Gravure Cylinder Service (NEGC) property (Site) is located at 1439 Saratoga Road (NYS Route 9), in the Town of Moreau, Saratoga County, New York. The site consists of a 1.9 acre property bordered to the northeast by Drywall Center Inc. (the Tierny property), to the west by Rt. 9 Mini Storage and a closed gas station and mini-mart, and to the southeast by the Sun Haven Motel. The Town of Moreau Landfill is located approximately 1500 feet to the north of the NEGC Site, on the north side of Butler Road.

1.2 Site Geology and Hydrogeology

Previous investigations identified unconsolidated deltaic and glaciolacustrine sand deposits, observed reaching a thickness of 130 feet, overlying shale and siltstone bedrock of the Snake Hill Formation. The lacustrine deposits are likely associated with glacial lakes Lake Albany (13,200 years before present), Quaker Springs (13,000 years before present), or Coveville (12,900 years before present). O'Brien and Gere, in the Remedial Investigation (RI) report from June 2007, divided the glaciolacustrine sediments into an upper and lower unit based upon their hydraulic properties. The lower glaciolacustrine sediments observed during the RI were described as "primarily gray, soft, varved silt and clays". The upper glaciolacustrine sediments were described as "primarily gray medium to fine sand with silt and frequent seams of silt, silty clay and clay". Accordingly, the subsurface was divided into three hydrogeologic units including shallow and deep unconsolidated units underlain by a bedrock unit.

The deltaic sand deposits observed during the RI and during the remedial action were described as a mixture of fine-, medium-, and course-grained sands with a trace of silt. Some discontinuous seams and layers of course sand and fine gravel were also observed. During the RI, weathered black shale bedrock of the Snake Hill formation was encountered at 135 feet below ground surface (bgs).

Based on the most recent groundwater measurements taken in January 2005 and May 2006, groundwater flow at the Site in both the shallow and deep unconsolidated hydrogeologic units is predominantly to the north. Depth to groundwater was measured at 35 to 38 feet bgs. Based on these measurements, the horizontal gradient across the site was estimated at 0.010 feet per foot in the shallow unit and 0.020 feet per foot in the deep unit. The average linear velocity of groundwater was estimated at 2.12 to 3.97 feet per day across the Site in the shallow unit and 0.22 to 0.38 feet per day in the deep unit.

1.3 Site History

The Site is a former industrial facility that was used for the plating and engraving of printing cylinders using copper, nickel, trivalent chromium, and hexavalent chromium. Plating and engraving activities began at the facility in 1981 and continued until sometime after 2002, although it is not clear when operations concluded. Frequent water rinsing during the copper and nickel plating process produced trace amounts of metals in the rinsate water. This wastewater was then discharged into two 2,000 gallon concrete underground storage tanks (USTs) located in the southwest corner of the yard behind the building. From these USTs, wastewater was distributed through an underground leaching system of perforated polyvinyl chloride (PVC) pipes that extended across the site.

The New York State Department of Environmental Conservation (NYSDEC) classified the Site as a Class 2 Inactive Hazardous Waste Disposal Site (#546029) in June 2002. This classification is based on the reported overflow spillage of industrial rinsate wastewater to the ground surface from the two on-site USTs, which was first observed in 1985. NYSDEC first listed the Site on the Registry of Inactive Hazardous Waste Disposal Sites in New York and later a consent order was executed in August of 1999. The Environmental Protection Agency (EPA) inspected the facility in June 2002 under the Resource Conservation and Recovery Act (RCRA) program. At that time the facility was still in use, but ceased operations sometime after that.

Several subsurface investigations were conducted at the Site between 1986 and 2007 that revealed the presence of chromium, hexavalent chromium, and copper in the soils, groundwater, and surface water both on- and off-site. These investigations concluded that the main source area was the former spill area and leaching fields near the on-site USTs; however, the leaching field could not actually be located during this investigation. The Record of Decision (ROD) was issued by NYSDEC in July 2007.

In the fall of 2008 CDM and Zebra Environmental performed Geoprobe soil sampling to further delineate impacted soil, supplementing the RI data. Elevated levels of chromium and copper were detected in these soil samples from the surface to depths of up to 20 feet in one location. This supplemental data was used to develop the remedial design documents.

Section 2 Summary of Pre-Construction Activities

2.1 Pre-Construction Activities

Prior to commencing remedial construction and mobilizing on-site, CDM and Precision were required to complete the following pre-construction activities:

- CDM collected and analyzed subsurface soil samples from the Site to delineate subsurface soil contaminated with metals and submit a letter report to NYSDEC summarizing the sample procedures and results;
- CDM prepared and submitted design documents that included an excavation plan and cross-sections, as well as additional remedial construction details;
- CDM prepared and submitted required project plans (work plan, health and safety plan, Minority/Women-Owned Business Enterprise (M/WBE) plan, etc.) for review and approval by NYSDEC prior to mobilization;
- Wilhelm, Chatelle, and Towne Surveyors, P.C. of Canton, NY (WCT), under contract with CDM, surveyed the site and marked out the planned excavation extent;
- CDM took pre-construction photographs;
- CDM collected and analyzed soils for waste classification for the disposal facilities;
- Precision obtained approval of disposal facilities for soils;
- Precision mobilized a construction trailer, temporary bathroom facilities, and temporary construction fencing and constructed the decontamination area, then mobilized personnel and construction equipment and materials; and
- CDM performed a field calibration of the portable X-ray Fluorescence (XRF) meter by collecting surface soil samples at the site, testing them with the XRF meter and submitting them for laboratory analysis of metals. Results showed that the XRF concentrations of chromium and copper were skewed high in most cases compared to the lab results (Table 2.1).

Table 2.1 XRF Calibration Data

Sample ID	Lab Chromium (ppm)	XRF Chromium (ppm)	Lab Copper (ppm)	XRF Copper (ppm)
SSGP-20	141	207	110	529
SSGP-12	105	166.5	389	432.5
SSGP-21	621	1022.5	102	148
SSGP-14	39.3	74	527	397
SSGP-21B	388	822.5	19700	37005.5
SSGP-12B	102	164	341	182.5

2.2 Project Award Information

NYSDEC issued a call-out contract to Precision Environmental Services, Inc. (Precision) of Ballston Spa, NY. Precision performed the excavation activities and coordinated disposal of the excavated materials.

2.3 Project Plan Submittals

In accordance with the contract documents, Precision submitted all project plans to the NYSDEC for review and approval prior to mobilizing on-site. Precision provided documentation of an approved disposal facility for non-hazardous soils that would need to be disposed of.

2.4 Project Schedule

The remedial excavation and site restoration was anticipated to be completed in ten (10) working days. The remedial construction activities began on December 14, 2009 and were completed on January 8, 2010; a total of fifteen (15) days to complete the work.

2.5 Health and Safety Plan

The Health and Safety Plan (HASP) developed by Precision contains information on Hazard Assessment, Site Control, Work, Clothing and Levels of Personnel Protection, Monitoring Procedures and Program, Training, Medical Surveillance, and Communications. There also are sections within the HASP on Decontamination Procedures, Disposal Procedures, Community Protection Plan, Emergency Plan, Record Keeping, Air Monitoring, and Authorizations.

