EXPLANATION OF SIGNIFICANT DIFFERENCE
GENERAL CIRCUITS, INC. SITE

City of Rochester / Monroe County / Site No. 8-28-085 / December 2020

Prepared by the New York State Department of Environmental Conservation
Division of Environmental Remediation

1.0 INTRODUCTION

The purpose of this notice is to describe the progress of the cleanup at the General Circuits, Inc. Site and to inform you about a change in the site remedy. The site is located in an urban area in the City of Rochester, Monroe County near the corner of Buffalo Road and Mount Read Boulevard. On March 31, 2005, the New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) which selected a remedy to clean up the site. In an Explanation of Significant Difference (ESD) dated March 2012, the NYSDEC modified certain elements of the ROD. The remedy selected in the ROD and the 2012 ESD included soil excavation below the on-site building to remove soil containing the greatest concentration of total and hexavalent chromium, and in-situ chemical reduction below the on-site building to address groundwater contaminated with chlorinated volatile organic compounds. During the remedial design, it was determined that it was not feasible to implement these elements of the remedy. To address these concerns, these elements will be replaced by requirements to remove or treat source areas underneath the on-site building when the building is demolished or becomes vacant. The groundwater extraction and treatment element of the ROD, which was expected to only operate for approximately five years, will continue to operate until additional remedial measures to remove or treat source areas underneath the on-site building have been implemented.

This ESD will become part of the Administrative Record for this site. The information here is a summary of what can be found in greater detail in documents that have been placed in the following repository:

Arnett Branch Library
310 Arnett Boulevard
Rochester, NY 14619
Phone: 585-428-8214
Hours: Monday – Thursday 10:00 am to 4:00 pm (subject to change with little notice)

Project documents can also be accessed online through the DECinfo Locator:
https://www.dec.ny.gov/data/DecDocs/828085 and
https://www.dec.ny.gov/data/DecDocs/C828085.

Although this is not a request for comments, interested persons are invited to contact the Department's Project Manager for this site to obtain more information or have questions answered.

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2.0 SITE DESCRIPTION AND ORIGINAL REMEDY

2.1 Site History, Contamination, and Selected Remedy

Location: The General Circuits, Inc. site is located in an urban area near the corner of Buffalo Road and Mount Read Boulevard.

Site Features: The site covers approximately 3.5 acres. The main site features include a 108,000 square foot single story building surrounded by parking areas and roadways. A basement is located under a portion of the building. The basement includes a series of sumps and floor drains that collect water from the foundation drains. This water is discharged to the sanitary sewer.

Current Zoning: The site is currently active and zoned for industrial use. The building is subdivided into spaces that are leased to small light-industrial and commercial businesses. The surrounding parcels are currently used for a combination of commercial and industrial purposes. The nearest residential area is located on the east side of Mount Read Boulevard about 100 ft. from the site.

Past Site Uses: The original portion of the building was constructed in the 1920s and used for a printing business until the early 1960s. General Circuits began manufacturing printed circuit boards at the site in the early 1960s and continued operations until 1990 when it closed as a result of bankruptcy. Several expansions were constructed in the 1960s and 1970s that increased the floor space of the building to the current size.

Historic activities that appear to have led to site contamination include the use of chlorinated solvent degreasers and the use of chromic acid to etch circuit boards.

In 1990, General Circuits filed for bankruptcy and closed its manufacturing operations. As part of the facility closure, General Circuits conducted an environmental assessment of the property. The investigation indicated that the groundwater was contaminated with chlorinated volatile organic compounds (VOCs). In 1991, the site was sold to a corporate relative of the current owner.

In 1992, the owner installed a groundwater treatment system to treat water that accumulates in the sumps prior to discharging the water to the sanitary sewer. Additionally, 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 one where hazardous waste presents a significant threat to the public health or the environment and action is required.

In 1996, additional sampling was performed by the owner. The results indicated that groundwater under the building was also contaminated with chromium. The owner subsequently excavated a limited amount of chromium contaminated soil from under the building. Confirmatory

tests indicated, however, that chromium contaminated soils were still present.

In 1998, the owner signed Consent Order for a Remedial Investigation/Feasibility Study. The project transitioned and from 2005 until 2017, the site was addressed under the NYSDEC's Brownfield Cleanup Program (BCP; see Site C828085). In 2017, the owner ended their participation in the BCP and signed another Consent Order.

Site Geology and Hydrogeology: The surface of the site is generally covered with the building, asphalt or concrete. Beneath the cover layer is a layer of fill material between 1 and 5-feet thick. The fill material consists mainly of reworked soil with some concrete, crushed stone, asphalt, cinders, brick, ceramic tile, coal, slag, ash and glass. The native soil located beneath the fill material is mostly sand with lesser amounts of gravel, silt, clay and weathered rock.

The top of the bedrock underlying the site ranged from approximately 8 to 17 feet below the existing ground surface. The bedrock is Lockport Dolomite which is a hard and fractured dolomite. Groundwater flow in the bedrock is dominated by fracture networks.

The permanent water table at the site is located in the overburden, approximately 6 to 12 feet below ground surface. Groundwater in the overburden and shallow bedrock within approximately 50 to 75 feet of the basement sump flows radially toward the sump. Beyond the influence of the sump, groundwater on the eastern portion of the site is generally flat while groundwater on the western side of the site appears to flow toward the southwest.

