John V. Soderberg P.E
P.O BOX 263
Stony Brook, NY 11790

September 12, 2014

Ms. Jamie Verrigni
New York State Department of Environmental Conservation
Division of Environmental Remediation (DER)
625 Broadway, 11th Floor
Albany, New York 12233

Re: **Rose Cleaners** **Supplemental Phase II IRM WP**
500 Lexington Avenue Voluntary Cleanup and Remediation
Mt. Kisco, New York

Introduction

This Supplemental Injection Work Plan (SIWP) has been developed to address the Departments comments issued in their letter dated June 12, 2014 with regard to the submission of the draft Phase II IRM CCR dated April 2014. This work plan specifically addresses comment one (1) which discusses the need for additional treatment in the three (3) target areas throughout the property and comment ten (10) which discusses the need to decommission two (2) on-site monitoring wells. Please refer to Figures-1 and 2 for the site location and site details.

Remedial History

The initial Phase II IRMWP (September 2012) was implemented during June 2013 in order to address chlorinated solvent impacts (PCE and daughter breakdown products) to soil and groundwater at three (3) target locations throughout the property including: the excavation area (main source area), the dumpster area and the rear of the building. Due to its ready availability, ease of use, mixing with water to reduce worker exposure, relatively low cost, effectiveness, and overall safety, the use of RegenOx™ was the selected remedy. RegenOx™ can be added to excavations, and soil piles using soil blending equipment or injected through permanent or temporary well screens. Once in contact with contaminated soil, RegenOx™ produces an effective oxidation reaction, comparable to that of Fenton's Reagent, without a violent exothermic hazard. The most aggressive approach using chemical oxidation is to maximize contact between RegenOx™ and the contaminated soil and groundwater.

RegenOx™ is a proprietary, in-situ chemical oxidation process using a solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel). RegenOx™ with its catalytic system has very high activity, capable of treating a very broad range of soil and groundwater contaminants including both petroleum hydrocarbons and chlorinated solvents. Additionally, RegenOx™ has significant longevity

in the subsurface allowing for both the initial contaminant degradation and the continued treatment of contaminants desorbing from the matrix. Most importantly, RegenOx™, when handled appropriately, is safe and easy to apply to the contaminated subsurface without the health and safety concerns and lingering environmental issues that have become associated with other chemical oxidation technologies.

During June of 2013 RegenOx was applied through multiple injection wells (IW-1-8) in the dumpster area, rear of the building area and the h-pattern unit area installed within the former excavation. (Figure-3 well locations) A draft Phase II IRMCCR dated April 2014 was issued to the Department in order to document the results of the Phase II chemical injections. Based upon post sampling results documented in the draft Phase II IRMCCR the need for additional injections was recommended as per the Departments comment letter dated June 12, 2014. The following work plan proposes supplemental RegenOx injections in the three (3) target areas discussed above. All supplemental injections performed as part of this work plan will be documented in the final Phase II IRM CCR and submitted to the Department.

Scope of Work

This work plan has been developed to address the need for additional treatment within the three (3) target areas at the subject property and will adhere to the previously approved procedures discussed in the September 2012 Phase II IRMWP. Overall, the work plan will discuss the injection procedure, intended dosage quantities, remedial objectives, health and safety and compliance with State and Federal regulations. All proposed injections discussed within this work plan will comply with the Underground Injection Control (UIC) program as per the Environmental Protection Agency (EPA) protocol. A permit has been filed with the EPA and will be obtained prior to the injection event.

RegenOx Injections

It is anticipated that 640 pounds of RegenOx™ (400 pounds of oxidant and 240 pounds of activator) will be required for treatment of the excavation area. The RegenOx will be mixed with water in a 5.00% solution, which is standard for most well injections where soil lithology exhibits silty sands. In this case the aquifers hydraulic characteristics dictate a 5.20% solution. The solution includes pre-mixing (1) 40 lb bucket of part B with 1.2 gallons of water and separately mixing part A (1) 40 lb bucket, in a separate container with ninety (90) gallons of water. Upon individually mixing the part A and B, the two mixtures are than combined to form one (1) solution. The solution will than be injected into the previously installed H-pattern units within the former excavation area. A majority of the total solution will be injected into the larger H-pattern unit (approximately 70%) with the remainder of the solution (30%) injected into the smaller H-pattern. Please refer to Figure-4 for the H-pattern unit construction and location.

In the dumpster area and at the rear of the building, RegenOx will be pumped into multiple, strategically placed wells, in order to enhance the area of influence. It is anticipated that 880 pounds

of RegenOx (440 pounds each of Part A (oxidant) and Part B (activator) will be required for each treatment event in the dumpster and rear of the building areas. In this case the aquifers hydraulic characteristics dictate a 5.00% solution. The solution includes pre-mixing (1) 40 lb bucket of part B with 1.2 gallons of water and separately mixing part A, in a separate container with ninety (90) gallons of water. Upon individually mixing the part A and B, the two mixtures are than combined to form one (1) solution and injected into the sub-surface. The total solution will be split 50/50 and applied equally to each area of concern. Once the total solution is equally divided, it will than be sub-divided into four (4) equal parts in order to apply the solution to each injection well for the specified area (IW-1-4 and IW-5-8). Please refer to Table-1 and Table-2 for RegenOx dosage calculations for each treatment area.