2.5.1 Air Monitoring

CDM developed a Community Air Monitoring Plan (CAMP) including continuous real-time monitoring of dust during all intrusive activities using a dust meter. The action levels given in the CAMP were 0.20 milligrams (mg) per cubic meter (m^3) at the work area perimeter and 100 micrograms (µg) per m^3 at the site perimeter. However, very low dust levels were detected throughout the length of the project and there were no exceedances of the dust limits.

Section 3 Summary of Remedial Construction Activities

The scope of work for the remedial construction included clearing trees to prepare for the excavation, removing and disposing of all USTs on-site, excavating impacted soils, backfilling excavation with clean fill, disposing of drums of soil cuttings and purge water left on-site from the RI, and final survey of the excavation extent and post-excavation site topography.

The remedial construction was performed in accordance with the remedial construction documents. CDM maintained a resident inspector on-site during all remedial construction activities. Daily reports were prepared by the CDM inspector to document the construction activities including daily photo documentation. These reports were submitted to NYSDEC for review. The Precision site superintendent also maintained field notes. Visitors were noted on the CDM inspector's daily reports. A copy of the CDM daily reports is provided in Appendix A. All changes to the contract documents not discussed in this section are discussed in Section 5.

Included in this section is a discussion of the construction means and methods. Any changes to the remedial construction documents were approved by the NYSDEC project manager in the field.

3.1 Excavation of On-Site Impacted Soils

The excavation plan was developed based on soil sampling performed during the RI in 2007 and supplemental sampling by CDM in 2008. Appendix B contains a drawing of the planned excavation depth and extent. The goal of the remedial construction was to remove metals contaminated soils from the area behind the existing building. The ROD set clean-up goals of 36 parts per million (ppm) for chromium (total chromium), 270 ppm for copper, and 22 ppm for hexavalent chromium. A total of 1,426 tons of contaminated soil was removed from the site between December 17, 2009 and January 8, 2010. The drawing in Appendix C shows the final depth and limit of excavation.

During the remedial construction, soils were continuously screened in the field for metals concentrations using a portable XRF meter. The XRF calibration (Section 2.1) indicated that the screening of soils would most likely yield chromium and copper concentrations well above the subsequent laboratory results. Using this data as guidance, forty (40) confirmatory soil samples were collected and analyzed for TAL metals plus hexavalent chromium by Adirondack Laboratories. Following sample collection, the excavation was continuously backfilled due to safety and access concerns. The confirmation sample locations are marked on the drawing in Appendix C.

At the request of NYSDEC, CDM screened surface soils approximately ten (10) feet to the north, east, and west of the excavation area. The field screening confirmed additional excavation was not warranted. The completed excavation drawing, included in Appendix C, shows the final extent of the remedial excavation.

3.2 UST and Leaching Field Pipe Removal

Background documentation on the Site made mention of USTs and a leaching field connected to the USTs behind the building. Upon initial inspection, two concrete USTs were found with vault access at the surface. Over the course of the remedial excavation, a third UST was uncovered to the east of the two known tanks. All three of the USTs were similar to a typical concrete septic tank and were connected to perforated PVC pipes that ran out into the yard.

The first UST uncovered was buried approximately six feet below ground surface (bgs) and had a capacity of approximately 1,000 gallons. It was filled with gravel and had PVC lines running out to the east and west. The other two USTs, located on the south side of the Site were also removed. Each tank had a capacity of approximately 2,000 gallons and had solid PVC lines connected to them from the building. Once the tanks were removed, soil was excavated from the sides and bottom to form an area approximately 20 feet wide and 30 feet long by 16-20 feet deep.

The PVC lines were removed along with impacted gravel and soil surrounding the piping. Excavation work stopped when end point screening samples indicated chromium and copper levels below the ROD-specific clean-up goals.

3.3 Drum and Soil Removal

Nineteen (19) 55-gallon steel drums were left on-site from various RI activities. Three (3) of the drums were labeled purge water, but were empty and 16 drums were full of soil cuttings. Precision emptied the drums and disposed of the soil and drums separately at the landfill.

During remedial construction, excavated soil was stockpiled on one side of the site and loaded into the dump truck for disposal. The area under the stockpile was excavated last and the soil was loaded directly into trucks.

Contaminated soil was transported by West Central Trucking to the Town of Colonie Landfill and was designated non-hazardous. Overall, 1,426 tons of soil was disposed of from the Site. Waste manifests for soil disposal are included as Appendix D.

3.4 Backfilling

Certified clean backfill was transported to the site by Wm. M. Larned and Sons, Inc. of Schenectady, NY. Truck loads of sand fill were delivered, in loads of approximately 20 yards each, to fill in the excavation. A total of 66 loads, or approximately 1,320 yards, of clean fill were delivered to the Site and used to fill in the excavation in lifts. Backfill was placed in lifts not exceeding two (2) feet and compacted using the excavator bucket.

3.5 Final Site Restoration and As-Built Survey

Once the excavation was backfilled, it was graded and a final as-built survey was completed by WCT. The final as-built survey is included as Appendix E.

3.6 Additional Site Work

On August 10, 2010, Precision and CDM returned to the Site to perform additional excavation activities at the request of NYSDEC. This additional excavation was in response to chromium and/or copper exceedances detected in samples SS-36, SS-38, CS-1, and CS-2. As shown in Appendix C, an eight-foot-square by one-foot deep area was excavated around sample locations SS-36, SS-38, and CS-1, and an eight-foot by twelve-foot area was excavated around CS-2. Sidewall and bottom confirmation samples were collected by CDM personnel from each location. Approximately 25 tons of additional material was excavated for disposal.

The confirmation samples were analyzed for chromium, hexavalent chromium, and copper. All but one of the confirmation samples collected in August 2010 exhibited concentrations below the ROD-specific clean-up goals. Sample CS-2B-BOTTOM had a chromium concentration of 114 mg/kg and a copper concentration of 940 mg/kg, exceeding the clean-up goals of 36 mg/kg and 270 mg/kg, respectively.

On October 11, 2010, Precision returned to the Site to remove the remaining impacted soil in the vicinity of sample CS-2. After excavating 19.34 tons of soil and reaching a depth of four (4) feet, bottom sample CS-2C was collected by Precision and submitted for analysis. A copper concentration of 1.97 mg/kg and chromium concentration of 3.92 mg/kg were detected, both results were below the ROD-specific clean-up goals. On December 23, 2010, the soil was removed from the site and the excavation was backfilled and graded. The analytical results are presented in Appendix F.

All excavated material was transported from the Site by MCES Environmental of Queensbury, NY. and disposed of at the Town of Colonie Landfill as non-hazardous waste.

Section 4 Sampling and Analysis

NYSDEC contracted with Adirondack Environmental Services of Albany, NY to perform analysis of soil samples collected during the remedial action. A table of laboratory data is included in Appendix F and a complete set of analytical data is provided on CD in Appendix G. All samples were collected, stored, transported, and analyzed according to CDM's Generic Quality Assurance Project Plan (QAPP) for NYSDEC Standby Contract.