Groundwater in the deep bedrock (approximately 38 feet below ground surface) on the western half of the site flows radially toward the basement sump. Deep groundwater on the eastern half of the site flows toward the southeast.

NATURE AND EXTENT OF CONTAMINATION:
Based upon investigations conducted to date, the primary contaminants of concern include both trivalent and hexavalent chromium, and chlorinated volatile organic compounds, specifically trichloroethene (TCE), tetrachloroethene (PCE) and associated degradation products.

Soil:
Chromium, in the form of chromic acid, was apparently released to the subsurface soil and groundwater in north-central area of the building. In 1996, some soils were excavated from the chromium source area to a depth of about 3.7 feet below grade. Confirmatory soil samples detected total chromium at concentrations ranging from 2,390 parts per million (ppm) to 21,400 ppm. The highest hexavalent chromium concentration detected during the remedial investigation was 3,800 ppm at a depth of 8 to 10 feet below grade. Elevated concentrations of chromium were detected beneath the building adjacent to the primary source area and extending to just outside the building to the north and at depths ranging from just below the building slab down to 12 to 15.5 feet below the slab. The unrestricted use soil cleanup objectives (SCOs) for chromium are 30 ppm for trivalent chromium and 1 ppm for hexavalent chromium. The protection of public health for commercial use SCOs for chromium are 1,500 ppm for trivalent chromium and 400 ppm for hexavalent chromium. The protection of groundwater SCO for hexavalent chromium is 19 ppm.

TCE and PCE were found in a limited area of deeper soil (about 9 feet below grade) located just south southwest of the chromium source area. The highest concentrations of TCE and PCE in soil were 14 ppm and 32 ppm, respectively. For TCE and PCE unrestricted use SCOs and the

protection of groundwater SCOs are the same; 0.47 ppm for TCE and 1.3 ppm for PCE.

Groundwater:
Prior to startup of the groundwater extraction and treatment system in 2008, total chromium was detected at concentrations up to 52,300 parts per billion (ppb) which significantly exceeds the groundwater standard of 50 ppb. The well with the highest chromium concentration was an overburden well located southeast of the chromium source area. The groundwater collected from this well was bright yellow in color which is indicative of high hexavalent chromium concentrations. Chromium contaminated groundwater was primarily located under the building. Chromium concentrations declined substantially outside of the building and near the property line. The highest concentration of total chromium detected outside the building was 53.5 ppb detected in a deep bedrock monitoring well near the northeast corner of the building.

TCE, PCE and their associated degradation products were found in groundwater at concentrations significantly exceeding groundwater standards (typically 5 ppb). The highest concentrations of TCE (up to 59,000 ppb) and PCE (up to 95,000 ppb) indicate the presence of dense non-aqueous phase liquid (DNAPL). The highest concentrations of chlorinated VOCs were located the overburden groundwater under the central portion of the building. Concentrations were highest in the overburden and shallow bedrock to a depth of about 20 feet below ground with concentrations above groundwater standards extending into the bedrock to a depth of approximately 50 feet below ground.

Chlorinated VOC concentrations declined substantially outside of the building and near the property line. The highest concentration of chlorinated VOCs outside the building was 144 ppb detected in a deep bedrock monitoring well near the northeast corner of the building, which is also near the eastern site boundary.

The most recent groundwater samples (June 2020) detected total chromium at concentrations up to 18,100 ppb under the building and 747 ppb in an extraction well just north of the building. Under the building TCE and PCE were detected in an extraction well at concentrations up to 43,300 ppb and 6,170 ppb, respectively. TCE and PCE were not detected outside of the building footprint, but the associated degradation compounds cis-1,2-dichloroethene and vinyl chloride were present in a perimeter extraction well at concentrations of 28.4. and 2.67 ppb, respectively.

For per- and polyfluoroalkyl substances (PFAS), perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported at concentrations of up to 8.0 and 7.4 parts per trillion (ppt), respectively, below the 10 ppt screening levels for groundwater for each. No other individual PFAS exceeded the 100 ppt screening level. The total concentration of PFAS, including PFOA and PFOS, were reported at concentrations of up to 67 ppt, below the 500 ppt screening level for total PFAS in groundwater. 1,4-Dioxane was reported on-site at concentrations of up to 3.6 ppb, exceeding the screening level of 1 ppb in groundwater.

The potential for off-site contaminant migration in groundwater is controlled by a groundwater extraction and treatment system that includes two downgradient groundwater extraction points outside of the building footprint.

Sub-Slab Soil Vapor and Indoor Air:
Installation of a whole building soil vapor intrusion mitigation system was completed in 2020. Prior to mitigation, numerous locations on the occupied first floor exceeded the New York State Department of Health's (NYSDOH) air guideline value for TCE of 2 micrograms per cubic meter

and higher concentrations (up to 51 micrograms per cubic meter) were detected in the unoccupied basement. After mitigation, TCE concentrations met the air guideline value on the first floor and basement air TCE concentrations were reduced from 51 to 3.4 micrograms per cubic meter.

Components of the Previously Selected Remedy:
NYSDEC issued a ROD dated March 2005 that was modified by an ESD dated March 2012. As described in the ROD, the remedy selected to address the contaminants of concern at the site were based on the following criteria: (1) protection of human health and the environment; (2) compliance with New York State standards, criteria and guidance; (3) short-term effectiveness; (4) long-term effectiveness and permanence; (5) reduction of toxicity, mobility or volume; (6) implementability; and (7) cost effectiveness.

