TRC
Customer-Focused Solutions

OPERATIONS, MAINTENANCE & MONITORING (OM+M) WORK PLAN

Parking Lot Property
685 First Avenue
New York, New York

NYSDEC Voluntary Cleanup Program
Site Number V-00429-2

Prepared By

TRC Engineers, Inc.
New York, New York

TRC Project No. 28410-OM01-9100T

October 2004

TRC
Customer-Focused Solutions

October 21, 2004

Thomas Gibbons, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233 - 7016

Re: Voluntary Cleanup Order/Index Number: D2-0001-01-03
TRC East Side Properties, NY County (Manhattan), City of New York
Site Number V-00429-2, 685 First Avenue

Dear Mr. Gibbons:

In response to NYSDEC's letter dated September 14, 2004, TRC Companies, Inc. ("TRC") hereby submits the finalized Operations, Maintenance & Monitoring (OM+M) Work Plan for the Parking Lot site at 685 First Avenue. Please discard your copies of the July 2004 OM+M Plan. The enclosed October 2004 OM+M Plan replaces the July 2004 OM+M Plan.

Please contact me if you have any questions regarding this submittal.

Sincerely,
TRC Companies, Inc.

Michael A. Skirka, CHMM
Senior Project Manager

Enclosures

cc: Gary Litwin NYSDOH (2 Copies)
Denise D'Ambrosio, Esq. NYSDEC
Jane O'Connell NYSDEC

1200 Wall Street West, 2nd Floor • Lyndhurst, New Jersey 07071
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OPERATIONS, MAINTENANCE & MONITORING (OM+M) WORK PLAN

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Parking Lot Property
685 First Avenue
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NYSDEC Voluntary Cleanup Order
Site Number V-00429-2

October 2004

It is a violation of New York State Law for any person, unless acting under the direction of a licensed professional engineer or land surveyor, to alter an item in any way. If an item bearing the seal of an engineer or land surveyor is altered, the altering engineer or land surveyor shall affix to the item his seal and notation "altered by" followed by his signature and the date of such alteration, and a specific description of the alteration.

10/18/04
Date

Steven D. Meersma, P.E.
NYS Professional Engineer
License Number 076572

1.0 INTRODUCTION

1.1 Project Background

In January 2001, TRC submitted a Voluntary Cleanup Order ("VCO") application to the New York State Department of Environmental Conservation (NYSDEC) for the investigation and remediation of four properties on First Avenue, including the Parking Lot property. NYSDEC subsequently approved the Parking Lot Property for inclusion in the VCO dated June 27, 2001 as Site Number V-00429-2. Under the terms of the VCO (Index Number D2-0001-01-03), TRC is recognized as a "Volunteer" and has taken possessory interest in the Parking Lot Property from the current owner (Con Edison) as of December 1, 2000 for the purpose of conducting investigation and remediation; and any required post-remedial Operation, Maintenance, and Monitoring (OM+M) activities. TRC initiated additional investigative work in March 2001 under its NYSDEC-approved Supplemental Soil Investigation Work Plan and implemented Interim Remedial Measures (IRM) under its NYSDEC-approved IRM Work Plan Supplement 2 (October 2001). After completion of these investigations and remediation, TRC completed a Final Report for IRM Work Plans and Parking Lot Remediation Work Plan (RWP), dated December 2002. From December 2002 to January 2003, TRC implemented the remediation of the NYSDEC-approved RWP. TRC's October 2003 Final Report for the Parking Lot Remediation Work Plan (Final Report) documents the successful completion of soil remediation and reduction in bedrock groundwater contamination at the Site, and is briefly outlined in Section 3.0 of this OM+M Work Plan. OM+M activities were recommended in the Final Report.

The objective of the RWP activities was to ready the Site for unrestricted development for the Contemplated Use (*i.e.,* residential and commercial uses) to a depth which is the top of competent bedrock which ranges from 2 feet to 12 feet bgs ("the Development Depth"), without deed restrictions, institutional or engineering controls or further consents, approvals or authorizations. It was the further objective that following completion of the proposed remediation under the RWP, and subject to any groundwater monitoring that may be required, the Site would be in a condition to be improved to the Development Depth, including installation of pilings to the top of bedrock or caissons and dewatering as necessary, without the need for special (*i.e.,* over and above those which would be required for a site having no Pollution Conditions) worker health and safety protection obligations above the Development Depth.

1.2 Purpose of OM+M Activities

As stated in the NYSDEC-approved RWP, the overall goal of the groundwater remediation at the Site under this OM+M Work Plan will be to meet NYSDEC Class GA Standards or Guidance Values. Groundwater remediation, however, will cease if Oxygen Release Compound (ORC®)-based remediation, or other NYSDEC-required groundwater remediation, reaches asymptotic conditions and NYSDEC agrees that GA Standards are likely to be unachievable.

2.0 SITE DESCRIPTION

The Parking Lot Property (Parking Lot) at 685 First Avenue occupies 1.1 acres in Midtown Manhattan, where it had most recently served as a parking facility for Con Edison maintenance and service vehicles. It lies along the west side of First Avenue between East 39th and East 40th Streets. Figure 1, Site Location Map, shows the general site location and surrounding areas.

2.1 History

Sanborn maps from 1890 to 1928 show that the Site was originally occupied by buildings of unspecified usage. By 1929, the northeastern portion of the site had been developed with an upholstery and mattress factory, and that facility appears to have remained on the Site until the 1960s. The 1950 Sanborn Map shows a United Parcel Service (UPS) sorting center in the western portion of the Site, and a UPS garage on the southern end of the Site. Four storage tanks are shown at the former UPS facility. A 1970 aerial photograph shows that all former on-site structures had been removed by that date. Since 1980, Con Edison has occupied the Site as a parking lot.