4.1 Remedial Excavation Confirmation Sampling

The area behind the building was excavated to a depth of between one (1) foot and twenty (20) feet. As described in Section 3.2 of this report, soil samples from the limits of the excavation were field screened using a portable XRF meter. Composite confirmation samples were also collected from the sidewalls and bottom of the excavation approximately every 15 feet and submitted for laboratory analysis.

Three (3) surface soil samples (SS-31, SS-36, and SS-38) were also collected from approximately ten (10) feet beyond the extent of the excavation. A total of 40 confirmation soil samples were collected in and near the excavation in December 2009 and January 2010 and were analyzed for TAL Metals plus hexavalent chromium. An additional seven (7) confirmation samples were collected in August 2010 and one (1) in October 2010 during the supplementary excavations. These additional samples were analyzed for total chromium, hexavalent chromium, and copper. The sample locations are indicated on the sample location drawing included as Appendix C.

All of the confirmation samples collected in December 2009 and January 2010 were screened using the XRF and selected for analysis using the calibration results as guidance. However, due to the heterogeneity of the soil samples and some variability in the field XRF readings, the lab analysis results for twelve (12) of these samples indicated concentrations slightly above the clean-up goals. Exceedances of chromium ranged from 38.2 ppm in sample CS-50 at a depth of nine (9) feet to 116 ppm in surface sample SS-38. Exceedances of copper ranged from 435 mg/kg in sample CS-1 at a depth of one (1) foot to 315 ppm in sample CS-93 at a depth of four (4) feet. The XRF meter could not detect hexavalent chromium, only total chromium; however, the lab reported no hexavalent chromium detections in any confirmation samples.

Soils in the area of sample locations CS-82, CS-83, CS-93, were left in place due to the structural integrity of the excavation sidewalls. Sample CS-82 had a chromium concentration of 99.1 ppm and a copper concentration of 4.64 ppm. Sample location CS-93 excavation was not advanced due to the close proximity to the building. Soils in the area of sample locations CS-43, CS-73, and CS-74 were left in place after field screening with the XRF meter indicated they were non-detect for copper and chromium. However, subsequent lab results showed chromium concentrations between 57.7 and 83.2 ppm. For sample CS-98, contrary to the field screening results, the laboratory chrome concentration of 68.3 ppm was not less than the 65 ppm indicated by the XRF.

Six (6) of the seven (7) confirmation samples collected during the supplemental excavation in August 2010 showed chromium and copper concentrations below the ROD-specific clean-up goals. Sample CS-2B-BOTTOM, collected at the south corner of the Site at a depth of two (2) feet showed a chromium concentration of 114 ppm and a copper concentration of 940 ppm. Following additional excavation in this area in October 2010, analysis of sample CS-2C indicated concentrations of chromium and copper of 3.92 ppm and 1.97 ppm respectively, well below the cleanup goals.

Previous subsurface soil sampling completed during the RI and the 2008 supplemental investigation did not indicate exceedances at depths greater than twenty (20) feet and did not show exceedances deeper than four (4) feet outside the UST and sample CS-46 areas. In addition, a soil sample from the CS-82 location was also analyzed by toxic characteristic leaching procedure (TCLP) method, yielding a chromium concentration of 0.2 ppm. Therefore, the residual contamination left in place is estimated to be minimal and will not be a continuing source of groundwater contamination.

Table 4.1 contains a summary of laboratory data and field screening readings for all of the confirmation samples collected in December 2009 and January 2010 and compares the concentrations with the ROD-specific clean-up goals. Appendix F includes a laboratory data summary table and TCLP data from samples collected below the USTs.

4.2 Data Validation

Laboratory reports were submitted to Conestoga-Rovers and Associates (CRA) of Niagara Falls, NY for data validation. The data validation report concluded that the data was acceptable, with some noted qualifications. The data validation report is included as Appendix H.

Table 4.1 - Analytical Data

Sample ID	Depth (feet below ground surface)	Lab Total Chromium (ppm)	XRF Total Chromium (ppm)	Lab Hexavalent Chromium (ppm)	Lab Copper (ppm)	XRF Copper (ppm)
ROD-Specific Clean-Up Goals		**36**	**36**	**22**	**270**	**270**
SS-31	0	25.8	76.5	ND < 0.4	55	71.5
SS-36	0	42.5	81.3	ND < 0.4	48.1	59.7
SS-38	0	116	149	ND < 0.4	69.3	82
CS-1	1	58.4	101.5	ND	435	463
CS-2	1	66.8	80	ND	265	169.5
CS-4	1	3.33	44	ND	19	22.5
CS-9	1	2.92	ND	ND	2.08	ND
CS-10	1	13.2	70	ND	20.3	24
CS-11	1	2.87	ND	ND	1	ND
CS-14	1	3.41	ND	ND	2.79	ND
CS-15	1	3.41	ND	ND	3.52	ND
CS-27	4	5.92	10.5	ND	16	10.5
CS-32	4	28.8	68	ND	86.3	119
CS-39	4	15.2	50	ND	37.8	112
CS-41	8	4.44	ND	ND	15.3	21.5
CS-43	8	57.7	ND	ND	8.28	ND
CS-46	4	17.5	61.5	ND	78.1	97
CS-49	1	10.1	80	ND	52.7	55.5
CS-50	9	38.2	90	ND	13.8	17
CS-51	9	30.2	84.5	ND	7.19	16
CS-54	9	15.7	59.5	ND	24.8	14
CS-55	4	3.06	51.5	ND	16.6	45.5
CS-56	2	1.58	ND	ND	1.08	ND
CS-59	2	1.55	ND	ND	0.94	ND
CS-64	4	4.86	ND	ND	2.94	ND
CS-71	8	6.91	ND	ND	20.9	ND
CS-73	8	70.4	ND	ND	12.1	ND
CS-74	16	83.2	ND	ND	11.5	ND
CS-76	8	1.33	119	ND	10.4	12
CS-80	8	1.46	ND	ND	0.887	ND
CS-82	20	99.1	ND	ND	4.64	ND
CS-83	10	91.5	6	ND	8.39	6
CS-84	4	8.42	119	ND	27.5	25
CS-91	4	15	49	ND	192	85
CS-93	4	44.6	55	ND	315	74
CS-94	4	3.36	ND	ND	46.4	ND
CS-98	4	68.3	65	ND	45.7	16
CS-99	1	2.76	ND	ND	2.74	ND
CS-103	1	26.8	96.5	ND	48.2	80.5
CS-105	1	5.76	40.5	ND	45.8	121

LEGEND Indicates Concentration above the ROD-Specific Clean-Up Goals

ppm parts per million

XRF X-ray flourescence portable meter

Section 5 Changes to the Contract and Project Issues

During the course of the remedial excavation, a third UST was located on-site and leaching field lines were also found throughout the area behind the NEGC building. The third tank and the lines were removed and disposed of along with the impacted soil surrounding them. Removal of these lines and the additional UST were not included in the work plan or the estimated tonnage for removal, disposal and backfill. Removing the lines and additional UST increased the amount of excavated material from an estimated 905 tons to a total of 1,426 tons. The number of days working onsite increased from an estimated 10 days to 15 days. Following the receipt of confirmation sample results, two more days were spent in the field excavating an additional 45 tons of soil on August 10, 2010 and October 11, 2010. The final total of excavated material was 1,471 tons.

