Environmental
Resources
Management

5788 Widewaters Pkwy.
Dewitt, NY 13214
(315) 445-2554
(315) 445-2543 (fax)

1 February 2002

Mr. Mark P. Mateunas, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11 Floor
625 Broadway
Albany, New York 12233-7010

ERM®

RE: Ground Water Pump and Containment
System Decommissioning Report
David Axelrod Institute Site (Site No.: 401031)
ERM Project No.: EC190.00

Dear Mr. Mateunas:

Environmental Resources Management, Inc. (ERM) prepared this report to document the removal of the ground water pump and containment system at the New York State Department of Health (NYSDOH) David Axelrod Institute, located at 120 New Scotland Avenue in Albany, New York (the site; Figure 1, Attachment A). This letter report documents removal of the system and ancillary equipment from the property and briefly describes potential alternative remedial strategies and options for the site. Subsequent sections of this report present project background, system removal activity, monitoring well abandonments, waste and residual management, alternative remedial strategy options, and conclusions and recommendations.

PROJECT BACKGROUND

The NYSDOH has operated a biological laboratory at their New Scotland Avenue facility since 1919. Prior to the use of the site by the NYSDOH, the site was used as the Albany County Almshouse. A pauper's cemetery believed to have been operated by the Almshouse is present throughout the southern portion of the site.

Between 1989 and 1991, ERM conducted environmental investigations to estimate the environmental effects of used solvent disposal "burn pit" located south of the laboratory. The burn pit was located just north of a topographic low that had previously been identified as a swamp in

archived 1914 and 1917 topographic maps. An extensive number of soil borings and monitoring wells were installed in the vicinity of the burn pit to estimate the extent of contamination and to evaluate the underlying geology and hydrogeology. The resulting investigation revealed debris and fill in the subsurface overlying glacial silt and clay.

The environmental investigation also identified a large number of human gravesites located throughout the area surrounding the burn pit. In an earlier study by the NYS Cultural Resources Survey, graves and other historical artifacts were found to the north of the burn pit, in the area near the former coalbunker.

The site investigation identified volatile organic compounds (VOC's) in exceedance of applicable standards and guidance values in the soil and groundwater adjacent to the pit. The subsequent feasibility study conducted by ERM identified six potential remedies. In accordance with the ROD issued by the NYSDEC in March of 1992, the NYSDOH implemented remedial alternative No. 4. The selected remedy called for the installation of a clay or synthetic cap over the affected area, ground water recovery and treatment and institutional controls. The cap is defined by the area underlain by the low lying "bowl" in the silt and clay. The installation of the cap and treatment system was complete in 1993.

Ground water recovery began in 1993 and has continued for more than six years . A review of ground water elevation data collected in the monitoring wells since 1990 reveals that ground water levels constituent concentrations are unaffected by treatment system pumping A review of the historical groundwater monitoring data show the following related to the operation of the system:

1. The installation of the cap has been effective in reducing vertical infiltration of precipitation and subsequent migration of dissolved organic constituents in groundwater;

2. Concentrations of compounds in groundwater have remained constant despite the continuous operation of a groundwater recovery system;

3. Operation of the pump and treatment system has had little effect on groundwater levels or mass recovery and is not effective at exerting hydraulic control over the affected area; and

4. There was increasing evidence that the water being recovered by the groundwater recovery system is derived from infiltration and lateral movement from offsite.

Due to the ineffectiveness of the groundwater pump and containment system and as provided in Option No. 4 of the ROD, NYSDOH was obligated by an Order on Consent to prepare a System Removal Plan. ERM prepared a treatment system decommissioning plan dated July 2001. The final plan was approved by the NYSDEC in a letter dated 6 August 2001.

SYSTEM REMOVAL ACTIVITIES

On 20 and 21 August 2001 an ERM geologist mobilized to the site to conduct oversight services during the removal of the ground water pump and containment system. ECOR Services, Inc. (ECOR) of Woodbury, New York preformed the tank cleaning and system dismantling while Aquifer Drilling and Testing, Inc (ADT) of Albany, New York decommissioned the medium and deep monitoring wells at the site. A photographic log of the system and site activities associated with the system removal is included in Appendix B, attached.

Electrical Disconnection

ERM and ECOR met with Mr. Bill Stone the NYSDOH facility maintenance manager to locate the electrical breakers for the pump and containment system within the NYSDOH facility. Mr. Stone indicated the breakers servicing power to the system were set to the off position. Mr. Stone indicated that he would have one of the facility's electrician remove the breakers from the service panel and secure the system feed wires. ECOR cut the electrical service wires on the outside system breaker panel. The wires were tapped to a pull string and pulled from the electrical service junction box approximately two feet below grade into the rigid conduits. The rigid conduits were then cut at grade and filled with foam insulation so that the pull string was exposed allowing for access of electrical service at the site in the future, if required.

Fence and Electrical Panel Disconnection

On 20 August 2001 ECOR removed the chain link fence, electrical panel racks and ancillary equipment associated with the ground water pump

and containment system. The chain link fence was detached from the fence posts, rolled up and staged for metal recycling. The fence posts and electrical panel racks were also cut at grade and staged for metal recycling.

Containment Tank Cleaning

On 20 August 2001 ECOR removed from service and steam cleaned the 5,000-gallon duel containment polypropylene storage tank. The tank was accessed through a man-way located at the top of the tank. Decontamination water was vacuumed out from the bottom of the tank into a Tonawanda Tank Transport Service, Inc. tanker truck. A hole was cut into the side of the containment tank near the bottom in order to steam clean the sludge and decontamination water into an area where the sludge and water could be easily vacuumed out by the tanker truck. One gallon of Simple Green™ detergent was mixed with and sprayed through steam cleaner to thoroughly spray down and clean the sidewalls and bottom of the containment tank. The steam cleaning process generated approximately 700 gallons of wastewater.

Containment Tank Dismantling

On 21 August 2001 ECOR cut the 5,000-gallon containment tank into thirds using electric saws. The tank thirds were then cut into smaller pieces and placed in a roll-off container for disposal. The bolts that secured the tank to the tank-pad were all cut at grade.

Monitoring Well Decommissioning

On 20 August 2001 ADT permanently decommissioned monitoring wells MW-2M, MW-4M, MW-4D, MW-5M, MW-7D, MW-8M and MW-11M. The protective curb boxes and guard pipes were removed from the ground and placed in the metal recycling pile. The monitoring wells were grouted in place using a Portland cement/bentonite grout mixture to preclude a pathway for future contamination of the deep saturated zone. Monitoring wells MW-1M, MW-3S, MW-6S, MW-9S and MW-9M were not located at the site and are believed to have been either paved over or permanently destroyed during site construction activities. Monitoring well MW-3M was located with the protective guard pipe cut off and the casing filled with miscellaneous soils, gravel and debris. A cement/bentonite grout mixture was placed over the destroyed

monitoring well MW-3M. The recovery well was cut off below grade and capped with a J type plug for future accessibility. A schematic plan showing the locations of the decommissioned monitoring wells, the monitoring wells that were not located and the shallow monitoring wells that were left in place is detailed in Figure 2, Appendix A, attached.