2.2 Geology

The project site lies within the Manhattan Prong in the New England Upland Physiographic Province. The bedrock foundations of New York City consist of a sequence of dense and stable crystalline rocks consisting of schist, gneiss, and marble that outcrop mainly in Manhattan and the Bronx. The Supplemental Investigation at the Site, as presented in the IRM Work Plan dated July 2001, included soil sampling, test pitting, and continuous rock cores. This investigation and subsequent site work indicate that surficial fill consists of medium to fine sands, silty sands, bricks, concrete, coal fragments, and bedrock ranging from five to fifteen feet below grade. Bedrock generally lies beneath a mantle of weathered bedrock of varying thickness. For most of the Site, the thickness of the weathered bedrock was between one to two feet. The weathered bedrock was thicker and deeper toward the southeast corner of the Site, mirroring the topography of the competent bedrock surface. At the southeast corner of the Site and elsewhere, VOC-impacted weathered bedrock was removed as part of the IRM's scope of work (See Section 3.0). The competent bedrock surface forms a pronounced basin at the southeast end of the Site, with its center near monitoring well MW-3R and MW-3S, and its edges at the property line (sidewalk) along East 39th Street and First Avenue.

2.3 Hydrogeology

Groundwater generally occurs within the bedrock across the Site from slightly more than six feet to more than fifteen feet below grade. The direction of groundwater flow is estimated to be to the southeast; however, it is likely that the number and degree of interconnected fractures exert a greater control upon the rate of horizontal groundwater flow than the hydraulic gradient. Based upon the limited number of open and connect fractures within the bedrock at the Site, the horizontal conductivity of the bedrock aquifer is very low.

3.0 SITE REMEDIAL ACTION

3.1 Description of Remediation

On behalf of Con Edison, Clean Venture, Inc (CVI) removed two, 4,000-gallon unleaded gasoline, underground storage tanks (USTs) from the Site in 1998. This began investigations and remedial actions by TRC and others. The table below summarizes the remediation undertaken at the site. The RWP and Final Report, submitted under separate cover, provide a detailed account of the remediation and investigations completed by TRC and others to date. As indicated by the findings of the prior remediation and investigations, identified Areas of Concern (AOCs) for the Site requiring remediation have included:

- The presence of gasoline-related compounds, including benzene, toluene, ethylbenzene, and xylenes (BTEX), plus methyl-tert-butyl-ether (MTBE) in the soil/urban fill and weathered bedrock,
- The presence of lead above TAGM RSCOs in the fill at the Site, and
- Dissolved levels of BTEX and MTBE in the fractured bedrock groundwater.

Summary of Action	Date
CVI's removal of two 4,000-gallon USTs, associated piping and pump islands and 500 cubic yards of petroleum impacted soil.	11/98
CVI's removal of additional 1,500 cubic yards of petroleum impacted soil in response to post-excavation soil sampling results.	2 – 3/99
CVI's removal of additional 2,800 cubic yards of petroleum contaminated soil in response to Roy F. Weston's Phase II ESA.	8 – 11/99
Implementation of TRC's Interim Remedial Measures (IRM), which included: • Excavation and off-site disposal of approximately 2,000 cubic yards of petroleum contaminated soil and weathered bedrock, • Application of Oxygen Release Compound (ORC®) to the exposed bedrock surface prior to backfilling and two of the on-site monitoring wells after their reinstallation, • Receptor study to evaluate potential impact to receptors to the south and to the east of the Site, and • Monthly groundwater monitoring and quarterly groundwater sampling and analysis.	7/01 – 5/02
Implementation of TRC's Remediation Work Plan (RWP), which included: • Excavation and off-site disposal of approximately 10,500 tons of VOC and lead-impacted soil, and weathered bedrock, and • Reapplication of ORC® socks in six of the eight bedrock wells and 38 geoprobe injection locations.	12/02 – 1/03

As a result of implementing the IRM and RWP, all soil and fill exceeding TAGM RSCOs has been excavated and disposed off-site. The source of groundwater contamination, residual gasoline in the mantle of weathered bedrock, has been fully removed via excavation, and dissolved groundwater contamination has been treated by utilizing ORC®, a patented product manufactured by Regenesis Bioremediation Products of San Clemente, California. ORC® is a formulation of magnesium peroxide that produces a slow and sustained release of molecular oxygen when in contact with soil moisture or groundwater (A copy of a Material Safety Data Sheet is included in Appendix A). The increase in oxygen, in turn, produces an environment favorable to aerobic microorganisms that can degrade the groundwater contaminants into harmless by-products, such as carbon dioxide and water. In effect, utilizing ORC® seeks to accelerate natural attenuation processes to restore groundwater quality at the site. After removal of the petroleum-impacted soil and weathered bedrock, a solution of ORC® was applied to the exposed bedrock surface. This approach allowed the ORC® to enter the available bedrock fractures and stimulate the breakdown of gasoline related compounds and MTBE by naturally occurring microorganisms. In addition, socks of ORC® were placed into wells MW-1R, MW-2R, MW-3R, MW-4R, MW-5R and MW-6R located within the impacted area of the site. In response to contaminant levels in some wells, an additional ORC® application was deemed necessary and consisted of injecting ORC® into the existing gravel layer above bedrock through 38 injection points via Geoprobe® temporary injection points.

As documented in the Final Report (Tables 10 and 11), as of June 2003, a 90% or greater reduction in MTBE has been achieved in wells MW-1R, MW-2R, MW-3S, MW-3R, and MW-6R. Reductions in total MTBE for wells MW-4R and MW-5R were 63.5% and 75.9%, respectively. The June 2003 MTBE result for MW-4R fluctuated upward from the March 2003 MTBE level which had indicated more than a 90% reduction in MTBE. A 90% or greater reduction in total BTEX has been achieved in MW-3S, MW-3R, MW-4R, and MW-5R. Reductions in total BTEX for other wells were: 12% for MW-1R, 29% for MW-2R, and 84.8% for MW-6R. As detailed in the Final Report, TRC's prior receptor study has indicated that groundwater contaminant levels present no significant risk to potential receptors in the area.