Section 6 Conclusions

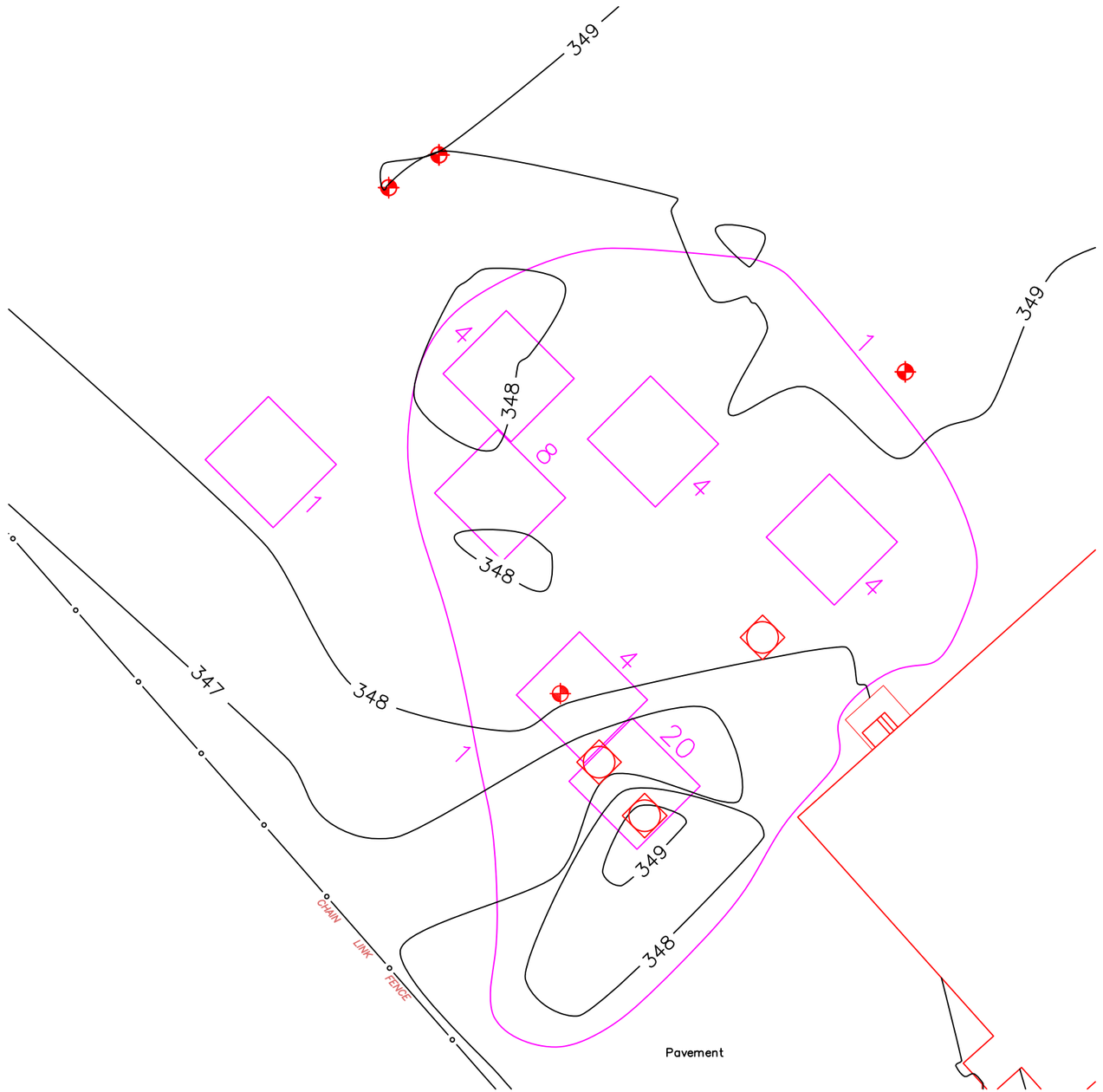
Based on field observations and inspections made by CDM's on-site personnel, as well as field and laboratory test data, CDM concludes that the remedial construction at the Site has been performed in compliance with the July 2007 Record of Decision, the contract related documents, and as stated in this report.

During the remedial construction, additional remediation work was conducted that included the removal of additional contaminated soils around leaching field pipes and a third UST. All contaminated soils were removed to the extent practical, but residual chromium and copper contamination above ROD-specific clean-up goals remain in the subsurface soils. Based on all of the subsurface sampling completed to date, the depth and concentration of the small amount of residual contamination that remains presents a very low risk for future impacts. In addition, the results of the remediation work clearly demonstrate that the source of the onsite and offsite groundwater contamination has been removed.

As stated in the ROD, onsite and offsite groundwater monitoring will be implemented as part of the Site Management Plan.

Appendix A
CDM Daily Reports

Appendix B
Proposed Excavation Plan Drawing



LEGEND

- 349 — CONTOUR WITH ELEVATION
- MONITORING WELL
- PLANNED EXCAVATION LIMIT
- UNDERGROUND STORAGE TANK

PLAN
1"=10'

1" = 10'
5 0 10

WARNING
IT IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR TO ALTER IN ANY WAY PLANS, SPECIFICATIONS, PLATES OR REPORTS TO WHICH THE SEAL OF A PROFESSIONAL ENGINEER OR LAND SURVEYOR HAS BEEN ATTACHED.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: H HALLETT
DRAWN BY: R HAINES
SHEET CHK'D BY: H HALLETT
CROSS CHK'D BY: J BLAUM
APPROVED BY:
DATE: FEBRUARY 2010