Waste Handling

Waste generated during the dismantling of the ground water pump and containment system was separated into waste water, scrap demolition and metal recycling. Approximately 4.06 tons (973 gallons) of residual tank water, steam cleaner decontamination water and sludge were vacuumed from the containment tank by Tonawanda Tank Transport Service, Inc. and transported to CECOS International for recycling and disposal. The waste manifests are attached in Appendix C. Metal generated from the system dismantling was staged for recycling. The decontaminated polypropylene duel containment tank and associated piping along with miscellaneous ancillary system components were staged in a roll-off dumpster for appropriate disposal.

The remedial system is effectively decommissioned. The utilities have been removed and capped. The system components have been destroyed and specific monitoring wells have been decommissioned.

REMEDIAL ALTERNATIVE TECHNOLOGIES

In accordance with the Record of Decision (ROD) for the New Scotland Site (I.D. Number 401031) signed and dated 26 March 1992 and in a letter from the NYSDEC dated 1 August 2000, "To comply with the ROD, other efforts should, therefore, be made to evaluate technologies that would remediate the contaminants."

Listed below are two potential remedial alternative technologies that if applied, may serve toward reaching permanent removal of the site contaminants. ERM has briefly summarized the two potential remedial alternative technologies for site use consideration by the NYSDEC.

Multi-Phase Extraction Application

Multi-Phase Extraction (MPE) is the process of applying a high vacuum, typically greater than 15-inches of Hg vacuum, to an extraction well or

trench to simultaneously extract soil vapor, groundwater and liquid phase product from the subsurface.

The high vacuum is generated by a water or oil sealed liquid ring pump. The vacuum that is induced at the extraction point creates airflow toward the well and into the inlet piping. The airflow entrains free liquids (water and product) and transfers these liquid back toward the pump. Prior to entering the pump, the vapor and mist enter a vapor/liquid inlet separator. Entrained free liquids are separated from the vapor and transferred by pump to a treatment system or to discharge. Vapor exits through a demisting element in the inlet separator travels through the liquid ring pump and discharges to a treatment system or release to atmosphere.

There are several key and proven benefits to the application of the MPE technology for the remediation of impacted soil and groundwater versus the use of single or two phase down-hole pumping systems.

Because MPE operates at relatively high vacuum, there is a pressure gradient (driving force) toward the extraction point. Remediation timeframes are reduced and a greater amount of contaminant is recovered. Removal rates of hundreds of pounds of contaminants per day is typical. The radius of influence created by the high vacuum MPE process is far greater than can be achieved by liquid pumping under atmospheric pressure and soil vapor extraction at low vacuum. As a result, fewer extraction points are required with high vacuum MPE. MPE creates horizontal oil flow through oil-wet soil toward the extraction point. This reduces oil entrapment and smearing. The airflow generated by the MPE system simultaneously reduces residual soil impacts concurrent with liquid product removal.

MPE systems have been successfully commissioned in Canada and the United States extracting and treating contaminants such as gasoline, diesel, jet fuel and chlorinated solvents. MPE systems are available as skid-mounted, enclosed or trailer mounted packages. Optional liquid and vapor treatment systems are available.

Hydrogen Release Compound Application

Hydrogen Release Compound (HRC) is an innovative product that is used to stimulate in-situ degradation of chlorinated solvent compounds found in ground water and soil. HRC is a proprietary, environmentally safe,

food quality polylactate ester specially formulated for the slow release of lactic acid upon hydration. The HRC is applied to the subsurface via direct push-point injection or within dedicated wells. The HRC formula is then left in place where it passively works to stimulate rapid contaminant degradation.

The process by which HRC operates is a rather complex series of chemical and biologically mediated reactions. Initially, when in contact with subsurface moisture, the HRC slowly releases lactic acid. Indigenous anaerobic microbes (such as acetogens) metabolize the lactic acid producing consistent low concentrations of dissolved hydrogen. The resulting hydrogen is then used by other subsurface microbes (reductive dehalogenators) to strip the solvent molecules of their chlorine atoms and allow for further biological degradation. When in the subsurface, HRC continues to operate in this fashion for a period of a year's time, cost effectively degrading a wide range of chlorinated aliphatic hydrocarbons (CAHs) including common groundwater pollutants such as PCE, TCE, TCA as well as their daughter products.

HRC has several advantages over other remedial options. When compared to other remediation approaches, HRC technology has considerable advantages:

1. Low Capital Cost: Unlike mechanical treatment systems or active chemical oxidation approaches to remediation, HRC application requires low capital costs as it is relatively inexpensive and is generally applied to the subsurface through push-point type applications;

2. Low Operation and Maintenance Cost: Unlike actively engineered systems, the use of HRC requires no continuous mechanical operation, therefore operating and maintenance costs are eliminated;

3. Minimal Site Disturbance: Treatment with HRC is in situ; thus, above ground disturbance is minimized;

4. Rapid Treatment: By supplying a consistent low level of hydrogen over time, the dechlorination process is stimulated to increase in the subsurface by orders of magnitude. This results in a very rapid removal of the CAH contamination when compared to natural

attenuation approaches which may require years of costly monitoring and high site liability.

WELL REPLACEMENT AND ONGOING MONITORING

During the well decommissioning ERM observed that monitoring well's MW-3S, MW-6S and MW-9S were destroyed and/or paved over prior to decommissioning activities. As per the NYSDEC requirements of the decommissioning plan, the three monitoring wells need to be replaced. Their replacements meet the requirement for monitoring and sampling of the shallow ground water monitoring wells (MW-3S, MW-6S, MW-8S, MW-9S MW-10S and MW-11S) at the site. The NYSDEC requires that the shallow site monitoring wells be sampled every five quarters. The additional sampling will estimate whether the removal of the system had an affect the ground water and to reestablish a baseline without the influence of the pumping system. Ground water samples are to be collected and analyzed for volatile organic compounds (VOC's) by using USEPA Method 8260. After the completion of four rounds of monitoring and sampling, the site will be re-evaluated.

The NYSDEC requires that if a down-gradient monitoring well contains VOC's above NYSDEC ground water quality standards during one of the four scheduled monitoring and sampling events, a second groundwater sample from the affected down-gradient well will be collected. The sample will be collected and submitted to the laboratory for analysis within one week after receiving the results for the scheduled monitoring and sampling event. Upon confirmation of VOC's exceeding NYSDEC ground water quality standards within the down gradient well a shallow ground water monitoring well will be installed in the down gradient direction of the affected well and will be included in the scheduled monitoring and sampling plan.

The NYSDEC requires that the cap be monitored during the scheduled sampling events and documented with photographs to be included within the monitoring and sampling reports. The New York State Department of Health Division of Safety and Security will monitor the cap condition periodically between the monitoring and sampling events. ERM will mobilize to the site and provide oversight on any repairs that are deemed and/or warranted.