Post Injection Monitoring

Before, during and post use of the RegenOx™, existing down gradient monitoring wells, MW-A-MW-H, MW-I, MW-J, HP-1 and HP-2, (Figure-3) will be monitored for changes in temperature, pH, conductivity, ORP, DO and depth to water (DTW) to make certain the RegenOx™ reaction with any residual saturated soil impacts do not occur too quickly and that the RegenOx™ solution does not migrate significantly beyond the intended treatment area. In order to monitor these conditions, the following activities will be conducted:

1. Prior to use of the RegenOx™ solution, background pH, conductivity, ORP, D.O, temperature and DTW readings will be collected from the down gradient monitoring wells to establish a baseline for these readings. Wells will also be sampled pre-injection event in order to establish a VOC baseline.

2. In order to ensure that the reaction rate is not too fast, background temperature readings will be collected from the monitoring wells. If temperature increases of 5°C or more are observed over the background conditions, the application and mixing will be discontinued until the temperature returns to background or near background conditions.

In order to perform follow-up evaluation of the RegenOx™ injections, the following activities are proposed:

- The initial post application evaluation of DTW, pH, conductivity, ORP, D.O and temperature of the on-site monitoring wells will take place 24-hours after treatment;

- The secondary evaluation of DTW, pH, conductivity, ORP, D.O and temperature of the on-site monitoring wells will take place one week after the RegenOx™ application; and

- The third evaluation of DTW, pH, conductivity, ORP, D.O and temperature of the on-site monitoring wells will take place two weeks after the RegenOx™ application.

The following sampling procedure will follow injections:

- Follow-up sampling of the on-site monitoring wells. Groundwater samples from the monitoring wells will be collected six (6) weeks after the application of the RegenOx™ solution and three (3) months following the initial post-use sample round. Quarterly sampling of all on-site monitoring wells will follow the three (3) month post injection sampling event for which conditions at the site will be re-evaluated including the need for additional injections. Each sampling event will include analyzation of VOC's. A report of this evaluation will be submitted to the Department within 60 days of the receipt of validated data.

Health and Safety (HASP)

The HASP developed for the September 2012 Phase II IRMWP will be used for this work plan. Health and Material Safety data sheets are attached as Table-3.

Community Air Monitoring Plan (CAMP)

The CAMP developed for the September 2012 Phase II IRMWP will be followed for this Supplemental Injection Work Plan.

Permitting

Wells for injection of RegenOx™ in the area described as Mount Kisco, NY are considered Class V Injection Wells as per the Federal Underground Injection Control (UIC) Program which falls under the Federal Safe Drinking Water Act (SDWA) and are permitted by rule. JVS is aware of the permit process with the USEPA and has previously obtained the necessary documentation permitting JVS to perform Underground Injections at the Rose Cleaners' site. Let it be noted that the EPA has to be contacted and a permit has to be filed for each individual injection. JVS has been in contact with the USEPA and is working obtain the proper permit.

Monitoring Well Decommissioning

Monitoring wells HP-1 and HP-2 are proposed to be decommissioned in accordance with the DEC Guidance document CP-43: Groundwater Monitoring Well Decommissioning Policy. The portion of the well occupied by the screen shall be filled with clean sand, but will not extend beyond the top of the screen. The entire casing including the riser pipe and annular spaces between the casing shall be filled with a cement/bentonite grout. The cement/bentonite grout will not contain more than six (6) gallons of water per bag. The standard grout mixture will be used and include: one (1) 94 lb bag of Type 1 Portland cement, 3.9 pounds of powdered bentonite and 7.8 gallons of potable water. The placing of the grout will continue until it appears at the top of the casing. After the grout has consolidated, as confirmed by visual inspection, the top of the casing will be closed and sealed at the surface with cement.

Monitoring Well Installation

Upon completion of the decommissioning of monitoring wells HP-1 and HP-2, newly installed wells (HP-1R and HP-2R) will be installed at these locations in order monitor groundwater conditions in the former excavation area. The wells will be installed via the direct push method, using a track mounted Geoprobe (6610) to a depth of approximately seven (7') below the grade surface in order to ensure viability. Well construction will include five (5') of 2" PVC 0.02" slot screen set into the water table. The remainder of the well will be finished to grade with 2", schedule 40 PVC riser pipe. Each well will be completed at grade with a flush mounted five (5") manhole cover. Please refer to Figure-3 for the well locations and Figures- 5a and 5b for the proposed well construction details.

Sincerely,

John V. Soderberg P.E
Professional Engineer

cc: Walter Berninger (BEI)
Justin Halpin (BEI)

DER-10 CERTIFICATION

I, John V. Soderberg, P.E., certify that I am currently a NYS registered professional engineer, and that this Work Plan was prepared in accordance applicable statutes and regulations and with substantial conformance with the DER Technical Guidance for Site Investigation and remediation (DER-10).