CDM
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NYSDEC
NEGC-SITE NO. 5-46-029
MOREAU, SARATOGA COUNTY, NEW YORK

CONSTRUCTION CERTIFICATION REPORT
PROPOSED EXCAVATION PLAN DRAWING

PROJECT NO. 0897-73783
FILE NAME: APPENDIX B
SHEET NO.
APPENDIX B

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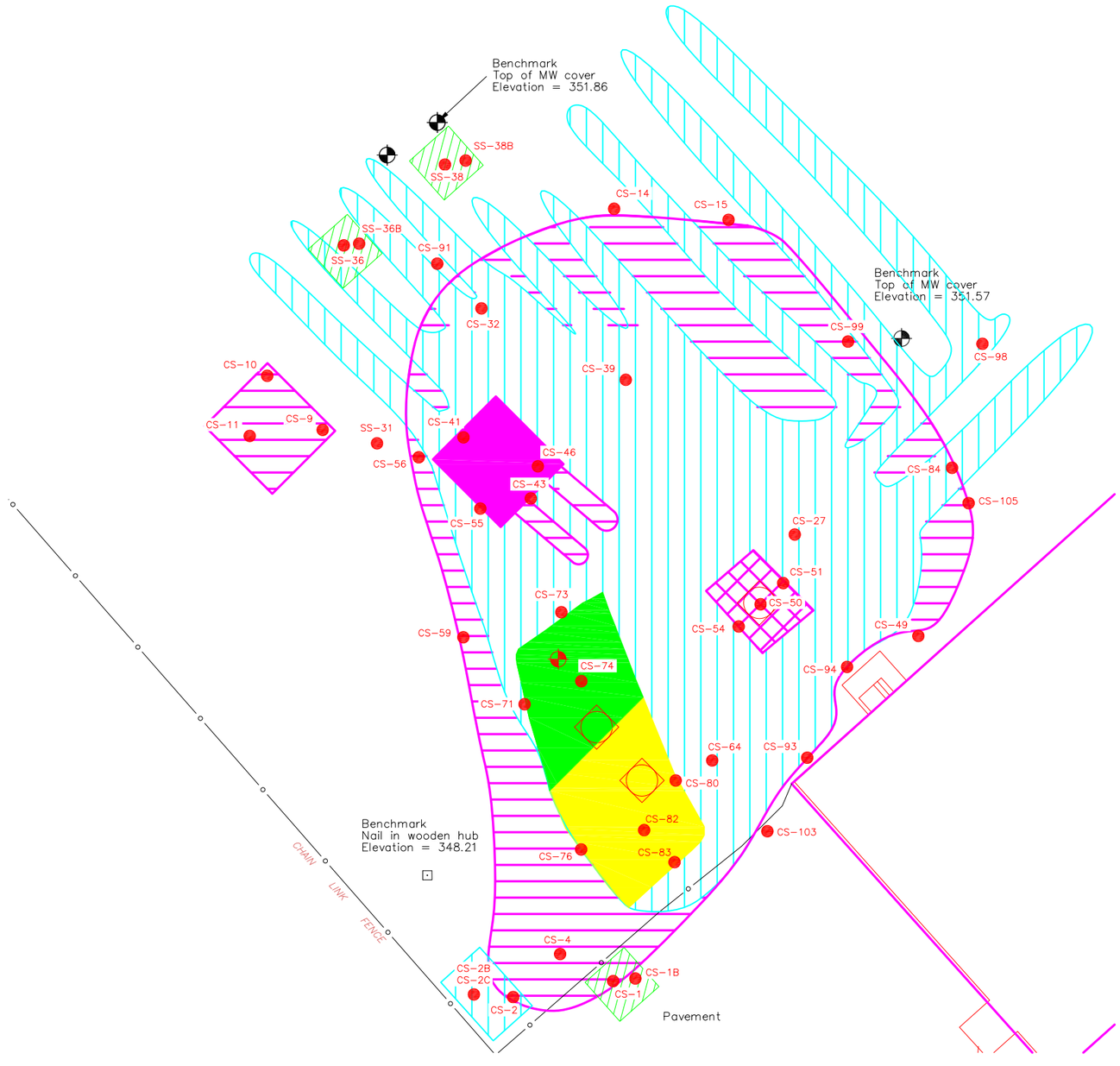
Appendix C
Completed Depth and Limit of Excavation Drawing



PLAN
1"=10'

1" = 10'
5 0 10

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LEGEND

- 1 FT DEEP EXCAVATED AREA
- 1 FT DEEP EXCAVATED AREA, AUGUST 2010
- 4 FT DEEP EXCAVATED AREA
- 8 FT DEEP EXCAVATED AREA
- 9 FT DEEP EXCAVATED AREA
- 16 FT DEEP EXCAVATED AREA
- 20 FT DEEP EXCAVATED AREA
- CS-32 CONFIRMATION SAMPLE LOCATION
- MONITORING WELL
- REMOVED MONITORING WELL
- CHAIN LINK FENCE
- UNDERGROUND STORAGE TANK
- SS-32 CONFIRMATION SURFACE SAMPLE LOCATION

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consulting • engineering • construction • operations

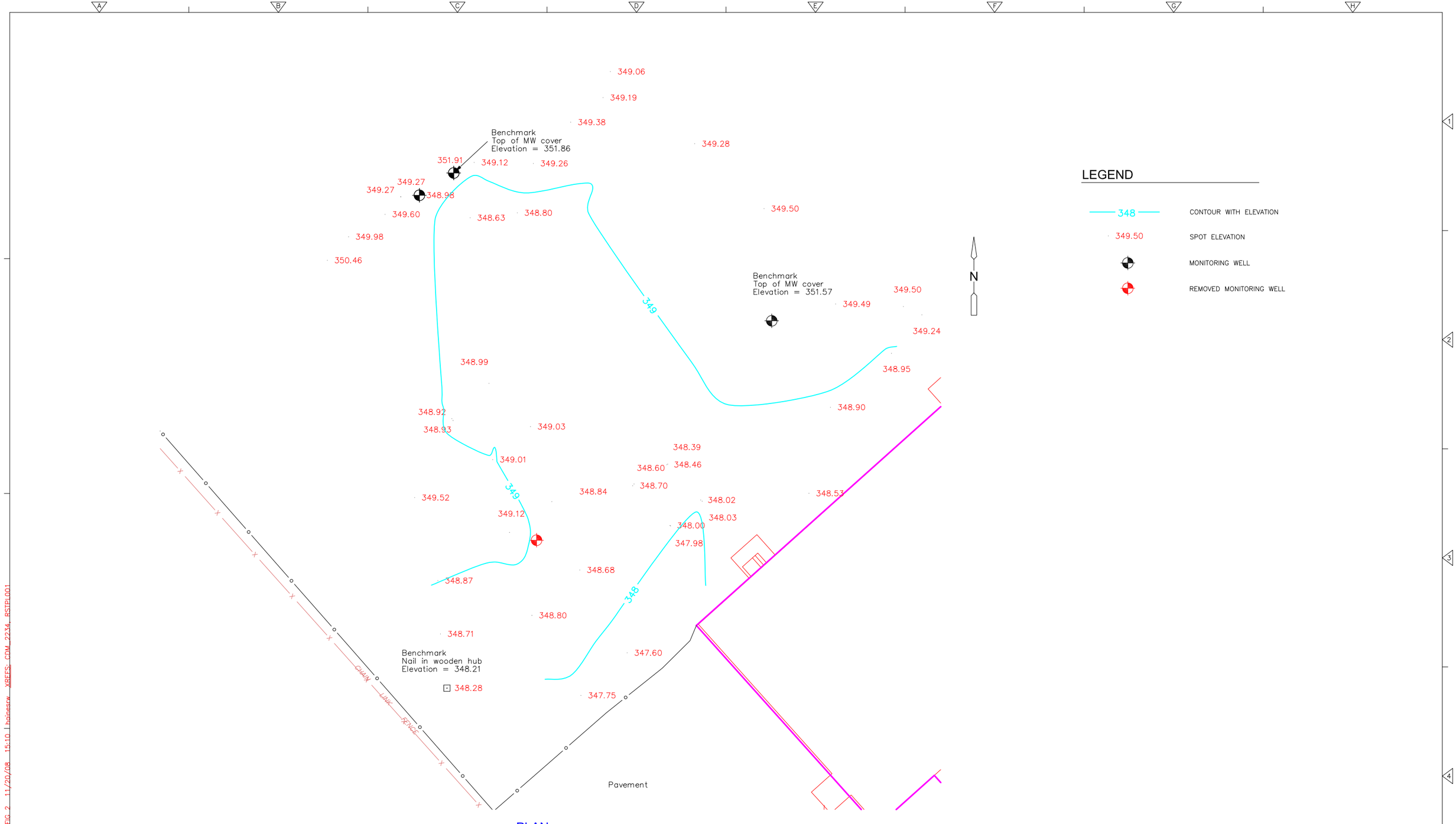
NYSDEC
NEGC-SITE NO. 5-46-029
MOREAU, SARATOGA COUNTY, NEW YORK