SUMMARY AND CONCLUSIONS

On 20 & 21 August 2001 ERM oversaw the decommissioning and removal of the treatment the system. Removal activities were preformed in accordance with the NYSDEC approved System Removal Work Plan. The ground water monitoring wells were decommissioned following the NYSDEC Ground Water Monitoring Well Decommissioning Procedures, October 1996, guidelines.

ERM provided a brief overview on Multi-Phase Extraction and Hydrogen Release Compound technologies that may provide beneficial remediation of the site contaminants within the soils and ground water beneath the capped area. A detailed investigation and feasibility study on the implementation of the above remediation technologies can be prepared upon request.

If you should have any questions regarding this letter report please contact me at 315-445-2554.

Sincerely,

Christopher D. Wunderlich, C.P.G
Project Manager

ATTACHMENT A - FIGURES
ATTACHMENT B – PHOTOGRAPHIC LOG
ATTACHMENT C – WASTE DISPOSAL RECORDS
ATTACHMENT D – RESPONSE TO NYSDEC COMMENTS

cc: Ms. Elizabeth Mahoney – NYSDOH
Mr. William Mahoney - NYSDOH
Mr. Andy Carlson – NYSDOH
Mr. Michael Rivara – NYSDOH
Ms. Allsion Elliott - NYSDEC

Environmental
Resources
Management

5788 Widewaters Pkwy
Dewitt, NY 13214
(315) 445-2554
(315) 445-2543 (fax)

17 December 2001

Mr. Mark P. Mateunas, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11th Floor
625 Broadway
Albany, NY 12233-7010

RE: Response to NYSDEC Comments to
Draft System Decommissioning Report
David Axelrod Institute Site
NYSDEC Site Number 401031
Albany, New York
ERM Project Number EC901.00

Dear Mr. Mateunas:

Environmental Resources Management, Inc. (ERM) reviewed your comment letter dated 5 November 2001. A copy of the letter is attached to this response (Attachment A). Your comment letter is in response to ERM's Draft System Decommissioning Report submitted to the New York State Department of Environmental Conservation (NYSDEC) on 24 September 2001. ERM proposed two alternative remedial strategies for the David Axelrod Institute Site (DAI) site in the Draft System Decommissioning Report: multi-phase extraction (MPE) and in-situ treatment with Hydrogen Release Compound™ (HRC).

As requested, ERM is providing estimated capital costs for the implementation of each strategy.

MPE

Workplan	$3,000.00
Pilot Study	$5,000.00
System Design	$12,000.00
Equipment	$80,000.00
Installation	$30,000.00
Quantitation Test	$11,000.00
Startup	$6,500.00

First Year O&M (includes carbon purchase $21,000.00)	$75,000.00
Second Year O&M	$50,000.00
Ground Water Monitoring ($12,000/year for two years)	$24,000.00
Risk Analysis	$12,500.00
System/Site Closure	$35,000.00
TOTAL	$344,000.00

This estimate is based on current site information. It assumes that contaminated air can be effectively treated with carbon and that the system will produce less than 1000 gallons of affected water per month. The above referenced cost is based on ERM's experience at similar sites and does not reflect a site specific engineering cost analysis.

HRC

Workplan	$3,000.00
HRC injection	$100,000.00
Ground water monitoring	$24,000.00
Risk Analysis	$12,500.00
System/Site Closure	$15,000.00
TOTAL	$154,000.00

These costs do not include the costs to replace missing or destroyed monitoring wells.

Please call me at (315) 445-2554 if you have any comments or questions.

Sincerely,

Christopher D. Wunderlich,C. P.G.
Project Manager

Attachment

cc: Ms. Elizabeth Mahoney - NYSDOH
Mr. William Mahoney - NYSDOH

file

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11th Floor
625 Broadway, Albany, New York 12233-7010
Phone: (518) 402-9564 • **FAX:** (518) 402-9022
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

November 5, 2001

Environmental Resources Management
5788 Widewaters Parkway
Dewitt, New York 13214

Attention: Christopher D. Wunderlich, C.P.G.

Dear Mr. Wunderlich:

Re: David Axelrod Institute, Site No. 401031, Albany (C), Albany County
Comments on Draft Groundwater Pump and Containment
System Decommissioning Report

This letter reiterates our October 30, 2001 telephone conversation concerning the above-referenced draft report.

Develop a cost estimate reflecting both the capital costs and yearly operating costs for each remedial alternative discussed and send it to me. Once it is reviewed and approved, include it into the draft to finalize the report and submit two copies to this office.

If you have any questions, please call me at (518) 402-9564.

Sincerely,

/S/

Mark P. Mateunas, P.E.
Environmental Engineer 2
Western Investigation Section

bcc: Tom Reamon via e-mail
Jerry Rider via e-mail
Bob Marino via e-mail
Eric Hamilton via e-mail

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. Box 509 Albany, New York 12201-0509

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

November 7, 2002

Jerry Rider
NYS Department of Environmental Conservation
Bureau of Hazardous Site Control
11th Floor
625 Broadway
Albany, NY 12233-7014

Dear Mr. Rider,

In 2001 we removed the pump and treat system at our David Axelrod Institute Site, 120 New Scotland Avenue (site #401031). The required work plan was submitted in a timely manner, but we have been unable to get a response from your department. I have talked to Mark Mateunas several times over the summer and was assured something would be forthcoming. I left messages for Mr. Mateunas and Mr. Strang in October, but have not received a reply from either of them.

I believe our consent order has expired while we have been awaiting DEC response to the plan. Could you please inform me as to the status of the plan, and give me an idea of what action may be required of the Wadsworth Center.

Thank you for your attention to this matter.

Sincerely,

Laurie H. Duncan
Acting Director of
Safety and Security

cc: Elizabeth Mahoney
William Kerr

Environmental
Resources
Management

5788 Widewaters Pkwy.
Dewitt, NY 13214
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24 September 2001

Mr. Mark P. Mateunas, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11 Floor
625 Broadway
Albany, New York 12233-7010

ERM®

RE: Ground Water Pump and Containment
System Decommissioning
David Axelrod Institute Site (Site No.: 401031)
ERM Project No.: EC190.00

Dear Mr. Mateunas:

Environmental Resources Management, Inc. (ERM) prepared this report documenting the removal of the ground water pump and containment system at the New York State Department of Health (NYSDOH) David Axelrod Institute, located at 120 New Scotland Avenue in Albany, New York (the site; Figure 1, Attachment A). This letter report documents removal of the system and ancillary equipment from the property and briefly describes potential alternative remedial strategies and options for the site. Subsequent sections of this report present project background, system removal activities, monitoring well abandonments, waste and residual handling, alternative remedial strategy options, and conclusions and recommendations.