Potential remedial alternatives for the General Circuits Site were identified, screened and evaluated in the Feasibility Study (FS) report. Based on the results of the Remedial Investigation and the evaluation of alternatives presented in the FS, a remedy was selected, which was summarized in the ROD and ESD as follows:

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

2. Excavation and off-site disposal of soil containing trivalent chromium with concentrations greater than 1,500 ppm and/or hexavalent chromium with concentrations greater than 50 ppm, to the extent practicable.

3. Extraction and on-site treatment of groundwater followed by in situ chemical reduction.

4. Installation of a permanent vapor mitigation system in the basement. Specific components of the system (e.g. sealing the sumps, additional ventilation, etc.) will be determined as part of the remedial design.

5. Maintenance of the site's existing protective cover (asphalt/concrete pavement, flooring, etc.) to prevent exposure to contaminated soils and to minimize storm water infiltration.

6. Development and implementation of a Site Management Plan (SMP) to:

(a) address residual contaminated soils that may be excavated from the site during future redevelopment and site maintenance activities. The plan requires soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations;
(b) evaluate the potential for vapor intrusion for any new buildings or building additions developed on the site, including provision for mitigation of any impacts identified;
(c) provide for the operation and maintenance of the components of the remedy including the protective cover and the sub-slab depressurization (SSD) Interim Remedial Measure (IRM);
(d) monitor the groundwater, treated groundwater, soil vapor, and indoor air; and
(e) identify any use restrictions on site development or groundwater use.

7. A requirement for the property owner to provide an IC/EC certification, prepared and submitted by a professional engineer or environmental professional acceptable to the NYSDEC, annually or for a period to be approved by the NYSDEC, which certifies that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has

occurred that will impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation and maintenance or soil management plan.

8. Imposition of an institutional control in the form of an environmental easement that:
(a) requires compliance with the approved site management plan;
(b) limits the use and development of the property to restricted commercial and restricted industrial uses only (health care and day care uses will also be prohibited without a waiver from NYSDEC);
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Monroe County Health Department; and
(d) requires the property owner to complete and submit to the NYSDEC IC/EC certification.

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

3.0 CURRENT STATUS

A brief summary of the status of the primary remedial components of the selected remedy is as follows:

1. Groundwater Treatment:
The groundwater extraction and treatment system has been operating since July 2008. The system was expanded in 2013 to more effectively treat the chlorinated solvent source areas. The system currently consists of five extraction wells and the basement sump inside the building and two downgradient extraction wells outside the building. The groundwater extraction system depresses groundwater levels throughout the targeted capture zone, provides hydraulic containment to help prevent off-site migration of groundwater contaminants, and removes chromium and chlorinated solvent contamination from the capture zone. The treatment system for the extracted groundwater has consistently met the applicable sewer use effluent limits since start-up.

An Interim Site Management Plan (updated November 2013) and a Construction Completion Report (updated October 2013) were prepared for the groundwater extraction and treatment system and are available for review at the document repository (see Section 1.0). The groundwater extraction and treatment system is currently being operated in accordance with the operation, maintenance and monitoring requirements of the Interim Site Management Plan.

The groundwater extraction and treatment system was expected to operate for approximately 5 years before being replaced by in-situ treatment of groundwater via injections of a reducing agent under the building, such as zero valent iron. During the preliminary design, it was determined that injections under the building were not implementable unless the building was vacant or demolished.

2. Mitigation of Soil Vapor Intrusion:
An Interim Remedial Measure was initiated to mitigate TCE indoor air concentrations exceeding NYSDOH vapor intrusion guidelines on the occupied first floor. Specifically, installation of a sub-slab depressurization system (SSDS) underneath the most impacted portions of the building

was completed in January 2005 to mitigate the potential for contaminated sub-slab soil vapors to enter the building. Air purifiers were also subsequently installed on the first floor and in the unoccupied basement to supplement the SSDS. Subsequent indoor air sampling results indicated that these systems reduced TCE indoor air concentrations to below DOH guidelines in most, but not all, of the first floor. Then in 2015, the DOH air guideline value for TCE was lowered from 5 micrograms per cubic meter to 2 micrograms per cubic meter, and additional building-wide action was needed to comply with the new guideline. Under a Corrective Measures Plan, the SSDS was expanded to depressurize the entire building footprint except for the basement. In the basement, a positive pressure system was installed to mitigate the potential for vapor intrusion. After mitigation, TCE concentrations met the air guideline value on the first floor, and basement air TCE concentrations were reduced from 51 micrograms per cubic meter to 3.4 micrograms per cubic meter. An updated Construction Completion Report and Interim Site Management Plan are being developed.

3. Soil Excavation and Removal:
A 90% complete Remedial Design package was prepared in February 2013, but further work was placed on hold when it was determined that the plan was not implementable unless the building was vacated or demolished.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCE

4.1 New Information

New information obtained since the issuance of the ROD and 2012 ESD:

- The determination that soil excavation under the occupied building is not implementable because it would require relocating over 60% of the tenants in the building for up to four years based on the engineering assessment conducted as part of the remedial design;
- The determination that injections under the occupied building to treat groundwater are not implementable because it would require relocating most of the tenants in the building based on the engineering assessment conducted as part of the remedial design;
- Termination of the Brownfield Cleanup Agreement;
- NYSDEC and the owner entering into an Order on Consent to modify the remedy; and
- Groundwater data identifying the presence of the emerging contaminant 1,4-dioxane, at concentrations exceeding screening levels.