3.2 Achievement of Project Remedial Objectives

The soil and weathered bedrock removal activities at the Site are complete and the remedial objectives for this Site have been met. The Site meets the standards for unrestricted development to the Development Depth without deed restrictions, institutional or engineering controls or further consents, approvals or authorizations. The Site is in condition to be improved to the

Development Depth, including installation of pilings to the top of bedrock or caissons and dewatering as necessary, without the need for special (*i.e.,* over and above those which would be required for a site having no Pollution Conditions) worker health and safety protection obligations above the Development Depth.

A deed restriction will be imposed, to provide that any groundwater must be properly treated for disposal, if removed from the Site, and groundwater may be subject to use restrictions. Annual certification of these restrictions will be required to verify compliance with the deed restriction.

4.0 OM+M ACTIVITIES

4.1 Scope of OM+M Activities

The OM+M activities will consist primarily of monitoring groundwater conditions and groundwater quality in the existing wells shown in Figure 2 and a downgradient well, WS-MW-2R (Waterside) installed downgradient of the site within the Con Edison Waterside Station property on the east side of First Avenue. Procedures for monitoring of groundwater conditions will be consistent with applicable sampling and analytical protocols established in the NYSDEC approved Quality Assurance/Quality Control Program Plan for First Avenue Properties, dated May 2001. Procedures and equipment to implement this OM+M Work Plan are detailed in the following subsection.

4.2 Monitoring Plan

TRC will monitor on a quarterly basis the following groundwater parameters in the following on-site and off-site wells: MW-1R, MW-2R, MW-3S, MW-3R, MW-4R, MW-5R, MW-6R, MW-7R and WS-MW-2R (See Figure 2):

- Dissolved oxygen (DO) levels,
- Oxidation reduction potential (ORP),
- Dissolved and total iron and manganese levels,
- Depth of the groundwater table and thickness of any petroleum phase product layer,
- pH, Temperature, and Conductivity,
- VOC levels in the airspace of the wells, and
- Levels of BTEX and MTBE in the groundwater.

Dissolved Oxygen

Levels of dissolved oxygen (DO) are a primary indicator of the groundwater's suitablity for enhanced bioremediation via aerobic degradation. Levels of DO in wells have ranged from 0.02 to 37 mg/L. The table below summarizes ranges of dissolved oxygen suitable for aerobic bioremediation.

DO Level (mg/L)	Condition for Bio-remediation by Aerobic Microorganisms[1]
<1.0	Unfavorable
2 to 4	Favorable
Greater than 4	Very favorable

[1] Weidemeier, Rifai, Newell, Wilson, 1999

Oxidation-reduction Potential (ORP)

Oxidation-reduction potential (ORP) represents another indicator for evaluating the potential of enhanced bioremediation. Generally, positive values for ORP in the groundwater indicate an absense of free electrons and thereby suggest an oxygen rich environment. ORP values of +100 millivolts (mV) to +200 mV or higher indicate conditions favorable for aerobic degradation.

Dissolved and Total Iron and Manganese

The relative concentration of dissolved and total iron and manganese in the groundwater also can indicate the amount of available oxgyen that is present. Iron and manganese at a higher valence states (Fe^{3+}, Mn^{3+}) typically exist in oxygen rich environment, forming insoluble precipates, and thereby reducing the concentration of these metals dissolved in the groundwater. Thus, a low concentration of dissolved iron and manganese relative to total concentrations of these metals represent an indirect way of evaluating the abundance of available oxygen for enhanced aerobic bioremediaton.

Levels of BTEX and MTBE

TRC will continue the quarterly sampling of groundwater wells, which was initiated to evaluate the effectivenss of the IRM, by analyzing groundwater samples for BTEX, plus MTBE. In addition, TRC will evaluate groundwater conditons at the downgradient, bedrock monitoring well WS-MW-2R. This well is located to the east of the site, on the opposite side of 1st Avenue, between Waterside Generating Station No. 1 and No. 2.

On as-needed basis, TRC will perform necessary repairs and/or replacement of the wells shown in Figure 2. Future development of the Site may require abandonment of the existing wells within the property boundaries prior to completion of OM+M activities. In that case, quarterly monitoring of groundwater will be continued at off-site wells MW-5R, MW-6R and WS-MW-2R.

4.3 Methodologies

The table below lists the instrumentation or method to be utilized for the quarterly monitoring of the aforementioned groundwater parameters.

Parameter	Instrument or Method
Dissolved Oxygen	Dissolved Oxygen Meter and Field Sampling Kit (CHEMetrics), Rhodazine Method
Oxidation Reduction Potential	WTW Multi 340i
Temperature, Conductivity, pH	Meter (Horiba Water Quality Checker) or WTW Multi 340i
Dissolved and Total Iron and Manganese	Field Sampling Kits (Chemetrics or Hach): 1,10-Phenanthroline Method for Iron, Periodate Method for Manganese
Groundwater and Product Levels	Groundwater Interface Meter (ORS Interface Probe)
VOC Levels in Airspace within Wells	Photoionization Detector (PID)

The instrumentation or kits listed above will provide real-time data for the parameters of concern, and therefore will require no sample collection for off-site laboratory analysis. In addition, in-situ measurements of dissolved oxygen, ORP, temperature, conductivity and pH will be obtained by utilizing a downhole probe or a flow cell.

The quarterly groundwater sampling and analysis will be performed in accordance with the requirements of the Quality Assurance and Control Plan. Any ORC® socks in wells will be removed at least one week prior to the groundwater sampling event.