PROJECT BACKGROUND

The NYSDOH laboratories originally consisted of eight buildings constructed over several decades beginning in the early 1900's on approximately five acres. The DAI is located in an urban area which includes residential, commercial and institutional buildings such as neighboring properties: Albany Collage of Pharmacy, and the New Scotland Avenue Armory now known as University Heights, Albany Medical Facility, and Center Christian Brothers Academy.

The NYSDOH has operated a biological laboratory at their New Scotland Avenue facility since 1919. Prior to the use of the site by the NYSDOH,

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the site was used as the Albany County Almshouse. A pauper's cemetery believed to have been operated by the Almshouse is present throughout the southern portion of the site. The laboratory was closed from 1976 to 1978, after which time the NYSDOH reoccupied and operated the laboratory until the present building. Because the original buildings were inadequate for present-day operation, several of the buildings were demolished and a five-story, 202,000 square foot building was constructed and is now occupied by the NYSDOH.

Between 1989 and 1991, ERM conducted environmental investigations to estimate the environmental effects of used solvent disposal at a former "burn pit" located south of the laboratory. The burn pit was located just north of a topographic low that had previously been identified as a swamp in archived 1914 and 1917 topographic maps. An extensive number of soil borings and monitoring wells were installed in the vicinity of the burn pit to estimate the extent of contamination and to evaluate the underlying geology and hydrogeology. The resulting investigation revealed debris and fill in the subsurface overlying glacial silt and clay.

The subsurface investigation also identified a large number of human gravesites located throughout the area surrounding the burn pit. In an earlier study by the NYS Cultural Resources Survey, graves and other historical artifacts were found to the north of the burn pit, in the area near the former coalbunker. Graves are believed to exist throughout the site, including immediately at the burn pit location. Confirming evidence of graves near the burn pit were identified from the recovery of wood and bone fragments in drill cores collected during the remedial investigation (Note: all recovered bone fragments were re-entered into the originating locations following completion of fieldwork.)

The site investigation identified volatile organic compounds (VOC's) in exceedance of applicable standards and guidance values in the soil and groundwater adjacent to the pit. The subsequent feasibility study conducted by ERM identified six potential remedies. In accordance with the ROD issued by the NYSDEC in March of 1992, the NYSDOH implemented the selected remedial alternative; alternative No. 4. The selected remedy called for the installation of a clay or synthetic cap over the affected area, ground water recovery and treatment and institutional controls. The cap is defined by the area underlain by the low lying "bowl" in the silt and clay. The installation of the cap and treatment system was complete in 1993.

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Ground water recovery began in 1993 and has continued for more than six years . A review of ground water elevation data collected in the monitoring wells since 1990 reveals that ground water levels are unaffected by treatment system pumping. The wells appear to be responding simultaneously to ground water conditions. The variable ground water flow directions observed at the site suggest that the system is responding to localized factors probably associated lateral infiltration through the fill. This is supported by the failure of the pump and treat system to achieve permanent drawdown in the vicinity of the recovery well, as evidenced by the static position of the level-limiting switches for the pump over a period of six years.

ERM has collected ground water samples from site monitoring wells for over five years. During that time, the area of groundwater affected by the VOC constituents from the burn pit has not varied to any great extent. The distribution of compounds is very stable due to impermeable nature of the subsurface and the topographic configuration of the top of the underlying impermeable silt and clay and the presence of an impermeable cap.

Present Site Status

Previous investigations and ground water monitoring, conducted and reported by ERM, indicated that ground water samples collected from the site contain VOCs. The concentrations of VOCs in samples from monitoring well MW-4S located under the impermeable cap exceed New York State Ground Water Standards (NYSGWS). The VOCs detected most often and at highest concentration include; methylene chloride, acetone, toluene, xylenes, benzene, ethylbenzene and trichloroethene. The area of exceedance is proximal to the former burn pit area and located under the cap. A review of the historical groundwater monitoring data show the following related to the operation of the system:

1. The installation of the cap has been effective in reducing vertical infiltration of precipitation and subsequent migration of dissolved organic constituents in groundwater;

2. Concentrations of compounds in groundwater have remained constant despite the continuous operation of a groundwater recovery system;

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3. Operation of the pump and treatment system has had little effect on groundwater levels or mass recovery and is not effective at exerting hydraulic control over the affected area; and

4. There was increasing evidence that the water being recovered by the groundwater recovery system is derived from infiltration and lateral movement from offsite.

Due to the ineffectiveness of the groundwater pump and containment system and as provided in Option No. 4 of the ROD, NYSDOH was obligated by an Order on Consent to prepare a System Removal Plan. ERM assisted the NYSDOH with the implementation of the NYSDEC approved System Removal Plan as described below.

ERM prepared a treatment system decommissioning plan dated July 2001. The final plan was approved by the NYSDEC in a letter dated 6 August 2001.

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On 20 and 21 August 2001 an ERM geologist mobilized to the site to conduct oversight services during the removal of the ground water pump and containment system. ECOR Services, Inc. (ECOR) of Woodbury, New York preformed the tank cleaning and system dismantling while Aquifer Drilling and Testing, Inc (ADT) of Albany, New York decommissioned the medium and deep monitoring wells at the site. A photographic log of the system and site activities associated with the system removal is included in Appendix B, attached.

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preclude a pathway for future contamination of the deep saturated zone. Monitoring wells MW-1M, MW-3S, MW-6S, MW-9S and MW-9M were not located at the site and are believed to have been either paved over or permanently destroyed during site construction activities. Monitoring well MW-3M was located with the protective guard pipe cut off and the casing filled with miscellaneous soils, gravel and debris. A cement/bentonite grout mixture was placed over the destroyed monitoring well MW-3M. The recovery well was cut off below grade and capped with a J type plug for future accessibility. A schematic plan showing the locations of the decommissioned monitoring wells, the monitoring wells that were not located and the shallow monitoring wells that were left in place is detailed in Figure 2, Appendix A, attached.

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Multi-Phase Extraction Application

Multi-Phase Extraction (MPE) is the process of applying a high vacuum, typically greater than 15-inches Hg, to an extraction well or trench to simultaneously extract soil vapor, groundwater and liquid phase product from the subsurface.

The high vacuum is generated by a water or oil sealed liquid ring pump. The vacuum that is induced at the extraction point creates airflow toward the well and into the inlet piping. The airflow entrains free liquids (water and product) and transfers these liquid back toward the pump. Prior to entering the pump, the vapor and mist enter a vapor/liquid inlet separator. Entrained free liquids are separated from the vapor and transferred by pump to a treatment system or to discharge. Vapor exits through a demisting element in the inlet separator travels through the liquid ring pump and discharges to a treatment system or release to atmosphere.

There are several key and proven benefits to the application of the MPE technology for the remediation of impacted soil and groundwater versus the use of single or two phase down-hole pumping systems.