John Soderberg P.E

Seal:

Signature: _____

License number: 049975

Date: September 12, 2014

FIGURES

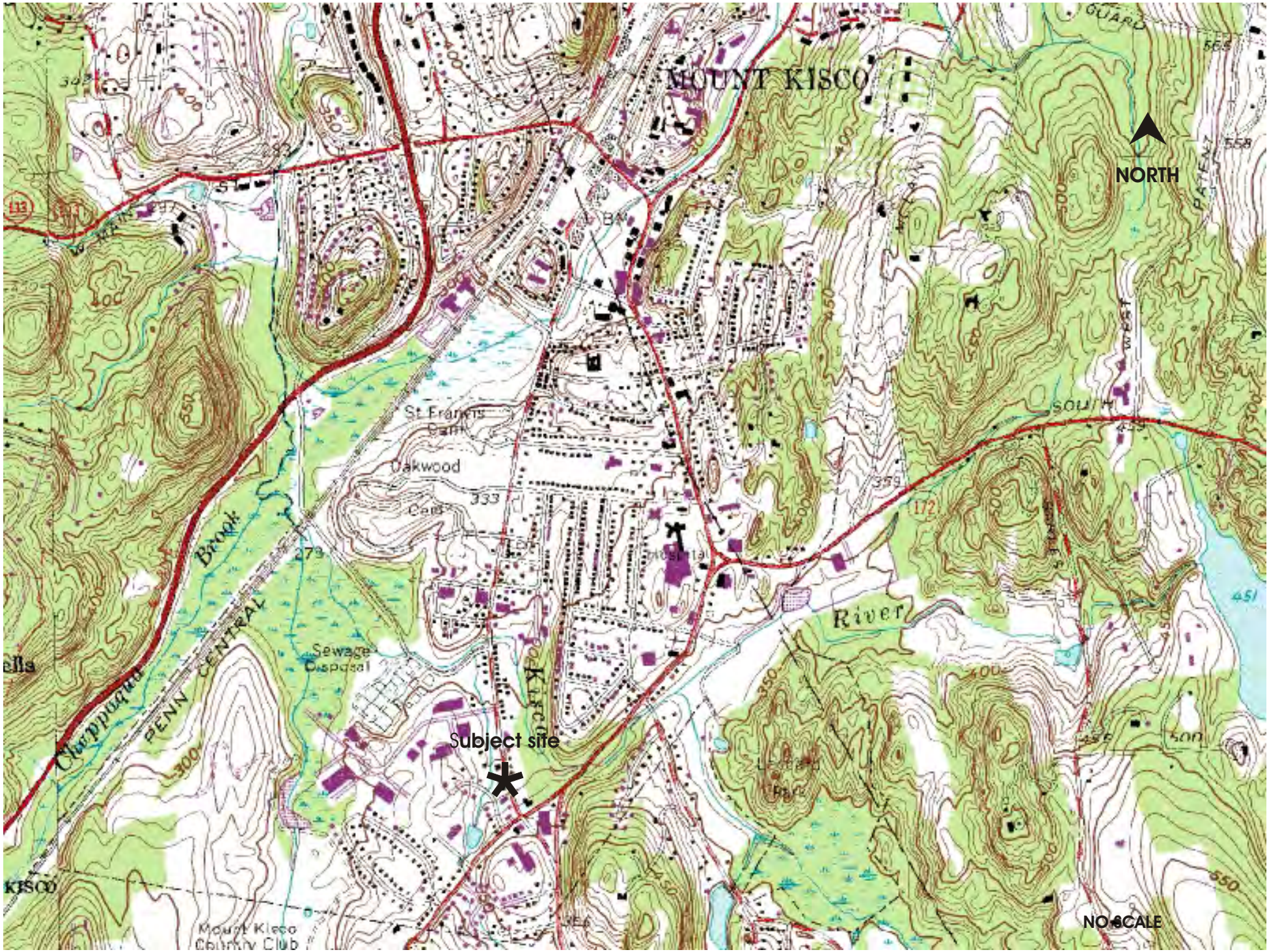
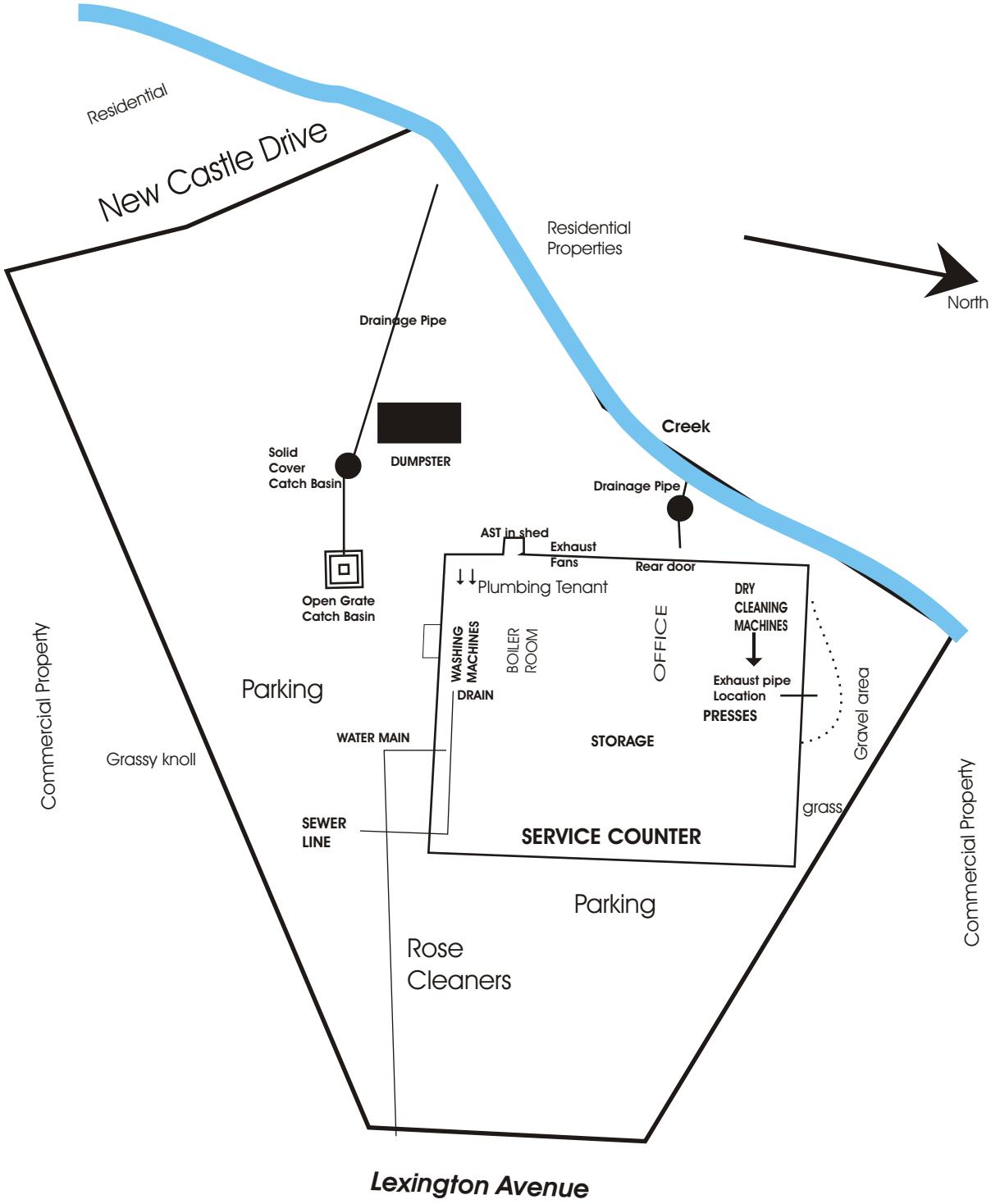