4.2 Comparison of Changes with Original Remedy

The primary differences between the current remedy (original ROD and 2012 ESD) and the amended remedy in this ESD are summarized as follows:

- The current remedy requires excavation and off-site disposal of soil containing trivalent chromium with concentrations greater than 1,500 ppm and/or hexavalent chromium with concentrations greater than 50 ppm, to the extent practicable. It was determined this is not implementable. The amended remedy defers removal or treatment of the chromium source until the building is vacant or demolished. The amended remedy also requires removal or treatment of volatile organic compound sources once the building is vacant or

demolished. Specific means and methods for implementing the amended remedy will be determined in the future when the area becomes accessible.

- The current remedy requires operation of a groundwater extraction and treatment system for approximately 5 years before transitioning to in-situ chemical reduction. It was determined in-situ treatment beneath the building is not implementable. The amended remedy removes the in-situ chemical reduction element and requires the continued operation of the groundwater extraction and treatment system until the building is demolished or vacant and additional remedial measures to remove or treat source areas can be implemented. The groundwater extraction and treatment system will be modified, as needed, during the operating period.
- All elements of the alternative remedy are revised to be consistent with the current standardized descriptions for remedial elements.

Additional details are provided in Table 1.

A comparison of the changes from the current remedy to the amended remedy is presented below for each of the considerations used in the ROD remedy selection process.

1. Protection of Human Health and the Environment: Both the current remedy and the amended remedy are protective of public health and the environment for the site's future restricted commercial and industrial use. Contaminant source areas are located under the building. Both remedies rely on institutional and engineering controls to prevent human exposure and control contaminant migration.

2. Compliance with New York State Standards, Criteria, and Guidance: By removing much of the chromium source material, the current remedy complies with standards criteria and guidance to a greater extent than the amended remedy in the near term. The entire site is covered by building or pavement so both remedies are equally protective in terms of surface soil. The amended remedy requires removal or treatment of volatile organic compound and chromium source areas once the building is demolished or becomes vacant. In the long-term, this may allow for a more complete removal of source material with the amended option.

Neither the current remedy nor the amended remedy is expected to achieve groundwater standards in the source area in the near term. The groundwater extraction and treatment system has reduced groundwater concentrations. The amended remedy requires that that this system continue to operate, and it is expected to continue to remove contaminants that diffuse from soil and bedrock into groundwater. A long-term monitoring program will be used to evaluate the effectiveness of the system and the system will be modified, as needed. Under the current remedy, long-term groundwater treatment would be achieved by replacing the extraction and treatment system with in-situ injections of a chemical reducing agent. The two approaches are expected to be similarly effective since some sources of groundwater contamination would remain for some time under either option.

3. Short-Term Effectiveness: The amended remedy will not require any additional remedial elements inside the building while the building is occupied. As such, the amended option does not require existing tenants to be displaced and does not interrupt site business activities. The institutional and engineering controls including the cover system, groundwater extraction system, and soil vapor intrusion mitigation systems will continue to operate and will be monitored, evaluated, and modified as needed.

With the current remedy, remediation activities, especially the chromium soil excavation, there is some potential for building occupants to be exposed to airborne contaminants. This can be managed by the proper design and use of engineering controls. The amended remedy eliminates this concern by deferring source removal until the building is vacant of demolished.

4. Long-Term Effectiveness and Permanence: By waiting until the building is vacant or demolished, the amended remedy may allow for a more complete and permanent removal of source material in the long-term. It is unknown when the building will be vacant or demolished so for purposes of this ESD it is assumed to be 30-years.

For groundwater treatment, the amended remedy relies on the long-term operation of the groundwater extraction and treatment system. The treatment system is located in the unoccupied basement. While the system includes storage and treatment tanks that are actively vented to the outside, it is possible that some of the volatile organic compound vapors enter the basement air and contribute to the indoor air exceedances in the basement. This concern would be partially addressed under the current remedy when the groundwater extraction and treatment system is replaced by in-situ chemical reduction. Even with the current remedy, some groundwater treatment would still be required to treat basement sump water before it is discharged to the sanitary sewer.

In-situ chemical reduction is also advantageous because it is less energy-intensive and more sustainable than the long-term operation of the groundwater extraction and treatment system.

5. Reduction of Toxicity, Mobility or Volume: The current remedy would remove approximately 1,200 tons of soil. Under the amended remedy, soil removal (or another source remedy) would be deferred until the building is vacant or demolished. In the long-term the improved access of the amended remedy could allow for greater source removal of both chromium and volatile organic compounds.

For groundwater, the in-situ chemical reduction of groundwater has the advantage of converting some of the hexavalent chromium to trivalent chromium which is less toxic and less mobile. In-situ chemical reduction also does not require transfer of contaminants to treatment media or additional treatment at a wastewater treatment plant.

The continued operation of the groundwater extraction system under the amended remedy has the advantage of having demonstrated hydraulic control and preventing off-site migration. In-situ chemical reduction would also be expected to control off-site migration, but this would have to be verified. In addition, the treatment system could, if necessary, be modified to treat 1,4-dioxane.