Because MPE operates at relatively high vacuum, the pressure gradient (driving force) toward the extraction point. Remediation timeframes are reduced and a greater amount of contaminant is recovered. Daily removal rates of hundreds of pounds of contaminants is typical. The radius of influence created by the high vacuum MPE process is far greater than can be achieved by liquid pumping under atmospheric pressure and soil vapor extraction at low vacuum. As a result, fewer extraction points are required with high vacuum MPE. MPE creates horizontal oil flow through oil-wet soil toward the extraction point. This reduces oil entrapment and smearing. The airflow generated by the MPE system simultaneously reduces residual soil impacts concurrent with liquid product removal.

MPE systems have been successfully commissioned in Canada and the United States extracting and treating contaminants such as gasoline, diesel, jet fuel and chlorinated solvents. MPE systems are available as skid-mounted, enclosed or trailer mounted packages. Optional liquid and vapor treatment systems are available

DRAFT

Hydrogen Release Compound Application

Hydrogen Release Compound (HRC) is an innovative product that is used to stimulate in-situ degradation of chlorinated solvent compounds found in ground water and soil. HRC is a proprietary, environmentally safe, food quality polylactate ester specially formulated for the slow release of lactic acid upon hydration. The HRC is applied to the subsurface via direct push-point injection or within dedicated wells. The HRC formula is then left in place where it passively works to stimulate rapid contaminant degradation.

The process by which HRC operates is a rather complex series of chemical and biologically mediated reactions. Initially, when in contact with subsurface moisture, the HRC slowly releases lactic acid. Indigenous anaerobic microbes (such as acetogens) metabolize the lactic acid producing consistent low concentrations of dissolved hydrogen. The resulting hydrogen is then used by other subsurface microbes (reductive dehalogenators) to strip the solvent molecules of their chlorine atoms and allow for further biological degradation. When in the subsurface, HRC continues to operate in this fashion for a period of a year's time, cost effectively degrading a wide range of chlorinated aliphatic hydrocarbons (CAHs) including common groundwater pollutants such as PCE, TCE, TCA as well as their daughter products.

HRC has several advantages over other remedial options. When compared to other remediation approaches, HRC technology has considerable advantages:

1. Low Capital Cost: Unlike mechanical treatment systems or active chemical oxidation approaches to remediation, HRC application requires low capital costs as it is relatively inexpensive and is generally applied to the subsurface through push-point type applications;

2. Low Operation and Maintenance Cost: Unlike actively engineered systems, the use of HRC requires no continuous mechanical operation, therefore operating and maintenance costs are eliminated;

3. Minimal Site Disturbance: Treatment with HRC is in situ; thus, above ground disturbance is minimized;

DRAFT

4. Rapid Treatment: By supplying a consistent low level of hydrogen over time, the dechlorination process is stimulated to increase in the subsurface by orders of magnitude. This results in a very rapid removal of the CAH contamination when compared to natural attenuation approaches which may require years of costly monitoring and high site liability.

SUMMARY AND CONCLUSIONS

On 20 & 21 August 2001 ERM oversaw the decommissioning and removal of the treatment the system. Removal activities were preformed in accordance with the NYSDEC approved System Removal Work Plan. The ground water monitoring wells were decommissioned following the NYSDEC Ground Water Monitoring Well Decommissioning Procedures, October 1996, guidelines.

During the well decommissioning ERM observed that monitoring well's MW-3S, MW-6S and MW-9S were destroyed and/or paved over prior to decommissioning activities. As per the NYSDEC requirements of the decommissioning plan, the three monitoring wells need to be replaced. Their replacements meet the requirement for monitoring and sampling of the shallow ground water monitoring wells (MW-3S, MW-6S, MW-8S, MW-9S MW-10S and MW-11S) at the site. The NYSDEC requires that the shallow site monitoring wells be sampled every five quarters. The additional sampling will estimate whether the removal of the system had an affect the ground water and to reestablish a baseline without the influence of the pumping system. Ground water samples are to be collected and analyzed for volatile organic compounds (VOC's) by using USEPA Method 8260. After the completion of four rounds of monitoring and sampling, the site will be re-evaluated.

The NYSDEC requires that if a down-gradient monitoring well contains VOC's above NYSDEC ground water quality standards during one of the four scheduled monitoring and sampling events, a second groundwater sample from the affected down-gradient well will be collected. The sample will be collected and submitted to the laboratory for analysis within one week after receiving the results for the scheduled monitoring and sampling event. Upon confirmation of VOC's exceeding NYSDEC ground water quality standards within the down gradient well a shallow ground water monitoring well will be installed in the down gradient

DRAFT

direction of the affected well and will be included in the scheduled monitoring and sampling plan.

The NYSDEC requires that the cap be monitored during the scheduled sampling events and documented with photographs to be included within the monitoring and sampling reports. The New York State Department of Health Division of Safety and Security will monitor the cap condition periodically between the monitoring and sampling events. ERM will mobilize to the site and provide oversight on any repairs that are deemed and/or warranted.

ERM provided a brief overview on Multi-Phase Extraction and Hydrogen Release Compound technologies that may provide beneficial remediation of the site contaminants within the soils and ground water beneath the capped area. A detailed investigation and feasibility study on the implementation of the above remediation technologies will be prepared upon request.

If you should have any questions regarding this letter report please contact me at 315-445-2554.