FIGURE 1 - SITE LOCATION AND TOPOGRAPHY



Based on plot plan

Approx. Scale 1" = 35 ft

FIGURE 2- Site Plan of Rose Cleaners with Details

Rose Cleaners
500 Lexington Avenue
Mt. Kisco, New York

John V. Soderberg
PO Box 263
Stony Brook, NY 11790

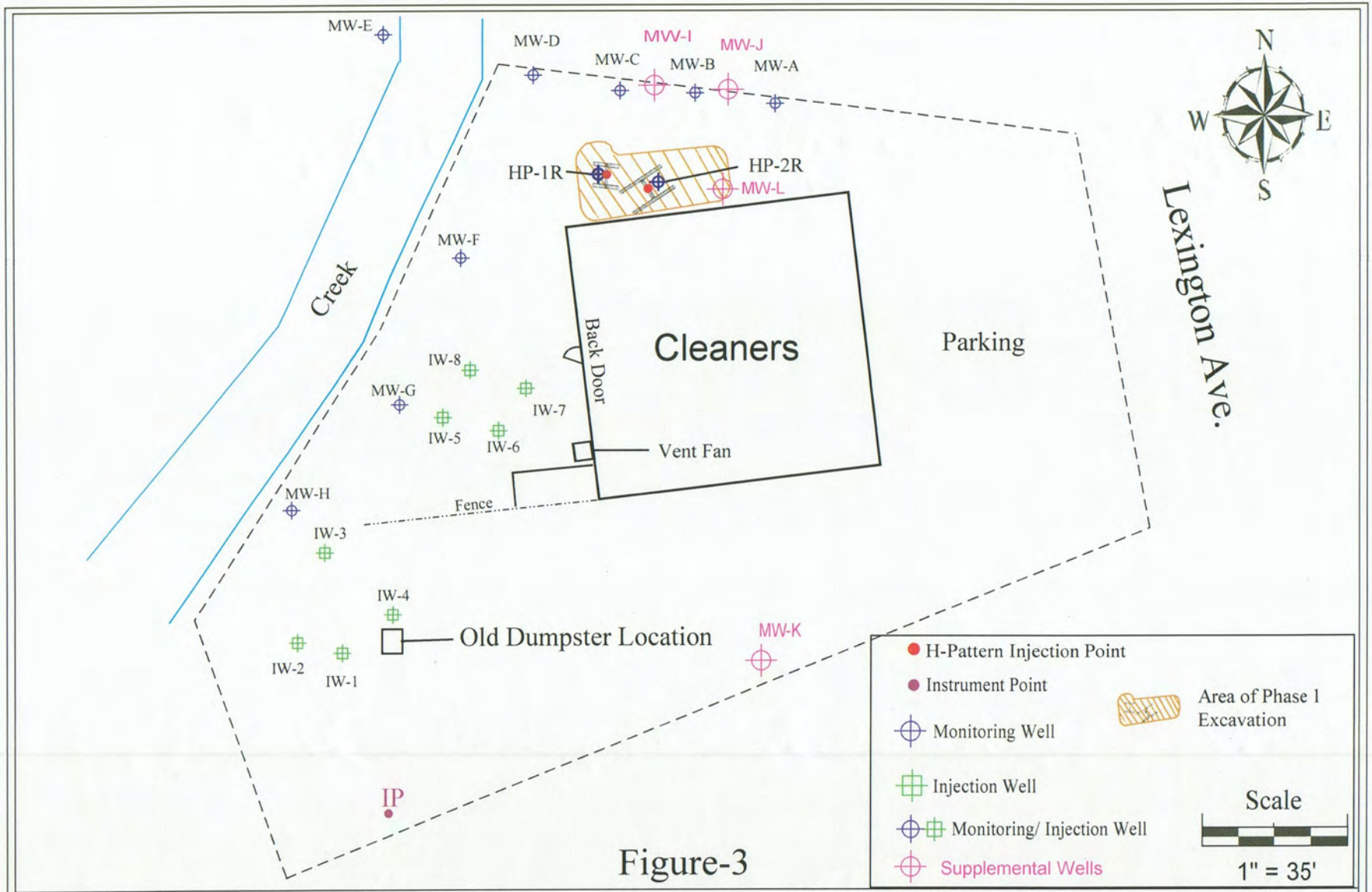
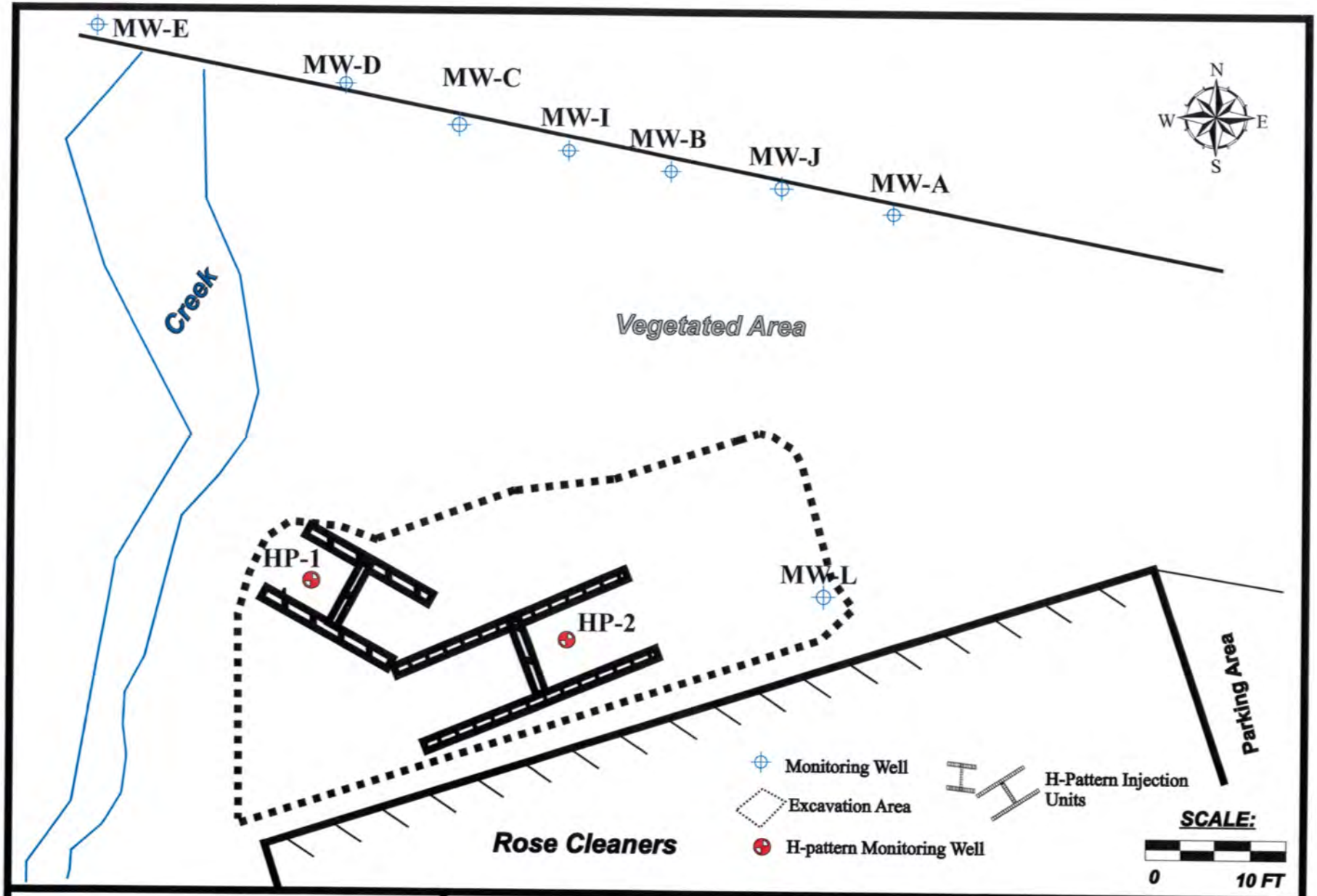