6. Implementability: During the remedial design, it was determined that the current remedy is not implementable because it would require 60% to 100% of the building be vacated and the impacted tenants be relocated for one to four years while remediation activities were completed. By deferring additional remedial elements under the building while the building is occupied, the amended option does not require existing tenants to be displaced and does not interrupt site business activities. In addition, waiting until the building is vacant or demolished could allow for the implementation of more aggressive and complete remedial options.

7. Cost-Effectiveness: For purposes of comparison to the cost estimates provided in the ROD and 2012 ESD, a new cost estimate was developed for this ESD using the same costs and

factors used in the ROD (i.e., costs normalized to 2005 dollars). The estimate for the net present worth of the current remedy is approximately $3,800,000 (2005 dollars). The corresponding ESD net present worth estimate is approximately $5,200,000 (2005 dollars). The amended remedy cost estimate does not include costs associated with remedial actions that will take place once the building is vacant or demolished. Groundwater treatment for the amended remedy is also less efficient than the current remedy because the cost per pound of contaminant removed increases over time for extraction and treatment systems. Additional details for the cost estimates are provided on Table 2.

Based on the above considerations, this ESD is observed to possess the following advantages over the current remedy in the ROD and 2012 ESD:

- This ESD is implementable; and
- Deferring additional remedial elements under the building until the building is vacant or demolished may result in a more comprehensive remedy in the future.

The ROD selected remedy shall be amended to read:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

    - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
    - Reducing direct and indirect greenhouse gases and other emissions;
    - Increasing energy efficiency and minimizing use of non-renewable energy;
    - Conserving and efficiently managing resources and materials;
    - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
    - Maximizing habitat value and creating habitat when possible;
    - Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
    - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
    - Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for commercial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

3. Groundwater extraction and treatment will be implemented to treat contaminants in groundwater and to ensure contaminated groundwater does not migrate off-site. The

groundwater extraction system will be designed and installed so that the capture zone is sufficient to cover the areal and vertical extent of the chromium, chlorinated volatile organic compound, and 1,4-dioxane (as needed) source areas and intercept the groundwater contaminant plume to stop further migration. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction wells within the plume area. Groundwater will be extracted from the subsurface from the area of the groundwater contaminant plume shown on Figure 2 using a submersible pump placed in extraction wells screened from approximately 8 to up to 39 feet.

The extracted groundwater will be treated using adsorption and liquid phase adsorption using granular activated carbon (GAC). Chromium contaminants in groundwater will be removed from extracted groundwater through adsorption. Contaminated groundwater will be passed through a granular solid or other porous material, such as tree bark with ionically charged receptor sites. The metal contaminants will be adsorbed to the bark. GAC will be used to remove dissolved contaminants from extracted groundwater by adsorption. The GAC system will consist of one or more vessels filled with carbon connected in series and/or parallel. Following treatment, the groundwater will be discharged to the sanitary sewer.

4. Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

   - require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
   - allow the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
   - restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
   - require compliance with the Department approved Site Management Plan.

5. Installation of a permanent vapor mitigation system in the basement. Specific components of the system (e.g. sealing the sumps, additional ventilation, etc.) will be determined as part of the remedial design.

6. A Site Management Plan is required, which includes the following:

   a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: The Environmental Easement discussed in Paragraph 4 above.

   Engineering Controls: The soil cover discussed in Paragraph 2, the groundwater extraction and treatment system discussed in Paragraph 3, the soil vapor intrusion

mitigation system for the basement discussed in Paragraph 5, and the soil vapor intrusion mitigation system for the first floor installed as an Interim Remedial Measure.

This plan includes, but may not be limited to:

- an Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision for demolition of the on-site building if and when it becomes unsafe, inactive or vacant;
- a provision for removal or treatment of the chromium and volatile organic compound source areas if and when the building is demolished or becomes vacant;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for the evaluation of the potential for vapor intrusion for any new buildings or building additions developed on the site, including provision for mitigation of any impacts identified;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater and groundwater treatment system to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

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

5.0 SCHEDULE AND MORE INFORMATION

Site remediation will continue in accordance with the ROD, and the various components of the selected remedy, as modified herein. After the remedial party completes the cleanup activities, they will prepare a Final Engineering Report and submit it to NYSDEC. The Final Engineering Report will describe the cleanup activities completed and certify that cleanup requirements have been achieved or will be achieved. When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the Final Engineering Report.

If you have questions or need additional information you may contact any of the following:

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DECLARATION

The selected remedy is protective of public health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

12/04/2020
Date

Frank Sowers, Project Manager
Region 8

12/04/2020
Date

David Pratt, RHWRE
Region 8

12/20/2020
Date

Michael Cruden, Director
Bureau E

12/21/20
Date

Michael J. Ryan, Director
Division of Environmental Remediation

TABLE 1. SUMMARY OF PROPOSED REMEDY CHANGES
General Circuits (No. 828085) Explanation of Significant Differences