CONSTRUCTION CERTIFICATION REPORT
COMPLETED DEPTH AND LIMIT OF EXCAVATION

PROJECT NO. 0897-73783
FILE NAME: APPENDIX C
SHEET NO.
APPENDIX C

Appendix D
Waste Manifests and Bills of Lading

Appendix E
Finished Grading Survey Drawing



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NYSDEC
NEGC-SITE NO. 5-46-029
MOREAU, SARATOGA COUNTY, NEW YORK

CONSTRUCTION CERTIFICATION REPORT
FINISHED GRADING SURVEY DRAWING

PROJECT NO. 0897-73783
FILE NAME: APPENDIX G
SHEET NO.
APPENDIX E

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Appendix F
Analytical Data Table

Appendix F
Analytical Data
NYSDEC Work Assignment # D006131
Northeast Gravure Site Number 5-46-029

Sample ID Lab Sample Number Sampling Date Matrix Units	ROD-Specific Clean-Up Goals (ppm)	SS-31 091215002-001A 12/14/2009 Soil mg/kg			SS-36 091215002-002A 12/14/2009 Soil mg/kg			SS-38 091215002-003A 12/14/2009 Soil mg/kg			CS-1 091218061-008A 12/15/2009 Soil mg/kg			CS-2 091218061-010A 12/15/2009 Soil mg/kg			CS-4 091218061-009A 12/15/2009 Soil mg/kg			CS-9 091218061-003A 12/16/2009 Soil mg/kg			CS-10 091218061-004A 12/15/2009 Soil mg/kg			CS-11 091218061-006A 12/15/2009 Soil mg/kg		
Compound			Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF
Aluminum	**NS**	6120		1	6000		1	6360		1	10200			8250			9150			11600			8470			9580		
Antimony	**NS**	ND < 3	S	1	ND < 3	S	1	ND < 3	S	1	ND			ND			ND			ND			ND			ND		
Arsenic	**NS**	ND < 0.25		1	ND < 0.25		1	ND < 0.25		1	ND			ND			ND			ND			ND			ND		
Barium	**NS**	13.8		1	14.6		1	13.9		1	8.76			20.4			12.8			15.4			18.9			14.5		
Beryllium	**NS**	ND < 0.25		1	ND < 0.25		1	ND < 0.25		1	0.0023	J		0.04	J		0.044	J		0.089	J		0.067	J		0.028	J	
Cadmium	**NS**	ND < 0.25		1	ND < 0.25		1	ND < 0.25		1	0.048	J		0.094	J		0.02	J		0.011	J		0.078	J		ND		
Calcium	**NS**	1280		1	1270		1	1080		1	658			1560			594			701			1540			618		
Chromium	**36**	25.8		1	42.5		1	116		1	58.4			66.8			3.33			2.92			13.2			2.87		
Chromium, Hexavalent	**22**	ND < 0.4		1	ND < 0.4		1	ND < 0.4		1	ND			ND			ND			ND			ND			ND		
Cobalt	**NS**	ND < 2.5		1	ND < 2.5		1	ND < 2.5		1	2.5	J		2	J		2.6	J		2.7	J		3	J		2.7	J	
Copper	**270**	55		1	48.1		1	69.3		1	435			265			19			2.08			20.3			1	J	
Iron	**NS**	6770		10	5660		10	6010		10	7030			6280			7050			7800			8360			7860		
Lead	**NS**	14.8		1	8.36		1	8.42		1	3.59			11.8			ND			ND			7.76			ND		
Magnesium	**NS**	1200		1	1300		1	1120		1	1090			1020			1160			1340			1540			1410		
Manganese	**NS**	98.7		1	90.1		1	93.4		1	45.5			120			52.6			61.1			157			66.1		
Mercury	**NS**	ND < 0.02		1	ND < 0.02		1	ND < 0.02		1	ND			ND			ND			ND			ND			ND		
Nickel	**NS**	4.3		1	3.47		1	3.74		1	6.1	J		2.9	J		3.1	J		3	J		3.6	J		2.5	J	
Potassium	**NS**	136		1	229		1	157		1	123	J		110	J		122	J		134	J		133	J		153	J	
Selenium	**NS**	ND < 0.25	S	1	ND < 0.25	S	1	ND < 0.25	S	1	ND			ND			ND			ND			ND			ND		
Silver	**NS**	ND < 1	S	1	ND < 1	S	1	ND < 1	S	1	ND	J		5.16	J		ND	J		ND	J		ND	J		ND	J	
Sodium	**NS**	171		1	154		1	169		1	91	J		62	J		66	J		88	J		83	J		68	J	
Thallium	**NS**	ND < 0.5	S	1	ND < 0.5	S	1	ND < 0.5	S	1	ND	J		ND	J		ND	J		ND	J		ND	J		ND	J	
Vanadium	**NS**	8.68	S	1	9.32	S	1	9.15	S	1	7.1	J		3.7	J		5.5	J		4.5	J		4.8	J		6.9	J	
Zinc	**NS**	33.5		1	27.6		1	25.8		1	34	J		22.2	J		20.3	J		19.1	J		23.6	J		17.1	J	

LEGEND

	Indicates Concentration above the ROD-Specific Clean-Up Goals
DF	Dilution Factor
Q	Quality Notes
J	Estimated Value
S	Spike Recovery outside accepted recovery limits
ND	Non Detect above the method detection limit
NS	No Standard
mg/kg	milligrams per kilogram
ppm	parts per million
NA	Not analyzed