4.4 Evaluation of ORC® Performance

ORC® has demonstrated a capability to release oxygen to the groundwater for six months to one year following an application. The need for additional ORC® applications will be evaluated based upon the results of the groundwater monitoring program (See Section 4.2). Additional applications of ORC® might be warranted if the groundwater monitoring program indicates that the quantity of ORC® applied at the Site is inadequate for the contaminant mass. Criteria for additional application of ORC® are illustrated in Figure 3. If it is determined that an additional ORC® application is required, an ORC® liquid slurry will be injected into the existing subsurface gravel layer installed above the bedrock via Geoprobe® temporary injection points, as indicated in Figure 2. Monitoring wells will not be used as injection wells for ORC® application, but may be used for the passive application of ORC® through diffusion socks.

Closure of the groundwater remediation system will occur after the remediation objectives are achieved or asymptotic conditions are reached, as determined by NYSDEC. That determination to terminate OM+M activities will be made no sooner than following the completion of three or four quarterly groundwater sampling rounds without any ORC® applications. ORC®

applications will continue until either a) such time as NYSDEC agrees that GA standards have been achieved or asymptotic conditions are reached and GA standards are likely unachievable or b) development construction activities are about to commence and NYSDEC is notified that the on-site wells will be abandoned and NYSDEC thereafter determines that no further ORC® applications are required in any off-site wells. The closure of the groundwater monitoring system will consist of abandoning the monitoring wells in accordance with NYSDEC protocol. Future development of the Site may require the abandonment of existing groundwater monitoring wells and the loss of access for ORC® injection via separate Geoprobe® injection points. If that development should occur before NYSDEC-required OM+M activities have been completed and if such wells are still needed at that time to continue remedial efforts, offsite injection and monitoring wells will be installed consistent with the NYSDEC June 22, 2004 letter (Appendix B) in the general locations shown in Figure 2, as approved by NYSDEC.

4.5 Reporting Requirements

The quarterly groundwater field testing data will be recorded on an appropriate field sampling form (See Tables 1 and 2). A quarterly report will be prepared and submitted to NYSDEC documenting the results of the quarterly groundwater sampling, and will include the groundwater sampling results and appropriate graphs and figures showing contaminant trends. With each quarterly report, TRC also will include an evaluation of the overall performance of ORC®.

5.0 OM+M SCHEDULE

The OM+M activities will commence in September 2003, and will continue until the State determines that the remedial goals for the Site, as presented in the Interim Remedial Measures (IRM) Work Plans and Parking Lot Remediation Work Plan (December 2002) and Section 1.2 of this OM+M Plan have been achieved.

6.0 REFERENCES

1. *Supplemental Soil Investigation Work Plan,* First Avenue Properties, New York, New York, TRC, February 2001.

2. *Quality Assurance/Quality Control Program Plan,* First Avenue Properties, New York, New York, TRC, May 2001.

3. *NYSDEC, Division of Environmental Remediation, Draft Technical Guidance for Site Investigation and Remediation*, December 2000.

4. *Technical Assistance Guidance Memorandum HWR-94-4046,* January 24, 1994 and December 20, 2000 revisions (TAGM) Residential Soil Cleanup Objectives (RSCO).

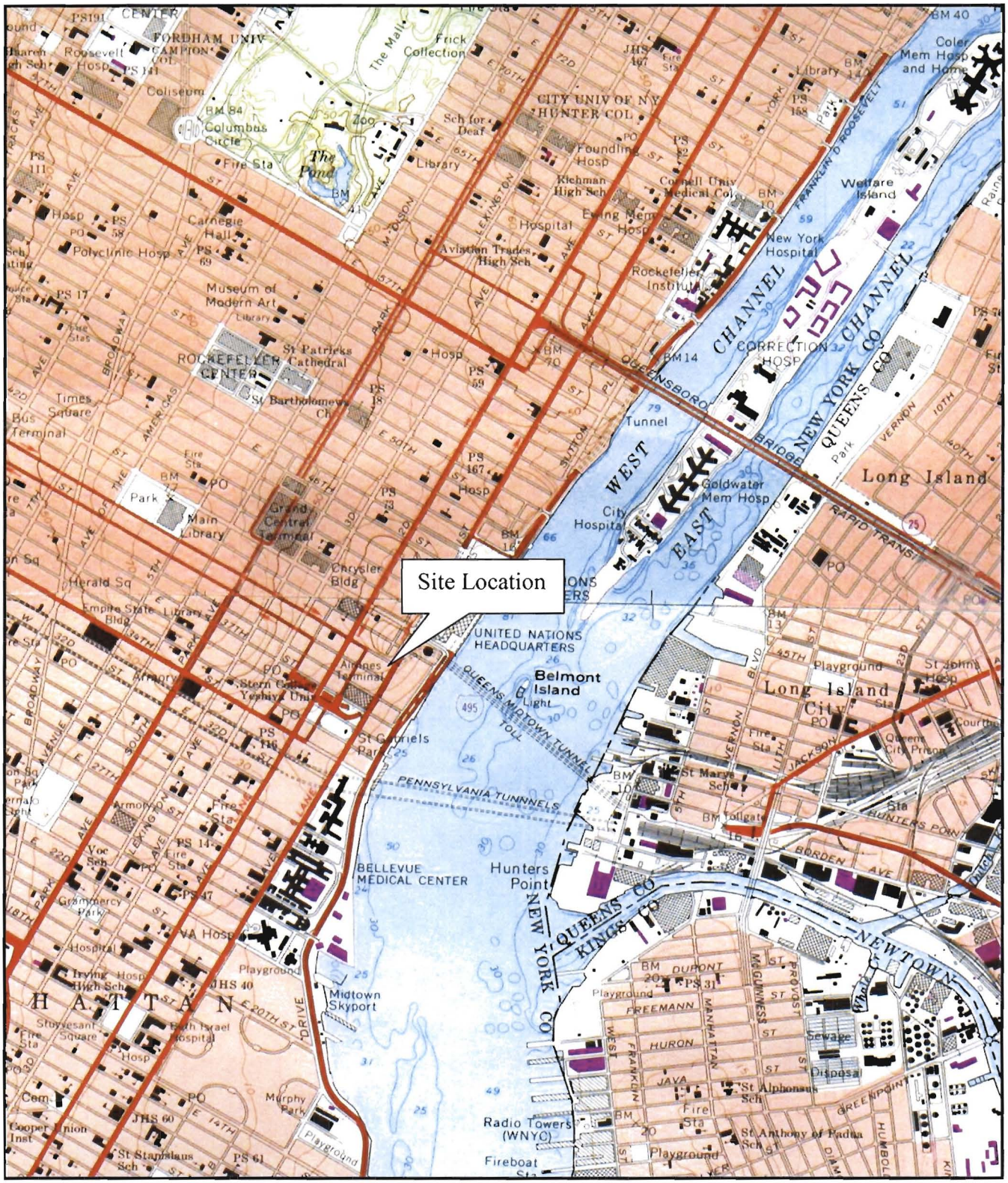
5. Technical and Operational Guidance Series (1.1.1) (TOGS) June 1998.