Figure-3

Well Location Map	Rose Cleaners 500 Lexington Ave. Mt. Kisco, NY	John V. Soderberg, PE, Esq. PO Box 263 Stony Brook, NY 11790



Rose Cleaners 500 Lexington Ave. Mt. Kisco, NY	**Figure 4- H-pattern Design Location**	John V. Soderberg PO Box 263 Stony Brook, NY 11790

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Stony Brook, NY 11790

Drawn By: JGH

Figure 5a

Well Log

Project: Rose Cleaners
Client: Leonard Rose
Location: Mt. Kisco, NY
Well No: HP-1R **Use:** Monitoring Well
Drilling Method: Geoprobe direct push
Casing Type: PVC **Casing Dia:** 2" **Casing Length:** 2'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 5'
Screen Slot: .02 inch **Gravel Pack:** #2 Fil-pro
Casing Seal: N/A **Finish:** above grade

Date: TBD
Be Job No:
Driller: TBD
Bore Hole Dia: 3.25"
Sample Method: N/A
Depth to Water: 4'
Total Depth: 7'
Security: N/A

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
Grade Surface			
			5" manhole cover flush mounted
2'			2' of 2" sched. 40 PVC riser pipe
4'		5' of .02 inch slot screen	
6'		Fil-Pro Gravel Pack Material	
			7' Depth to Bottom
8'			
10'			

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Stony Brook, NY 11790

Drawn By: JGH

Figure 5b

Well Log

Project: Rose Cleaners
Client: Leonard Rose
Location: Mt. Kisco, NY
Well No: HP-2R **Use:** Monitoring Well
Drilling Method: Geoprobe direct push
Casing Type: PVC **Casing Dia:** 2" **Casing Length:** 2'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 5'
Screen Slot: .02 inch **Gravel Pack:** #2 Fil-pro
Casing Seal: N/A **Finish:** above grade

Date: TBD
Be Job No:
Driller: TBD
Bore Hole Dia: 3.25"
Sample Method: N/A
Depth to Water: 4'
Total Depth: 7'
Security: N/A

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
Grade Surface			
			5" manhole cover flush mounted
2'			2' of 2" sched. 40 PVC riser pipe
4'			5' of .02 inch slot screen
6'			Fil-Pro Gravel Pack Material
			7' Depth to Bottom
8'			
10'			

TABLES

Table-1

Rear Building/Dumpster Area RegenOx Calculations

REGENESIS

RegenOx

Design Summary Output

Regenesis Technical Support: USA (949) 366-8000

www.regenesis.com

Date:	9/9/2014
Site Name:	Rose Cleaners
Treatment Area Location:	Vadose and Saturated Soils
Consultant/Contact:	Justin Halpin (WRES)

RegenOx Grid-Based Design Specifications - Direct Push Application

Rose Cleaners

Vadose and Saturated Soils

Design Specifications	**Quantity**	**Units**
Number of Application Events	two to four	---
Application Frequency	2 weeks	---
Injection Point Spacing within row	15	ft on center
Injection Point Spacing between rows	15	ft on center
Number of Injection Points per Event	4	---
Total Injection Points (all applications)	4	---
Treatment Areal Extent	600	ft^2
Top of Treatment Interval	5	ft-bgs
Bottom of Treatment Interval	15	ft-bgs
Vertical Treatment Thickness	10	ft
Linear Footage to be Drilled	60	ft
Product Quantities	**Quantity**	**Units**
Total RegenOx (A&B all applications)	**880**	**lbs**
RegenOx Part A per Point	110	lbs
RegenOx Part A per Application	440	lbs
Total RegenOx Part A (all applications)	440	lbs
RegenOx Part B per Point	110	lbs
RegenOx Part B per Application	440	lbs
Total RegenOx Part B (all applications)	440	lbs
Total RegenOx Per Cubic Yard	10	lbs
Product Cost		
RegenOx Product Cost	**$2,200**	**not including tax/freight**
Field Mixing / Injection Ratios	**Value**	**Units**
% Solution	5.2%	% oxidant (Part A)
Mix Water Volume per Point	215	gallons
Mix Water Volume per Application	860	gallons
Total Mix Water Volume (All Applications)	3,440	gallons
RegenOx Injection Volume per Point	944	gallons
Total RegenOx Injection Volume (All Applications)	3,776	gallons
SITE DATA - INPUT PARAMETERS		
Hydraulic Parameters	**Value**	**Units**
Soil Type	silty sand	---
Fraction Organic Carbon (foc)	0.005	g/g
Porosity	0.2	cm^3/cm^3
Effective Porosity	0.2	cm^3/cm^3
Hydraulic Conductivity	10	ft/day
Hydraulic Gradient	0.005	ft/ft
Seepage Velocity	91.3	ft/yr