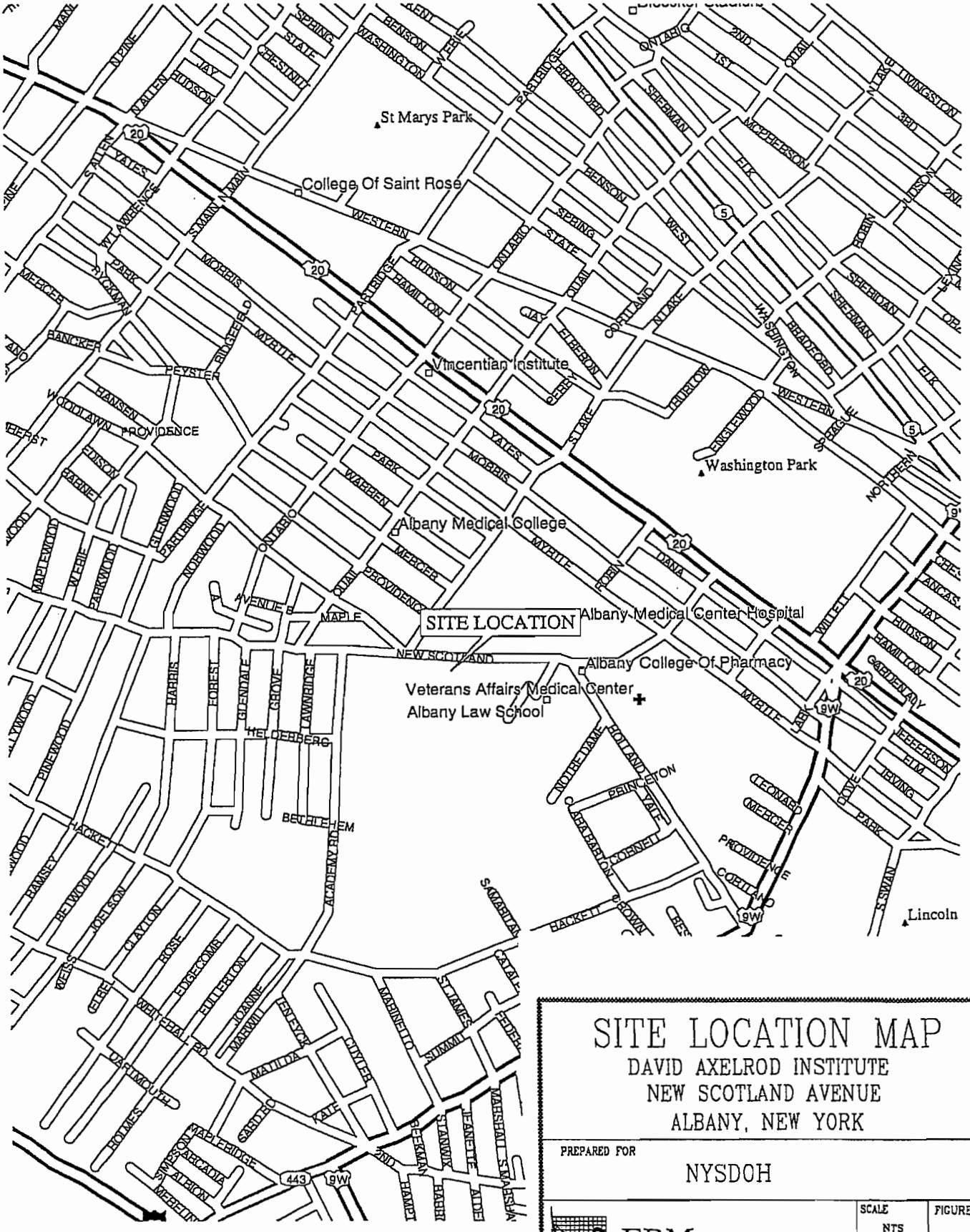
Sincerely,

Christopher D. Wunderlich, C.P.G
Project Manager

ATTACHMENT A - FIGURES
ATTACHMENT B – PHOTOGRAPHIC LOG
ATTACHMENT C – WASTE DISPOSAL RECORDS

cc: Ms. Elizabeth Mahoney – NYSDOH
Mr. William Mahoney - NYSDOH
Mr. Andy Carlson – NYSDOH
Mr. Michael Rivara – NYSDOH
Ms. Allsion Elliott - NYSDEC

ATTACHMENT A
FIGURES



SITE LOCATION MAP

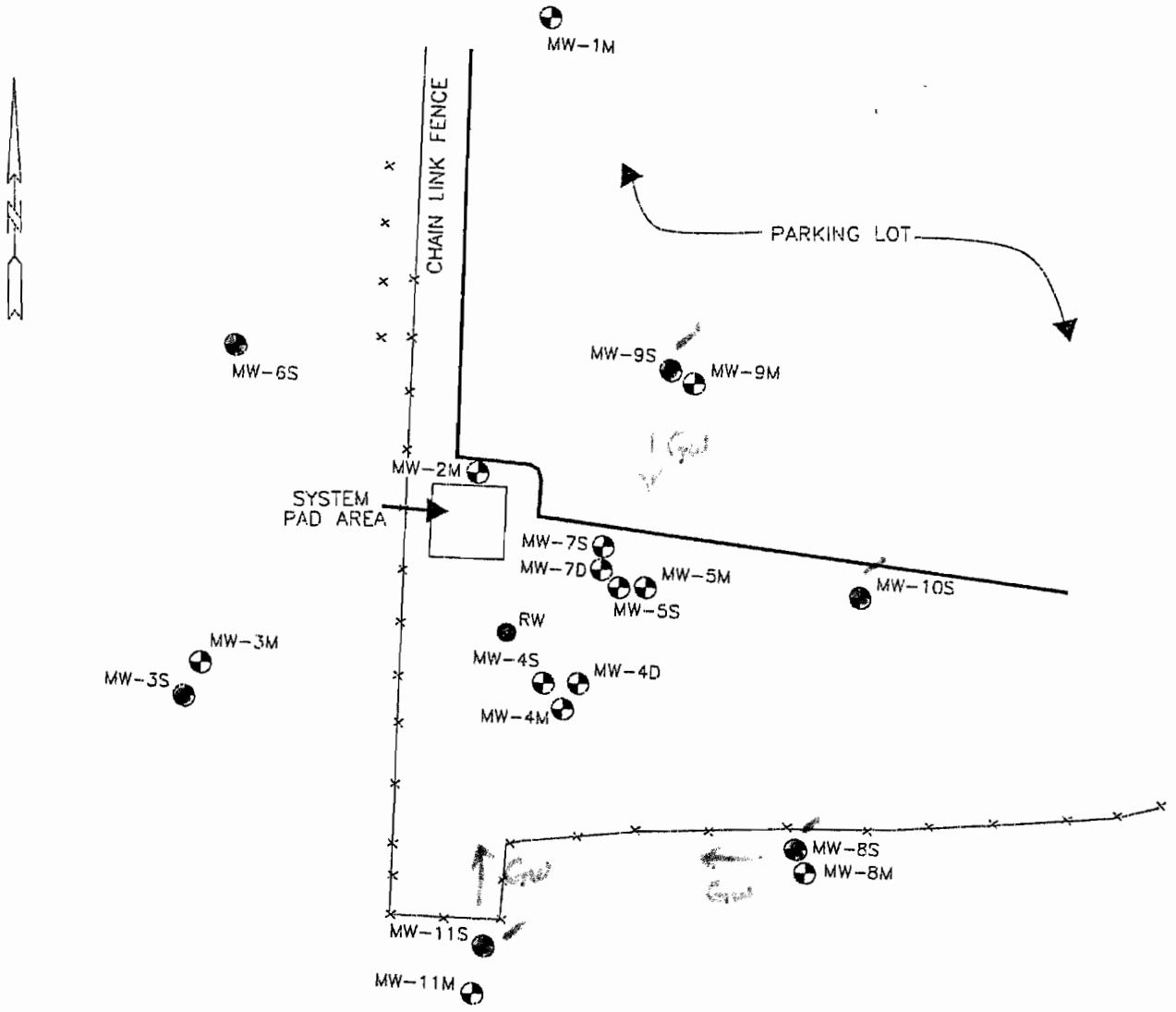
DAVID AXELROD INSTITUTE
NEW SCOTLAND AVENUE
ALBANY, NEW YORK

PREPARED FOR
NYSDOH

ERM

SCALE	FIGURE
NTS	1
DATE 3/01	

NYSDOH



WELL STATUS

- MW-1M – Not Located
- MW-2M – Grouted Closed
- MW-3S – Not Located
- MW-3M – Found Destroyed
- MW-4S – Accessible
- MW-4M – Grouted Closed
- MW-4D – Grouted Closed
- MW-5S – Accessible
- MW-5M – Grouted Closed
- MW-6S – Not Located
- MW-7S – Accessible
- MW-7D – Grouted Closed
- MW-8S – Accessible
- MW-8M – Grouted Closed
- MW-9S – Not Located
- MW-9M – Not Located
- MW-10S – Accessible
- MW-11S – Accessible
- MW-11M – Grouted Cloase
- RW – Capped in Place

LEGEND

MW-5 Monitoring Well

RW Recovery Well

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)

NOTE: Locations are Estimated and Approximate.