COMPONENT OF CURRENT REMEDY INCLUDED IN MARCH 2012 ESD	AMENDED COMPONENT OF REMEDY	BASIS FOR CHANGE/STATUS
1. A remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.	1. A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows: • Considering the environmental impacts of treatment technologies and remedy stewardship over the long term; • Reducing direct and indirect greenhouse gases and other emissions; • Increasing energy efficiency and minimizing use of non-renewable energy; • Conserving and efficiently managing resources and materials; • Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste; • Maximizing habitat value and creating habitat when possible; • Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; • Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and • Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.	Modified to be consistent with current guidance.
2. Excavation and off-site disposal of soil containing trivalent chromium with concentrations greater than 1,500 ppm and/or hexavalent chromium with	Removed	Soil removal under building determined to be infeasible based on engineering assessment during remedial

concentrations greater than 50 ppm, to the extent practicable.		design. The SMP will include provisions for chromium and VOC source removal when accessible.
3. Extraction and on-site treatment of groundwater followed by in situ chemical reduction.	3.Groundwater extraction and treatment will be implemented to treat contaminants in groundwater and to ensure contaminated groundwater does not migrate off-site. The groundwater extraction system will be designed and installed so that the capture zone is sufficient to cover the areal and vertical extent of the chromium, chlorinated volatile organic compound, and 1,4-dioxane (as needed) source areas and intercept the groundwater contaminant plume to stop further migration. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction wells within the plume area. Groundwater will be extracted from the subsurface from the area of the groundwater contaminant plume shown on Figure 2 using a submersible pump placed in extraction wells screened from approximately 8 to up to 39 feet. The extracted groundwater will be treated using adsorption and liquid phase adsorption using granular activated carbon (GAC). Chromium contaminants in groundwater will be removed from extracted groundwater through adsorption. Contaminated groundwater will be passed through a granular solid or other porous material, such as tree bark with ionically charged receptor sites. The metal contaminants will be adsorbed to the bark. GAC will be used to remove dissolved contaminants from extracted groundwater by adsorption. The GAC system will consist of one or more vessels filled with carbon connected in series and/or parallel. Following treatment, the groundwater will be discharged to the sanitary sewer.	In-situ treatment under the building removed because it was determined to be infeasible based on engineering assessment during the remedial design. Added 1,4-dioxane to list of compounds to be removed by the groundwater extraction and treatment system based on new groundwater data detecting 1,4-dioxane above screening levels. Groundwater extraction and treatment is constructed and operating. The SMP will include provisions for source removal or treatment of VOCs and chromium under the building when accessible.
4. Installation of a permanent vapor mitigation system in the basement. Specific components of the system (e.g. sealing the sumps, additional ventilation, etc.) will be determined as part of the remedial design.	Renumbered as Paragraph 5, but otherwise no change	
5. Maintenance of the site's existing protective cover (asphalt/concrete pavement, flooring, etc.) to prevent exposure to contaminated soils and to minimize storm water infiltration.	2. A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for commercial use.	Modified to be consistent with current guidance.

	Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).	
6. Development and implementation of a Site Management Plan (SMP) to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment and site maintenance activities. The plan requires soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) evaluate the potential for vapor intrusion for any new buildings or building additions developed on the site, including provision for mitigation of any impacts identified; (c) provide for the operation and maintenance of the components of the remedy including the protective cover and the sub-slab depressurization (SSD) Interim Remedial Measure (IRM); (d) monitor the groundwater, treated groundwater, soil vapor, and indoor air; and (e) identify any use restrictions on site development or groundwater use.	6. A Site Management Plan is required, which includes the following: a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective: Institutional Controls: The Environmental Easement discussed in Paragraph 4 above. Engineering Controls: The soil cover discussed in Paragraph 2, the groundwater extraction and treatment system discussed in Paragraph 3, the soil vapor intrusion mitigation system for the basement discussed in Paragraph 5, and the soil vapor intrusion mitigation system for the first floor installed as an Interim Remedial Measure. This plan includes, but may not be limited to: o an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination; o a provision for demolition of the on-site building if and when it becomes unsafe, inactive or vacant; o a provision for removal or treatment of the chromium and volatile organic compound source areas if and when the building is demolished or becomes vacant; o descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions; o a provision for the evaluation of the potential for vapor intrusion for any new buildings or building additions developed on the site, including provision for mitigation of any impacts identified; o a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs); o provisions for the management and inspection of the identified	Modified to: • be consistent with current guidance; • includes provision for future building demolition; • includes provisions to address source areas under the building, when accessible. First floor SVI mitigation system initially conducted as IRM and then expanded under a Corrective Measures Plan. Entire slab now depressurized, and first floor indoor air meets DOH guidance values as of March 2020.

	engineering controls; o maintaining site access controls and Department notification; and o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls. b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to: o monitoring of groundwater and groundwater treatment system to assess the performance and effectiveness of the remedy; o a schedule of monitoring and frequency of submittals to the Department; and o monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above. c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to: o procedures for operating and maintaining the remedy; o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting; o maintaining site access controls and Department notification; and o providing the Department access to the site and O&M records.	
7. A requirement for the property owner to provide an IC/EC certification, prepared and submitted by a professional engineer or environmental professional acceptable to the NYSDEC, annually or for a period to be approved by the NYSDEC, which certifies that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that will impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation and maintenance or soil management plan.	Removed	Incorporated into amended elements 4 and 6 to be consistent with current guidance.
8. Imposition of an institutional control in the	4.Imposition of an institutional control in the form of an environmental	Modified to be consistent with

form of an environmental easement that will (a) require compliance with the approved site management plan; (b) limit the use and development of the property to restricted commercial and restricted industrial uses only (health care and day care uses will also be prohibited without a waiver from NYSDEC); (c) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Monroe County Health Department; and (d) require the property owner to complete and submit to the NYSDEC IC/EC certification.	easement for the controlled property which will: • require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3); • allow the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws; • restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and • require compliance with the Department approved Site Management Plan.	current guidance.
9. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable or not feasible.	Renumbered as Paragraph7, but otherwise no change.	