Table-2

Excavation Area RegenOx Calculations

REGENESIS

RegenOx

Design Summary Output

Regenesis Technical Support: USA (949) 366-8000

www.regenesis.com

Date:	9/9/2014
Site Name:	Rose Cleaners
Treatment Area Location:	Vadose and Saturated Soils
Consultant/Contact:	Justin Halpin (WRES)

RegenOx Grid-Based Design Specifications - Direct Push Application

Rose Cleaners

Vadose and Saturated Soils

Design Specifications	**Quantity**	**Units**
Number of Application Events	two to four	---
Application Frequency	2 weeks	---
Injection Point Spacing within row	10	ft on center
Injection Point Spacing between rows	10	ft on center
Number of Injection Points per Event	2	---
Total Injection Points (all applications)	8	---
Treatment Areal Extent	150	ft^2
Top of Treatment Interval	1	ft-bgs
Bottom of Treatment Interval	10	ft-bgs
Vertical Treatment Thickness	9	ft
Linear Footage to be Drilled	80	ft
Product Quantities	**Quantity**	**Units**
Total RegenOx (A&B all applications)	**640**	**lbs**
RegenOx Part A per Point	50	lbs
RegenOx Part A per Application	100	lbs
Total RegenOx Part A (all applications)	400	lbs
RegenOx Part B per Point	60	lbs
RegenOx Part B per Application	120	lbs
Total RegenOx Part B (all applications)	240	lbs
Total RegenOx Per Cubic Yard	11	lbs
Product Cost		
RegenOx Product Cost	**$1,600**	**not including tax/freight**
Field Mixing / Injection Ratios	**Value**	**Units**
% Solution	5%	% oxidant (Part A)
Mix Water Volume per Point	114	gallons
Mix Water Volume per Application	228	gallons
Total Mix Water Volume (All Applications)	911	gallons
RegenOx Injection Volume per Point	105	gallons
Total RegenOx Injection Volume (All Applications)	840	gallons

SITE DATA - INPUT PARAMETERS

Hydraulic Parameters	**Value**	**Units**
Soil Type	silty sand	---
Fraction Organic Carbon (foc)	0.003	g/g
Porosity	0.33	cm^3/cm^3
Effective Porosity	0.2	cm^3/cm^3
Hydraulic Conductivity	10	ft/day
Hydraulic Gradient	0.005	ft/ft
Seepage Velocity	91.3	ft/yr

Table-3

RegenOx MSDS

RegenOx® – Part A (Oxidizer Complex)

Material Safety Data Sheet (MSDS)

Last Revised: June 24, 2010

Section 1 – Supplier Information and Material Identification

Supplier:

1011 Calle Sombra
San Clemente, CA 92673
Telephone: 949.366.8000
Fax: 949.366.8090
E-mail: info@regenesis.com

Chemical Description:	A mixture of sodium percarbonate [$2Na_2CO_3 \cdot 3H_2O_2$], sodium carbonate [Na_2CO_3], sodium silicate and silica gel.
Chemical Family:	Inorganic Chemicals
Trade Name:	RegenOx® – Part A (Oxidizer Complex)
Product Use:	Used to remediate contaminated soil and groundwater (environmental applications)

Section 2 – Chemical Information/Other Designations

CAS No.	Chemical	Percentage
15630-89-4	Sodium Percarbonate	60 -100 %
5968-11-6	Sodium Carbonate Monohydrate	10 – 30 %
7699-11-6	Silicic Acid	< 1 %
63231-67-4	Silica Gel	< 1 %

Section 3 – Physical Data

Form:	Powder
Color:	White
Odor:	Odorless
Melting Point:	NA
Boiling Point:	NA

Section 3 – Physical Data (cont)

Flammability/Flash Point:	NA
Vapor Pressure:	NA
Bulk Density:	0.9 – 1.2 g/cm^3
Solubility:	Min 14.5g/100g water @ 20 ºC
Viscosity:	NA
pH (3% solution):	≈ 10.5
Decomposition Temperature:	Self-accelerating decomposition with oxygen release starts at 50 ºC.