6. *Spill Technology and Remediation Series (STARS Memo # 1*), August 1992.

7. Baskerville, Charles. A. 1989. *Geology and Engineering Geology of the New York Metropolitan Area.* 28th International Geological Congress, American Geophysical Union, Washington, D.C.

8. Weidemeier, T.H., Rifai, H.S., Newell, C.J., Wilson, J.T., 1999, *Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface*, John Wiley & Sons, New York.

Figures



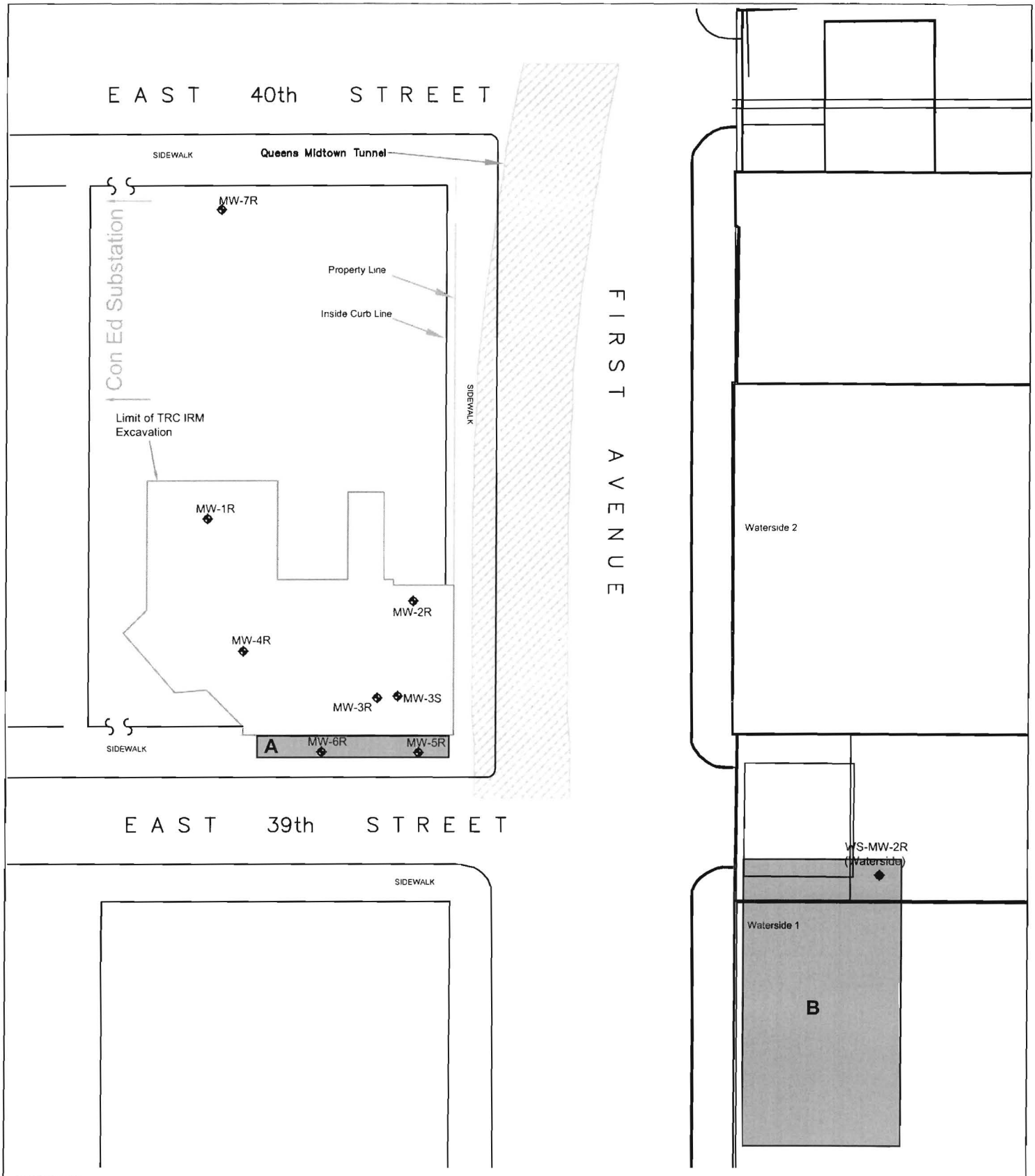
N

TRC

Parking Lot Property
685 First Avenue
New York, New York

Figure 1: Site Location Map
Approximate Scale 1: 24,000

Source: USGS Topographical Survey Maps
Central Park NY – NJ Quadrangle, Photorevised 1979
Brooklyn, NY, Photorevised 1979



NOTES

- MW-1R — Existing Monitoring Well
- WS-MW-2R (Waterside) — Existing NYSDEC - Approved Downgradient Monitoring Well
- A — Potential offsite location for future ORC injection points and downgradient monitoring wells, if required.
- B — Alternate potential offsite location for future downgradient monitoring wells, if required.