WELL LOCATION MAP
DAVID AXELROD FACILITY
ALBANY, NEW YORK

PREPARED FOR

NYS DEPARTMENT OF HEALTH

ERM

ERM

SCALE AS SHOWN

DATE 09/01

FIGURE 2

EC190.00.DWG

ATTACHMENT B
PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

NOTES: "up" is towards the top in all photographs unless otherwise noted. Directional references are approximate. Photographs were taken on 27 March 2001 and 20 & 21 August 2001.

Photograph #01 - Ground water pump and containment system located at the Southwest corner of the David Axelrod Institute Facility parking lot.

Photograph #02 - View of the pump and containment system towards the north.

Photograph #03 - View of the pump and containment system towards the southwest.

Photograph #04 - Steam cleaning the containment tank. Tanker truck vacuuming liquids from steam cleaning process.

Photograph #05 - Inside view of the containment tank (from the top of the tank) near the end of steam cleaning process.

Photograph #06 - Aquifer Drilling and Testing's drill rig used for the monitoring well abandonments.

Photograph #07 - Aquifer Drilling and Testing's support vehicle used for the monitoring well abandonments.

Photograph #08 - Mixing of the bentonite grout slurry used to decommission the monitoring wells.

Photograph #09 - Pumping of the bentonite grout slurry into monitoring well MW-7D.

Photograph #10 - Monitoring well MW-3M found buried approximately one and a half feet below grade. The protective guard-pipe was found sheared off and the well was filled with soil and gravel.

Photograph #11 - A bentonite slurry was placed over monitoring well MW-3M.

Photograph #12 - View of electrical conduits cut to grade and capped with foam insulation.

Photograph #13 - View of recovery well cut six inches below grade and capped with J-plug.

Photograph #14 - Containment tank cut in thirds (top of picture on left side of page).

Photograph #15 - Bottom third of containment tank being cut up for disposal.

Photograph #16 - Metal scraps from fence, light pole and control panels staged for recycling.

Photograph #17 - Tank pad area.

Photograph #18 - Roll-off dumpster with cleaned cut containment tank and associated debris (top of picture on left side of page).

Photograph #19 - View of filled roll-off dumpster.

Photograph #20 - View of decommissioned pump and containment system area.

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #01

Photograph #02

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #03

Photograph #04

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #05

Photograph #06

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #07

Photograph #08

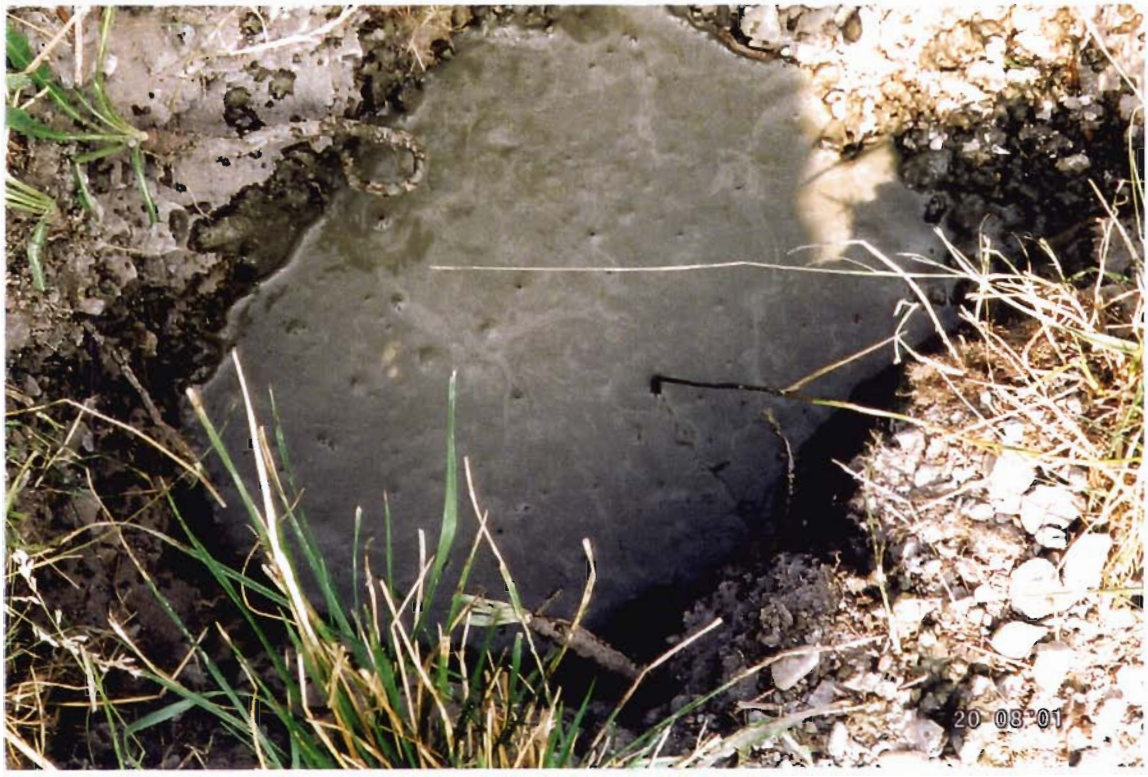
PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #09

Photograph #10

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #11



Photograph #12

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #13

Photograph #14

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #15

Photograph #16

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #17

Photograph #18

PHOTOGRAPHIC LOG
DAVID AXELROD INSTITUTE FACILITY
ALBANY, NEW YORK
NYSDEC SITE NUMBER 401031
ERM PROJECT NUMBER EC190.00

Photograph #19

Photograph #20

ATTACHMENT C
WASTE DISPOSAL RECORDS

TONAWANDA TANK TRANSPORT SERVICE, INC.