Sample ID Lab Sample Number Sampling Date Matrix Units	ROD-Specific Clean-Up Goals (ppm)	CS-14 091218061-001A 12/16/2009 Soil mg/kg			CS-15 091218061-007A 12/16/2009 Soil mg/kg			CS-27 091218061-002A 12/16/2009 Soil mg/kg			CS-32 091218061-005A 12/17/2009 Soil mg/kg			CS-39 091218061-011A 12/18/2009 Soil mg/kg			CS-41 091218061-012A 12/19/2009 Soil mg/kg			CS-43 091218061-013A 12/19/2009 Soil mg/kg			DUP-1 091218061-014A 12/18/2009 Soil mg/kg			DUP-2 091218061-015A 12/18/2009 Soil mg/kg		
Compound			Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF
Aluminum	**NS**	9470			6630			4450			4710			3630			2980			3820			4460			5620		
Antimony	**NS**	1.8	J		ND			ND			ND			ND			ND			ND			ND			ND		
Arsenic	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Barium	**NS**	18.5			17.2			7.96			7.1			8.5			7.41			4.99			6.89			7.84		
Beryllium	**NS**	0.015	J		ND			0.09	J		0.032	J		0.046	J		0.019	J		0.025	J		0.093	J		0.13	J	
Cadmium	**NS**	0.022	J		0.19	J		0.011	J		0.027	J		0.031	J		0.0084	J		0.015	J		0.0063	J		0.013	J	
Calcium	**NS**	457			1140			777			796			757			1090			432			747			1170		
Chromium	**36**	3.41			3.41			5.92			28.8			15.2			4.44			57.7			18.4			69.5		
Chromium, Hexavalent	**22**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Cobalt	**NS**	2.9	J		2	J		2.1	J		2	J		1.8	J		1.8	J		1.5	J		1.8	J		2.6	J	
Copper	**270**	2.79			3.52			16			86.3			37.8	J		15.3			8.28			119	J		12.1		
Iron	**NS**	6740			6100			6510			6190			5300			5300			4730			5650			8000		
Lead	**NS**	ND			11.1			0.68	J		0.46	J		0.54	J		0.51	J		1.99			0.82	J		1.85		
Magnesium	**NS**	1090			941			1350			1370			1040			1250			1160			1150			2040		
Manganese	**NS**	67.5			135			53.8			61.2			59.3			58.8			41.9			57.3			82.4		
Mercury	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Nickel	**NS**	2.4	J		2.7	J		2	J		1.8	J		2.1	J		1.6	J		1.8	J		2.6	J		4	J	
Potassium	**NS**	161	J		110	J		155	J		144	J		120J			113	J		144	J		106	J		175	J	
Selenium	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Silver	**NS**	ND	J		ND	J		1.9	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J	
Sodium	**NS**	95	J		57	J		93	J		84	J		71	J		79	J		57	J		77	J		98	J	
Thallium	**NS**	ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J	
Vanadium	**NS**	5	J		1.4	J		4.7	J		5.1	J		3.5	J		4.4	J		3.7	J		4.7	J		3.8	J	
Zinc	**NS**	16.8	J		24.9	J		14.6	J		29.3	J		21.2	J		18.6	J		11.2	J		42.4	J		20.7	J	

LEGEND

	Indicates Concentration above the ROD-Specific C
DF	Dilution Factor
Q	Quality Notes
J	Estimated Value
S	Spike Recovery outside accepted recovery limits
ND	Non Detect above the method detection limit
NS	No Standard
mg/kg	milligrams per kilogram
ppm	parts per million
NA	Not analyzed

Sample ID		CS-46			CS-49			CS-50			CS-51			CS-54			CS-55			CS-56			CS-59			DUP-3		
Lab Sample Number	ROD-Specific	091223003-007A			091223003-008A			091223003-004A			091223003-003A			091223003-005A			091223003-006A			091223003-002A			091223003-001A			091223003-009A		
Sampling Date	Clean-Up Goals	12/21/2009			12/21/2009			12/22/2009			12/22/2009			12/22/2009			12/22/2009			12/22/2009			12/22/2009			12/22/2009		
Matrix	(ppm)	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
Units		mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Compound			Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF
Aluminum	**NS**	3390			8310			2520			3050			2970			4660			4930			8080			3160		
Antimony	**NS**	1.2	J		0.74	J		0.64	J		1.4	J		0.08	J		ND	J		5.4	J		4.4	J		ND	J	
Arsenic	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Barium	**NS**	6.55			12.2			6.47			7.4			8.28			10.3			7.62			8.76			7.56		
Beryllium	**NS**	0.3	J		0.1	J		0.16	J		0.068	J		0.089	J		0.054	J		0.073	J		0.079	J		ND		
Cadmium	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Calcium	**NS**	843			2890			741			548			951			2200			576			566			655		
Chromium	**36**	17.5			10.1			38.2			30.2			15.7			3.06			1.58			1.55			57.2		
Chromium, Hexavalent	**22**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Cobalt	**NS**	2.1	J		2.8	J		1.9	J		1.9	J		1.8	J		2.3	J		2.5	J		2.3	J		2.1	J	
Copper	**270**	78.1			52.7			13.8			7.19			24.8			16.6			1.08			0.94	J		12.8		
Iron	**NS**	6400			6760			5950			5700			5630			5990			6320			6360			6630		
Lead	**NS**	0.17	J		0.89	J		1.26			0.46	J		0.68	J		0.39	J		ND			ND			0.97	J	
Magnesium	**NS**	1260			1660			1160			1240			1280			1910			1360			1110			1460		
Manganese	**NS**	73.5			73.5			57.3			51.1			54.9			68			60.8			48.3			59.5		
Mercury	**NS**	0.0058	J		0.032	J		0.022	J		0.0068	J		0.023	J		0.017	J		0.022	J		0.029	J		0.005	J	
Nickel	**NS**	2.7	J		3.4	J		2.1	J		2.8	J		2.3	J		2.6	J		2.4	J		2.4	J		2.4	J	
Potassium	**NS**	92	J		110			124			99	J		145			195			127			96	J		146		
Selenium	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Silver	**NS**	0.13	J		ND			0.19	J		ND			0.15	J		0.21	J		ND			0.41	J		0.31	J	
Sodium	**NS**	47	J		48	J		57	J		50	J		63	J		69	J		56	J		52	J		54	J	
Thallium	**NS**	ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J	
Vanadium	**NS**	4.3	J		ND			4	J		4.2	J		2.9	J		4.8	J		4	J		ND			5.2	J	
Zinc	**NS**	52.5	J		17.4	J		14.8	J		14.5	J		14.8	J		26.4	J		15	J		14.7	J		17.3	J	

LEGEND

	Indicates Concentration above the ROD-Specific C
DF	Dilution Factor
Q	Quality Notes
J	Estimated Value
S	Spike Recovery outside accepted recovery limits
ND	Non Detect above the method detection limit
NS	No Standard
mg/kg	milligrams per kilogram
ppm	parts per million
NA	Not analyzed