0 10 20 30 60 Feet

Graphic Scale

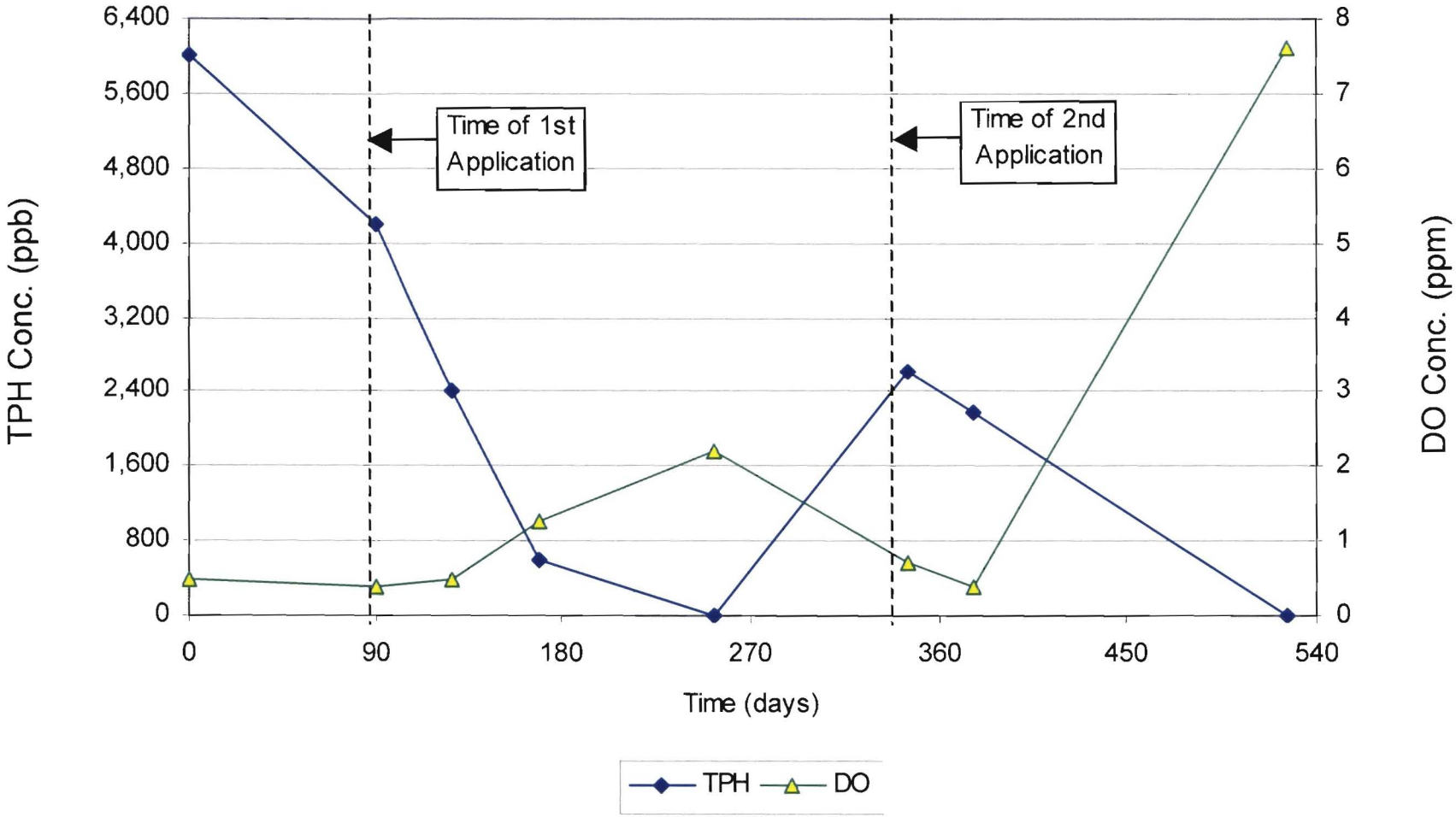
N

\\Lyndhrst_bd1\shared\First Avenue Files\Parking Lot\OM&M Plan\Figures\Figure 2 Well Location Map.dwg

Parking Lot Property
685 First Avenue
New York, New York

TRC TRC ENVIRONMENTAL CORPORATION 1200 Wall Street West Lyndhurst, New Jersey 07071	Designed by: M. Skirka	Date: 6/23/04
	Drawn by: MDB	Scale: As Shown
FIGURE 2	File Name: Figure 3 dwg	Project Number: 28410-PLO5-2430T

Drawing Title
Groundwater Monitoring Well Location Map and Potential Offsite Locations for Downgradient Monitoring Wells



Note: Hypothetical trends in Dissolved Oxygen (DO) and Total Petroleum Hydrocarbon (TPH) concentrations used for illustrative purposes only.

Parking Lot Property
685 First Avenue
New York, New York

TRC TRC ENVIRONMENTAL CORPORATION 1200 Wall Street West Lyndhurst, New Jersey 07071	Designed by: M. Skirka	Date: 6/26/02
	Drawn by: L. Wasiowich	Scale: None
FIGURE 3	File Name: Figure 3.dwg	Project Number: 28410-OMOT-9100T

Drawing Title: **Criteria for Additional Application of ORC**

\\Lyndhrst_bd1\shared\First Avenue Files\Parking Lot\OM&M Plan\Figures\Figure 3 Criteria for Reapplication of ORC.dwg

Tables

Table 1
First Avenue Properties
39th Street Parking Lot
Quarterly Groundwater Monitoring