TABLE 2. SUMMARY OF COST ESTIMATES

General Circuits (No. 828085) Explanation of Significant Differences

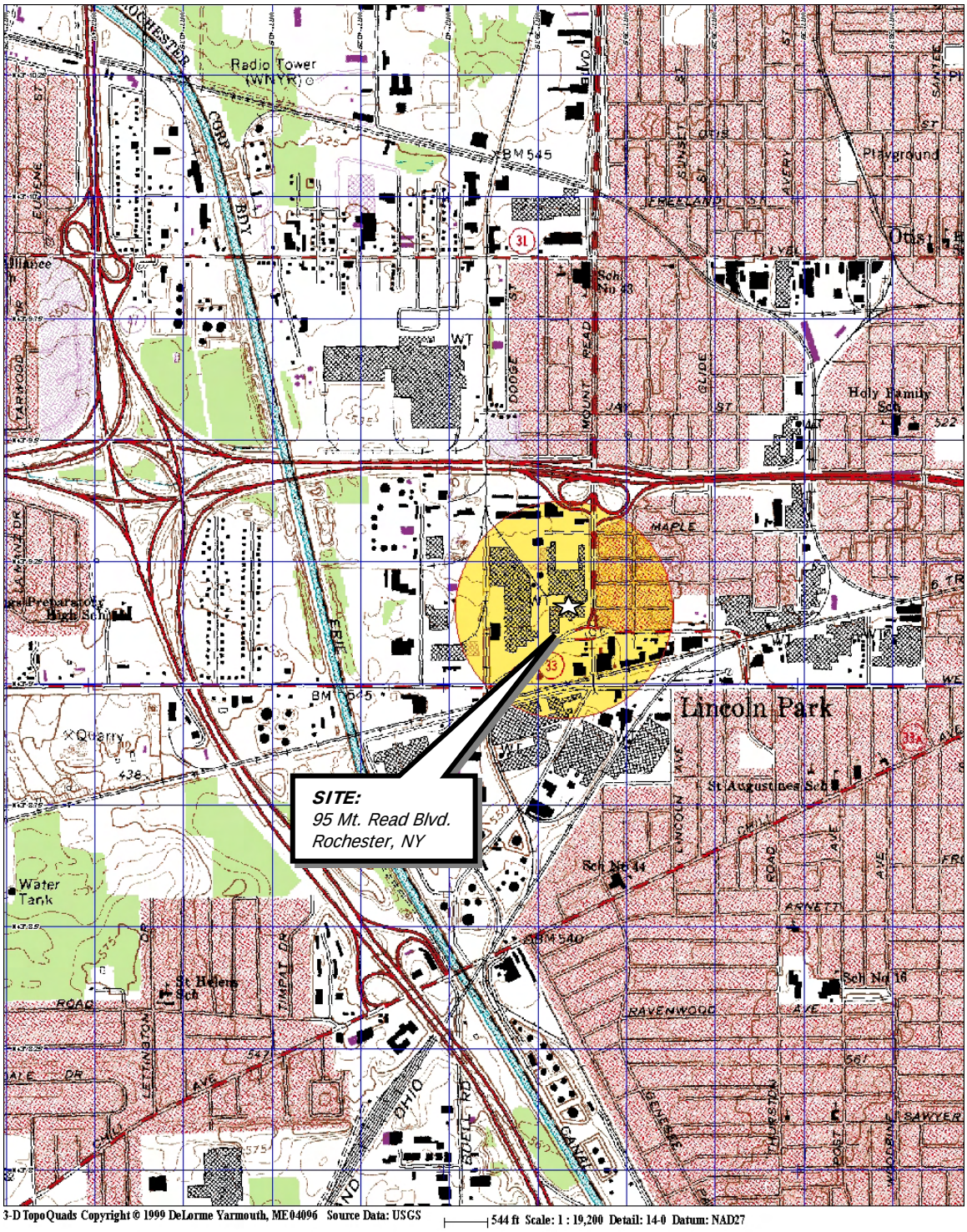
CURRENT REMEDY

Cost Estimate from 2005 ROD:	$3,900,000[a]
Cost Adjustment for 2012 ESD:	-$70,000
Final Estimate:	$3,800,000