1140 MILITARY ROAD
P.O. BOX H
BUFFALO, NY 14217
(716) 873-9703

3618 U.S. ROUTE 42 SOUTH
LEBANON, OH 45036
(513) 398-6997

DATE 08 / 20 / 01

PICK UP	DELIVERY (CONSIGNEE)
NAME: N Y S DEPT. OF HEALTH	NAME: CECOS INTERNATIONAL
STREET: 120 NEW SCOTLAND RD	STREET: 5600 NIAGARA FALLS BLVD
CITY / STATE / ZIP CODE: ALBANY NY.	CITY / STATE / ZIP CODE: NIAGARA FALLS NY.
CONTACT NAME:	CONTACT NAME:
SCHEDULED TIME: 10:30 AM	SCHEDULED TIME:
ADDITIONAL INFORMATION:	ADDITIONAL INFORMATION: 19631 Z NY

PURCHASE ORDER NO.	WORK ORDER NUMBER	MANIFEST NUMBER	PRODUCT CODE
		NYG0681722	

LOAD NUMBER	TRACTOR NUMBER	TRAILER NUMBER	DRIVER'S NAME
10108125	17	405	ERRICK

TYPE (CIRCLE ONE)	MATERIAL DESCRIPTION	QUANTITY
TANK (S/S) (R/L) VAC ~~DUMP~~ VAN ROLL-OFF FLATBED	PERMANIFEST	7006

PICK UP

ARRIVAL TIME 10:30 AM PM RELEASE TIME 1:30 AM PM

TRAILER EMPTY UPON ARRIVAL ☐ YES ☐ NO
(If not, explain below)

DIP MEASUREMENT (Tankers Only) 12½ ~~APPROX~~ INCHES

COMMENTS: (EXPLAIN ALL DELAYS)
7006. 2ST
VAC HOLDING TANK
& WASH

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X James R. Duncan
SHIPPER'S SIGNATURE

DELIVERY

DRIVER ERRICK DATE 8/21/01

ARRIVAL TIME ____ AM PM RELEASE TIME ____ AM PM

TRAILER EMPTY UPON DEPARTURE ☐ YES ☐ NO
(If not, explain below)

COMMENTS: (EXPLAIN ALL DELAYS)
SOLIDS REMAINING IN TANK

I, THE UNDERSIGNED, CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE.

X Richard A. Errick II 8-21-01
CONSIGNEE'S SIGNATURE

OFFICE USE ONLY

DRIVER

TRIP			
TOLLS			
DEMURRAGE			
LAYOVER			
VAC			
MISC		TOTAL:	

ACCOUNTING

DRIVER'S #	
FREIGHT	
TOLLS	
DEMURRAGE	
MISC.	
TOTAL	

WHITE-BILLING COPY YELLOW-TON. TANK COPY PINK-ACCOUNTING COPY GREEN-DRIVER COPY BLUE-TSDF COPY GOLD-GENERATOR COPY

CECOS
5677 S NIAGARA FALLS BLVD
NIAGARA FALLS, NY 14304

000100
SEE GENERATOR
P O BOX 344 LPO
NIAGARA FALLS, NY 145040344

Contact: SPC

SITE 22	TICKET 0894-4	GRID 3A5A
WEIGHMASTER PAM		
DATE IN 21 August 2011		TIME IN 7:35 am
DATE OUT 21 August 2011		TIME OUT 7:39 am
VEHICLE 560-1		ROLL OFF
REFERENCE	ORIGIN Inbound - NEW YORK	

Gross Weight 46,320.00 LB
Tare Weight 38,200.00 LB
Net weight 8,120.00 LB 4.06 TN

TONAWANDA TANK

CECOS

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
4.06 TN	81	Special Waste				

NET AMOUNT

TENDERED

CHANGE

CHECK NO.

(WO# 28431)

SIGNATURE X

TRUCK DEMURRAGE & SPOTTING REPORT (Customer-Arranged Freight or Contract Carrier)

W.O. # 284-32	Customer & Location NYS DOH	Hauler Tona Tank	8-27-01 Date

	Date	Time
Unloading Scheduled	8-21-01	9:30
Arrival		7:40
Lab-In		8:50
Lab-Out		9:05
Departure		9:45

X

Reason for Delay (To Be Completed by CECOS)

No Delay

Service Type (Please circle)
Dump
Roll off
Box Van/Flatbed
Straight tanker
Vac trailer
Vac truck
Straight truck (LTL)

Richard A. Sherman II
Authorized Signature (CECOS Personnel)

Charges to be Billed: Code:

Freight $ ____ ____
Loading ____ ____
Unloading ____ ____

Spotting ____ ____
Other ____ ____
Other ____ ____

White & Canary Accounting Pink Customer

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

NYG 0681732

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please type or print. Do not staple. (Rev. 3/97)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. | Manifest Doc. No. | 2. Page 1 of | Information within heavy bold lines is not required by Federal Law.

3. Generator's Name and Mailing Address: NEW YORK STATE DEPT OF HEALTH, 120 NEW SCOTLAND AVE ALBANY NY 12233

A. NYG 0681732

B. Generator's ID

4. Generator's Telephone Number ( )

5. Transporter 1 (Company Name): TONAWANDA TANK
6. US EPA ID Number: NYD 097644801

C. State Transporter's ID: 7YE 312 NY
D. Transporter's Telephone (716) 873-9703

7. Transporter 2 (Company Name)
8. US EPA ID Number

E. State Transporter's ID
F. Transporter's Telephone ( )

9. Designated Facility Name and Site Address: CECOS INTERNATIONAL INC, 2600 NIAGARA FALLS BLVD, NIAGARA FALLS NY 14304
10. US EPA ID Number: NYD 080336241

G. State Facility ID
H. Facility Telephone ( )

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ HAZARDOUS WASTE, LIQUID, N.O.S. 9, NA3082, PG III (F039)	001		700		EPA / STATE
b.					EPA / STATE
c.					EPA / STATE
d.					EPA / STATE

J. Additional Descriptions for Materials listed Above: a, b, c, d

K. Handling Codes for Wastes Listed Above: a, b, c, d

15. Special Handling Instructions and Additional Information: EMERGENCY / SITE CONTACT LAURIE DUNCAN (518) 474-3215

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: [illegible] | Signature: [signature] | Mo. Day Year: 08 21 01

GENERATOR

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: DAVID PERCK | Signature: [signature] | Mo. Day Year: 08 21 01

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Mo. Day Year

TRANSPORTER

19. Discrepancy Indication Space: Quantity received 4.06 Tons

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Richard A. DiCamillo II | Signature: [signature] II | Mo. Day Year: 08 21 01

FACILITY

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental Conservation (518) 457-7362

COPY 7 — Transporter Copy — Retained by Transporter

file

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9551 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

December 4, 2002

Laurie H. Duncan, Acting Director of Safety and Security
New York State Department of Health
Wadsworth Center
The Governor Nelson A. Rockefeller Empire State Plaza
P.O.Box 509
Albany, New York 12201-0509

Dear Mr. Duncan:

Re: Ground Water Pump and Containment System Decommissionong
David Axelrod Institute Site, Site No. 401031
Albany (C), Albany County

The Department reviewed and verbally approved the above-referenced Ground Water Pump and Containment System Decommissioning dated February 1, 2002 in early Spring 2002. All comments in my November 5, 2001 letter were satisfactorily addressed.

If you have any further questions, please call me at 402-9564.

Sincerely,

Mark P. Mateunas

Mark P. Mateunas, P.E.
Environmental Engineer 2
Operation and Maintenance Section

cc: G. Rider via e-mail
E. Mahoney via e-mail
W. Kerr via e-mail