	MW1R	MW2R	MW3R	MW3S	MW4R	MW5R	MW6R	MW7R	WS-MW-2R*
Sample Date									
Sample Time									
Chemets Kit (K-7512) Dissolved Oxygen 1- 12 mg/l range									
Chemets Kit (K-6502) Dissolved Manganese 0-2 ppm range									
Chemets Kit (K-6502D) Dissolved Manganese 0-50 ppm range									
Chemets Kit (K-6010) Soluble Iron 0-10 ppm range									
Chemets Kit (K-6010) Total Iron 0-10 ppm range									
Chemets Kit (K-6010C) Soluble Iron 0-10,000 ppm range									
Chemets Kit (K-6010C) Total Iron 0-10,000 ppm range									

Notes
Chemets Kit test were run during sample collection from disposable teflon bailers
All non-Chemets parameters were collected using a Horiba U-10 water quality meter
* WS-MW-2R is the NYSDEC-approved downgradient monitoring well on East 39th Street in the Waterside Generating Station

Table 2
First Avenue Properties
39th Street Parking Lot
Quarterly Groundwater Monitoring

Well	Date	Time	Gallons Purged	pH	Conductivity (mS/cm)	Salinity (%)	Turbidity (NTUs)	Temperature °C	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	PID (ppm)
MW1R											
MW2R											
MW3R											
MW3S											
MW4R											
MW5R											
MW6R											
MW7R											
MW8R											

Notes
Parameters were collected using a Horiba U-10 and/or WTW Multi 340i water quality meter
Turbidity collected using H.F. Sci Model DRT-15CE Turbidity Meter.

APPENDIX A

Material Safety Data Sheet for ORC®

OXYGEN RELEASE COMPOUND (ORC®)
MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised : December 6, 1999

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SECTION 1 - MATERIAL IDENTIFICATION

****

SUPPLIER:

REGENESIS

1011 Calle Sombra
San Clemente, CA 92673
949-366-8000 phone
949-366-8090 fax
orc@regenesis.com e-mail

CHEMICAL DESCRIPTION:
A mixture of Magnesium Peroxide [MgO2], Magnesium Oxide [MgO], and Magnesium Hydroxide [Mg(OH)2]

CHEMICAL FAMILY:
Inorganic Chemicals

PRODUCT NAME:
Oxygen Release Compound (ORC®)

PRODUCT USE:
Used for environmental remediation of contaminated soil and groundwater

****

SECTION 2 - CHEMICAL IDENTIFICATION

****

CHEMICAL CHARACTERIZATION
Magnesium Peroxide [MgO2]: CAS Reg. No. 14452-57-4
Magnesium Oxide [MgO]: CAS Reg. No. 1309-48-4
Magnesium Hydroxide ((Mg(OH)2): CAS Reg. No. 1309-42-8

FORM : powder

COLOR: white

ODOR: odorless

ASSAY: 25 - 35% Magnesium Peroxide (MgO_2)

****

SECTION 3 - PHYSICAL AND TECHNICAL SAFETY DATA

****

MELTING POINT: Not Determined

BOILING POINT: Not Determined

DENSITY: .6 - .8 g/cc

BULK DENSITY: ---

VAPOR PRESSURE: Data not available

VISCOSITY: ---

SOLUBILITY: Reacts with water. Soluble in acid

pH VALUE: Approx. 10 in saturated solution

FLASH POINT: Not applicable

SELF-IGNITION TEMPERATURE: Not applicable

EXPLOSION LIMITS % BY VOLUME: ---

THERMAL DECOMPOSITION: Spontaneous decomposition possible about 150° C

HAZARDOUS DECOMPOSITION PRODUCTS: Not known

HAZARDOUS REACTIONS: Hazardous polymerization will not occur

FURTHER INFORMATION: Non-combustible, but will support combustion

****

SECTION 4 - REACTIVITY DATA

****

STABILITY: Product is stable unless heated above 150°C. Magnesium Peroxide reacts with water to slowly release oxygen. React by product is magnesium hydroxide

CONDITIONS TO AVOID: Heat above 150°C. Open flames

INCOMPATIBILITY: Strong Acids. Strong chemical agents

HAZARDOUS POLYMERIZATION: None known

****

SECTION 5 - REGULATIONS

****

PERMISSIBLE EXPOSURE LIMITS IN AIR: Not established. Should be treated as a nuisance dust.

****

SECTION 6 - PROTECTIVE MEASURES, STORAGE, AND HANDLING

****

TECHNICAL PROTECTIVE MEASURES

STORAGE: Keep container tightly closed. Keep away from combustible material

HANDLING: Use only in well-ventilated areas

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Recommended (HEPA Filters)

HAND PROTECTION: Wear suitable gloves

EYE PROTECTION: Use chemical safety goggles

OTHER: ---

INDUSTRIAL HYGIENE: Avoid contact with skin and eyes

PROTECTION AGAINST FIRE AND EXPLOSION: ---

DISPOSAL: Dispose via sanitary landfill per state/local authority

FURTHER INFORMATION: Not flammable, but may intensify fire

****

SECTION 7 - MEASURES IN CASE OF ACCIDENTS AND FIRE

****

AFTER SPILLAGE/LEAKAGE/GAS LEAKAGE: Collect in suitable containers. Wash remainder with copious quantities of water.

EXTINGUISHING MEDIA

SUITABLE: Carbon dioxide, dry chemicals, foam

NOT TO BE USED: ---

FURTHER INFORMATION: Self contained breathing apparatus or approved gas mask should be worn due to small particle size. Use extinguishing media appropriate for surrounding fire.

FIRST AID: After contact with skin, wash immediately with plenty of water and soap. In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.

FURTHER INFORMATION: ---

SECTION 8 - INFORMATION ON TOXICOLOGY

TOXICITY DATA: Data not available

SECTION 9 - INFORMATION ON ECOLOGY

WATER POLLUTION HAZARD RATING (WGK): 0

SECTION 10 - FURTHER INFORMATION

After the reaction of magnesium peroxide to form oxygen the resulting material, magnesium hydroxide is mildly basic. The amounts of magnesium oxide (magnesia) and magnesium hydroxide in the initial product have an effect similar to lime, but with lower alkalinity.
The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information becomes available.