ESD REMEDY

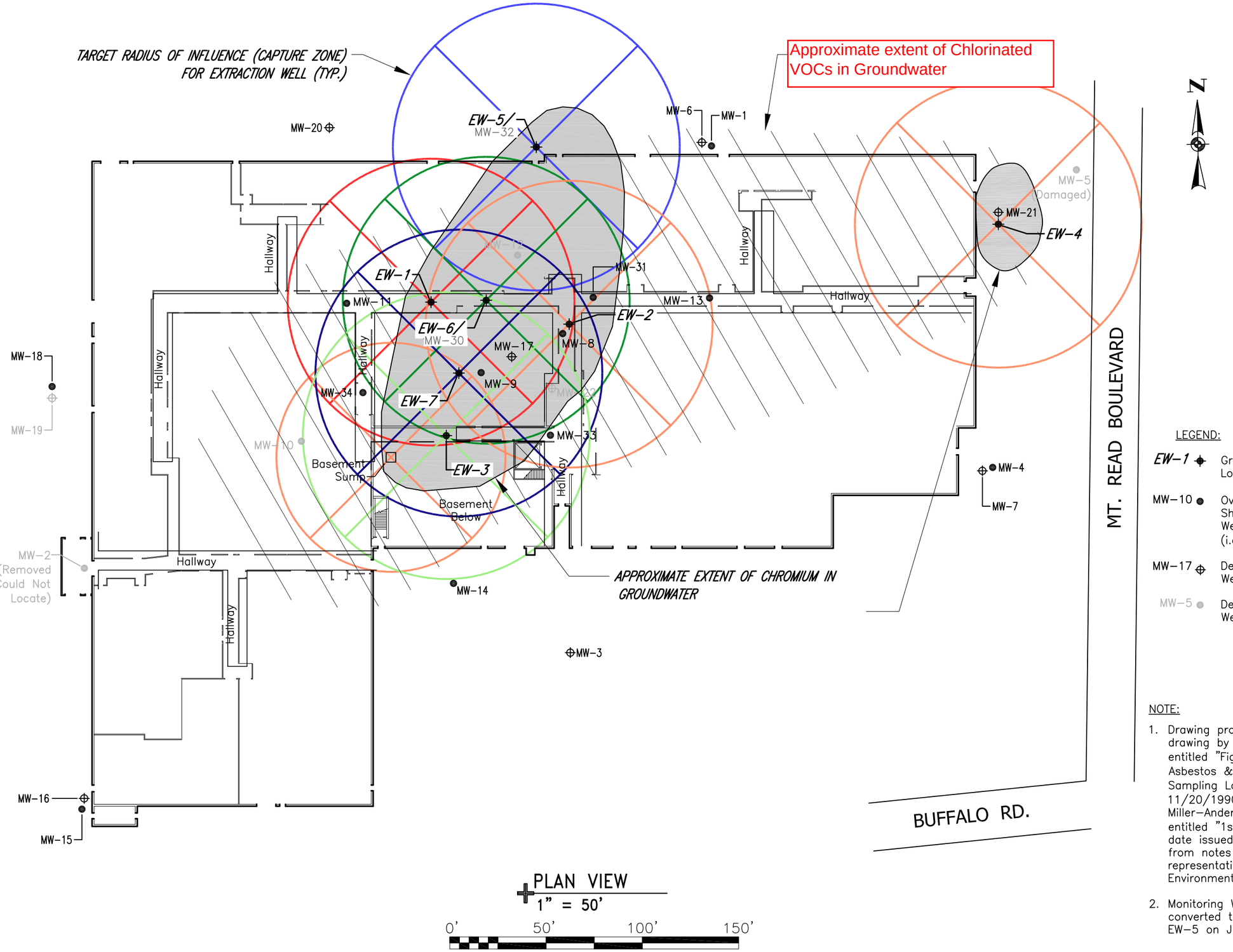
Cost Estimate from 2005 ROD:	$5,200,000[b]

Notes:
1. All costs are present value normalized to 2005 dollars.
a: Source: March 2005 Record of Decision, Table 3, Total of Alternatives S2 and GW5.
b. Source: March 2005 Record of Decision, Table 3, GW3 - Source Area Extraction and Treatment



Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad map Rochester West (NY) 1995. Site Lat/Long: N43d-09.15' – W77d-39.67'

DATE **10-30-2009** DRAWN BY **RJM** SCALE **1" = 2000'**	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008	PROJECT TITLE **95 MT. READ BOULEVARD** **ROCHESTER, NEW YORK** **CONSTRUCTION COMPLETION REPORT** DRAWING TITLE **PROJECT LOCUS MAP**	PROJECT NO. **3681R-05** **FIGURE 1**



PLAN VIEW
1" = 50'

0' 50' 100' 150'

LEGEND:

- EW-1 ✦ Groundwater Extraction Well Location
- MW-10 ● Overburden and/or Shallow Bedrock Monitoring Well Location (i.e. Bedrock Interface Well)
- MW-17 ⊕ Deep Bedrock Monitoring Well Location
- MW-5 ● Decomissioned Monitoring Well

NOTE:

1. Drawing produced from a drawing by The ERM Group, entitled "Figure 3-1; PCB, Asbestos & Sediment/Residue Sampling Locations", dated 11/20/1990; A blueline print by Miller-Anderson Architects, entitled "1st Floor Plan Details", date issued 3-3-2000; and from notes of site visits by representatives of Day Environmental, Inc.
2. Monitoring Well MW-32 was converted to Extraction Well EW-5 on June 17, 2009.

FIELD VERIFIED BY: NES	DATE: 3-2010		
DRAWN BY: RJM/Tw	DATE DRAWN: 8-2013	SCALE: 1" = 50'	DATE ISSUED: 8-26-2013

DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14606
NEW YORK, NEW YORK 10170

PROJECT TITLE: 95 MT. READ BOULEVARD ROCHESTER, NEW YORK

CONSTRUCTION COMPLETION REPORT

DRAWING TITLE: Well Location Plan

PROJECT NO. 3681R-05

FIGURE 2

Ref1:
Ref2:
Ref3:
Xerox432AnsiB-2; 11 x 17
Layout Name: Layout1
Pen Setting File: Maguire95-1.ctb
Time Plotted: Wednesday, August 28, 2013 8:57:18 AM
File Name: P:\Drawings\Maguire\3681R\CCR Aug 2013\Figure 2.dwg