Sample ID Lab Sample Number Sampling Date Matrix Units	ROD-Specific Clean-Up Goals (ppm)	CS-64 091231002-004A 12/29/2009 Soil mg/kg			CS-71 091231001-002A 12/30/2009 Soil mg/kg			CS-73 091231002-003A 12/30/2009 Soil mg/kg			CS-74 091231001-001A 12/30/2009 Soil mg/kg			CS-76 091231002-002A 12/30/2009 Soil mg/kg			CS-80 091231002-001A 12/30/2009 Soil mg/kg			DUP-4 091231002-005A 12/30/2009 Soil mg/kg			CS-82 091231031-001A 12/31/2009 Soil mg/kg			CS-83 091231031-002A 12/31/2009 Soil mg/kg		
Compound			Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF
Aluminum	**NS**	3900			2930		1	3220			3170		1	2830			2590			3510			1700			2660		
Antimony	**NS**	3.63	J		ND		1	0.12	J		ND		1	ND			0.658	J		2.19	J		2.73	J		0.952	J	
Arsenic	**NS**	ND			ND		1	ND			ND		1	ND			ND			ND			ND			ND		
Barium	**NS**	10			8.47		1	6.39			4.62		1	9.37			11.6			12			3.19			5.79		
Beryllium	**NS**	0.0692	J		0.0376	J	1	0.0379	J		0.396	J	1	0.0419	J		0.0812	J		0.0438	J		ND			0.0149	J	
Cadmium	**NS**	0.0147	J		0.0313	J	1	0.00421	J		0.0539	J	1	ND			0.0146	J		0.00834	J		ND			0.0128	J	
Calcium	**NS**	533			817		1	421			864		1	677			813			918			1210			882		
Chromium	**36**	4.86			6.91		1	70.4			83.2	J	1	1.33			1.46			2.65			99.1	J		91.5	J	
Chromium, Hexavalent	**22**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Cobalt	**NS**	1.9	J		1.95	J	1	1.72	J		1.91	J	1	2	J		1.84	J		2.43	J		1.68	J		1.66	J	
Copper	**270**	2.94			20.9		1	12.1			11.5		1	10.4			0.887	J		1.26			4.64			8.39		
Iron	**NS**	5370			5730	J	1	5110			6340	J	1	5350			5870			6530			6110			5810		
Lead	**NS**	ND			0.481	J	1	ND			6.56	J	1	0.143	J		0.202	J		0.0876	J		1.66			5.9		
Magnesium	**NS**	1070			1300		1	1100			1300		1	1280			1240			1730			1050			1270		
Manganese	**NS**	54.5			66.1		1	36.5			51.5		1	66.1			66.9			83.6			38.7			44.5		
Mercury	**NS**	ND			0.0172	J		ND			0.00487	J		0.055	J		ND			ND			ND			ND		
Nickel	**NS**	2.19	J		1.98	J	1	1.8	J		1.72	J	1	2	J		1.82	J		3.24	J		1.63	J		1.43	J	
Potassium	**NS**	151	J		ND		1	117	J		ND		1	141	J		129	J		167J			108J			159	J	
Selenium	**NS**	ND			ND		1	ND			ND		1	ND			ND			ND			ND			ND		
Silver	**NS**	ND			ND		1	0.0379	J		ND		1	0.652	J		0.171	J		0.131	J		0.605	J		ND		
Sodium	**NS**	ND			ND		1	ND			ND		1	ND			ND			ND			ND			ND		
Thallium	**NS**	ND	J		ND	J	1	ND	J		ND	J	1	ND	J		ND	J		ND	J		ND	J		ND	J	
Vanadium	**NS**	2.67	J		3.95	J	1	2.59	J		4.33	J	1	3.01	J		3.24	J		4.88	J		4.5	J		4.14	J	
Zinc	**NS**	42.8			16.2		1	14.1			17.7		1	24.1			12.7			17.3			12.4	J		16	J	

LEGEND

	Indicates Concentration above the ROD-Specific C
DF	Dilution Factor
Q	Quality Notes
J	Estimated Value
S	Spike Recovery outside accepted recovery limits
ND	Non Detect above the method detection limit
NS	No Standard
mg/kg	milligrams per kilogram
ppm	parts per million
NA	Not analyzed

Appendix F
Analytical Data
NYSDEC Work Assignment # D006131
Northeast Gravure Site Number 5-46-029

Sample ID		CS-84			CS-91			CS-93			CS-94			CS-98			CS-99			CS-103			CS-105			DUP-5		
Lab Sample Number		100106003-006A			100106003-007A			100106003-003A			100106003-004A			100106003-005A			100106003-002A			100106003-001A			100106003-008A			100106003-009A		
Sampling Date		1/4/2010			1/5/2010			1/5/2010			1/5/2010			1/5/2010			1/5/2010			1/5/2010			1/5/2010			1/5/2010		
Matrix	ROD-Specific	Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil			Soil		
Units	Clean-Up Goals (ppm)	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Compound			Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF		Q	DF
Aluminum	**NS**	3400			3880			3420			5340			2450			7570			4680			4670			3270		
Antimony	**NS**	ND			ND			ND			ND			ND			ND			ND	J		ND			ND		
Arsenic	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Barium	**NS**	7.08			9.31			6.3			6.6			3.33			15.8			12.2			11.7			4.07		
Beryllium	**NS**	ND			0.021	J		0.032	J		0.059	J		ND			ND			0.059	J		ND			ND		
Cadmium	**NS**	0.0084	J		ND			ND			ND			ND			0.048	J		0.14	J		0.089	J		0.03	J	
Calcium	**NS**	631			775			785			572			445			710			878			3600			540		
Chromium	**36**	8.42			15			44.6			3.36			68.3			2.76			26.8			5.76			102		
Chromium, Hexavalent	**22**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Cobalt	**NS**	1.9	J		2.2	J		2	J		2	J		1.3	J		1.8	J		2.1	J		2	J		1.7	J	
Copper	**270**	27.5			192			315			46.4			45.7			2.74			48.2			45.8			73.2		
Iron	**NS**	5280	J		6550	J		5710	J		5640	J		5070	J		6260	J		5830	J		5420	J		6380	J	
Lead	**NS**	0.27	J		0.36	J		4.73			0.21	J		1	J		1.81			13.9	J		8.42			1.76		
Magnesium	**NS**	1330			1280			1350			1210			1180			843			1220			1780			1530		
Manganese	**NS**	47.9			69.1			52.1			54.5			27.1			155			66.7			82.4			34.6		
Mercury	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Nickel	**NS**	2.1	J		2.2	J		3	J		1.9	J		4	J		2.3	J		2.6	J		2.4	J		5.9	J	
Potassium	**NS**	172			238			110	J		107			123			77	J		111			134			139		
Selenium	**NS**	ND			ND			ND			ND			ND			ND			ND	J		ND			ND		
Silver	**NS**	ND			ND			ND			ND			5.94			ND			ND	J		ND			7.08		
Sodium	**NS**	ND			ND			ND			ND			ND			ND			ND			ND			ND		
Thallium	**NS**	ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J		ND	J	
Vanadium	**NS**	4.6	J		3.5	J		3.3	J		2.1	J		2.9	J		4.8	J		4.5	J		3.6	J		4.1	J	
Zinc	**NS**	13.1			29			21.5			14.7			12.3			16.1			43.6			16.6			13.4		

LEGEND

	Indicates Concentration above the ROD-Specific C
DF	Dilution Factor
Q	Quality Notes
J	Estimated Value
S	Spike Recovery outside accepted recovery limits
ND	Non Detect above the method detection limit
NS	No Standard
mg/kg	milligrams per kilogram
ppm	parts per million
NA	Not analyzed

Appendix F
Analytical Data
NYSDEC Work Assignment # D006131
Northeast Gravure Site Number 5-46-029

Sample ID	**CS-82**		
Lab Sample Number	**091231031-001A**		
Sampling Date	**12/31/2009**		
Matrix	**Soil**		
Units	**µg/g**		
Compound		Q	DF
TCLP Arsenic	<0.05		
TCLP Barium	0.014	J	
TCLP Cadmium	<0.05		
TCLPChromium	0.2		
TCLP Lead	0.0015	J	
TCLP Selenium	0.012	J	
TCLP Silver	<0.1		
TCLP Mercury	<0.02		

LEGEND

	Indicates Concentration above the ROD-Specific Clean-Up Goals
U	Not Detected
J	Compound Detected below reporting limit
S	Spike Recovery outside accepted recovery limits
E	Compound concentration exceeded the Calibration Range
N	Compound concentration was obtained from diluted analysis
NS	No Standard

Appendix G
Analytical Data Report

Appendix H
Data Validation Report