APPENDIX B

NYSDEC Letter dated June 22, 2004

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, 11th Floor
625 Broadway, Albany, New York 12233-7015
Phone: (518) 402-9622 • **FAX:** (518) 402-9022
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

June 22, 2004

Mr. Michael Skirka
TRC Environmental Corporation
1200 Wall Street West, 2nd Floor
Lyndhurst, New Jersey 07071

RE: Voluntary Cleanup Project
First Avenue Properties VCP Sites
Parking Lot, 685 First Avenue, ID # V00429-2
Final Report and OM&M Work Plan

Dear Mr. Skirka:

In response to TRC's June 16, 2004 request, the New York State Department of Environmental Conservation (NYSDEC) is writing this letter to clarify its April 2, 2004 letter for the Parking Lot Site at 685 First Avenue as it relates to future development. Our April 2nd letter states the following:

> "if development occurs before NYSDEC-required OM&M activities are completed, prior to commencement of development activities at the site and the abandonment of onsite wells, the Volunteer must submit a proposal for the placement of alternate locations for off-site injection and monitoring wells, if such wells are needed at that time, to continue groundwater remedial efforts."

To further clarify the above, in the event that site development commences prior to the cessation of OM&M activities at the site, additional offsite monitoring and injection wells would be installed. Accordingly, we suggest that, as part of its final OM&M revisions to address NYSDEC's April 2nd comments, TRC include in the revised OM&M Plan the general locations for placement of alternate off-site monitoring and injection wells, if such wells are ultimately needed. NYSDEC recommends that offsite injection wells/Geoprobe points be located between current offsite wells MW-5R and MW-6R just south of the property line in the 39th Street sidewalk. Additional offsite monitoring wells, if required, will be installed between MW-5R and MW-6R and on the Waterside property on the east side of First Avenue. No other feasible monitoring/injection locations exist downgradient of the groundwater plume area due to infrastructure constraints. If development is scheduled to begin before NYSDEC-required OM&M activities are completed, TRC can then abandon all on-site wells and place the off-site wells in the general locations identified in the approved OM&M Plan. The abandonment of existing onsite wells and installation of the new wells can then be completed without the need for any further OM&M Work Plan revisions. NYSDEC would simply require letter notification that the development is going to commence, that the onsite wells will be abandoned and that the injection/monitoring wells will be installed off-site in the general locations specified in the approved OM&M Plan. In that way, on site development can proceed prior to or concurrent with the installation of the off-site replacement wells.

I hope this letter provides the clarification that all parties require. If you have any further concerns, please do not hesitate to call me at (518) 402-9768.

Sincerely,

Thomas Gibbons
Project Manager
Remedial Bureau B, Section D
Division of Environmental Remediation

cc: R. Cozzy/File
T. Gibbons
K. Anders (DOH)

ec: P. D. Smith
D. D'Ambrosio (DEE, Tarrytown)
G. Laccetti/K. Anders (DOH)
J. O'Connell (Reg. 2)

New York State Department of Environmental Conservation
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Erin M. Crotty
Commissioner

April 2, 2004

Mr. Michael Skirka
TRC Environmental Corporation
1200 Wall Street West, 2nd Floor
Lyndhurst, New Jersey 07071

RE: Voluntary Cleanup Project
First Avenue Properties VCP Sites
Parking Lot, 685 First Avenue, ID # V00429-2
Final Report and OM&M Work Plan

Dear Mr. Skirka:

The New York State Department of Environmental Conservation (NYSDEC), along with the New York State Department of Health (NYSDOH), have completed its review of the Final Report for Parking Lot Remediation Work Plan (October 2003), the report's addendum entitled Parking Lot Soil Vapor Sampling Results (January 30, 2004; email), and the Operations, Maintenance and Monitoring (OM+M) Work Plan (October 2003) for the above-referenced site. The State finds these documents acceptable with the following provisions:

Final Report for Parking Lot Remediation Work Plan

The report states that a deed restriction will be required, providing that any groundwater removed from the site must be properly treated if removed and may be subject to use restrictions.

Final Report for Parking Lot Remediation Work Plan and Operations, Maintenance and Monitoring (OM+M) Work Plan

In order to manage groundwater at the site during ongoing monitoring well sampling and future development activities, please modify Section 4.2, Page 4-2 of the Final Report and Section 3.2, Page 3-3 of the OM+M Plan to state: A deed restriction will be imposed, to provide that any groundwater must be properly treated for disposal, if removed from the site, and groundwater may be subject to use restrictions.

Revise each report to indicate that: Monitoring wells will not be used as injection wells for ORC application; Monitoring wells may be used for the passive application of ORC thru diffusion socks, and that the ORC socks will be removed from the monitoring wells at least one week prior to sampling. Further revise the reports to indicate 1) that future development of the site may require the abandonment of existing groundwater monitoring wells and the loss of access for ORC injection via separate Geoprobe injection points, and 2) that if development occurs before NYSDEC-required OM+M

activities are completed, prior to commencement of development activities at the site and the abandonment of on-site wells, the Volunteer must submit a proposal for the placement of alternate locations for off-site injection and monitoring wells, if such wells are needed at that time to continue groundwater remedial efforts.

Revise Section 5.0 of the OM+M Plan to state that operations, maintenance and monitoring activities must continue until the State determines that the remedial goals for the site, as presented in the Interim Remedial Measures (IRM) Work Plans and Parking Lot Remediation Work Plan (December 2002) and Section 1.2 of the OM+M Plan, have been achieved.

If you have any question, don't hesitate to call me at (518) 402-9768.

Sincerely,

Thomas Gibbons
Project Manager
Remedial Bureau B, Section D
Division of Environmental Remediation

cc: R. Cozzy/File
T. Gibbons
K. Anders (DOH)

ec: P. D. Smith
M. Lesser
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