Section 4 – Reactivity Data

Stability:	Stable under normal conditions
Conditions to Avoid/Incompatibility:	Acids, bases, salts of heavy metals, reducing agents, and flammable substances
Hazardous Decomposition Products:	Oxygen. Contamination with many substances will cause decomposition. The rate of decomposition increases with increasing temperature and may be very vigorous with rapid generation of oxygen and steam.

Section 5 – Regulations

TSCA Inventory Listed:	Yes
CERCLA Hazardous Substance (40 CFR Part 302)	
Listed Substance:	*No*
Unlisted Substance:	*Yes*
SARA, Title III, Sections 313 (40 CFR Part 372) – Toxic Chemical Release Reporting: Community Right-To-Know	
Extremely Hazardous Substance:	No
WHMIS Classification:	C, D2B
Canadian Domestic Substance List:	Appears

Section 6 – Protective Measures, Storage and Handling

Technical Protective Measures

Storage:	Oxidizer. Store in a cool, well ventilated area away from all sources of ignition and out of the direct sunlight. Store in a dry location away from heat and in temperatures less than 40 °C. Keep away from incompatible materials and keep lids tightly closed. Do not store in improperly labeled containers. Protect from moisture. Do not store near combustible materials. Keep containers well sealed. Store separately from reducing materials. Avoid contamination which may lead to decomposition.
Handling:	Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Do not swallow. Avoid breathing vapors, mists or dust. Do not eat, drink or smoke in the work area. Label containers and keep them tightly closed when not in use. Wash hands thoroughly after handling.

Personal Protective Equipment (PPE)

Engineering Controls:	General room ventilation is required if used indoors. Local exhaust ventilation, process enclosures or other engineering controls may be needed to maintain airborne levels below recommended exposure limits. Avoid creating dust or mists. Maintain adequate ventilation at all times. Do not use in confined areas. Keep levels below recommended exposure limits. To determine actual exposure limits, monitoring should be performed on a routine basis.
Respiratory Protection:	For many conditions, no respiratory protection is necessary; however, in dusty or unknown conditions or when exposures exceed limit values a NIOSH approved respirator should be used.
Hand Protection:	Wear chemical resistant gloves (neoprene, rubber, or PVC).

Section 6 – Protective Measures, Storage and Handling (cont)

Eye Protection:	Wear chemical safety goggles. A full face shield may be worn in lieu of safety goggles.
Skin Protection:	Try to avoid skin contact with this product. Chemical resistant gloves (neoprene, PVC or rubber) and protective clothing should be worn during use.
Other:	Eye wash station.
Protection Against Fire & Explosion:	Product is non-explosive. In case of fire, evacuate all non-essential personnel, wear protective clothing and a self-contained breathing apparatus, stay upwind of fire, and use water to spray cool fire-exposed containers.

Section 7 – Hazards Identification

Potential Health Effects

Inhalation:	Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath, and irritations to mucous membranes, nose and throat.
Eye Contact:	Causes irritation, redness and pain.
Skin Contact:	Causes slight irritation.
Ingestion:	May be harmful if swallowed (vomiting and diarrhea).

Section 8 – Measures in Case of Accidents and Fire

After Spillage/Leakage:	Eliminate all ignition sources. Evacuate unprotected personnel and never exceed any occupational exposure limit. Shovel or sweep spilt material into plastic bags or vented containers for disposal. Do not return spilled or contaminated material to the inventory.
Extinguishing Media:	Water

First Aid

Eye Contact:	Flush eyes with running water for at least 15 minutes with eyelids held open. Seek a specialist.
Inhalation:	Remove affected person to fresh air. Seek medical attention if the effects persist.
Ingestion:	If the individual is conscious and not convulsing, give two-four cups of water to dilute the chemical and seek medical attention immediately. **Do Not** induce vomiting.

Section 8 – Measures in Case of Accidents and Fire (cont)

Skin Contact:	Wash affected areas with soap and a mild detergent and large amounts of water.

Section 9 – Accidental Release Measures

Precautions:

Cleanup Methods:	Shovel or sweep spilt material into plastic bags or vented containers for disposal. Do not return spilled or contaminated material to the inventory.

Section 10 – Information on Toxicology

Toxicity Data

LD50 Oral (rat):	2,400 mg/kg
LD50 Dermal (rabbit):	Min 2,000 mg/kg
LD50 Inhalation (rat):	Min 4,580 mg/kg

Section 11 – Information on Ecology

Ecology Data

Ecotoxicological Information:	NA

Section 12 – Disposal Considerations

Waste Disposal Method

Waste Treatment:	Dispose of in an approved waste facility operated by an authorized contactor in compliance with local regulations.
Package (Pail) Treatment:	The empty and clean containers are to be recycled or disposed of in conformity with local regulations.

Section 13 – Shipping/Transport Information

D.O.T. Shipping Name:	Oxidizing Solid, N.O.S. [A mixture of sodium percarbonate [$2Na_2CO_3 \cdot 3H2O_2$], sodium carbonate [Na_2CO_3], sodium silicate and silica gel.]
UN Number:	1479
Hazard Class:	5.1
Labels:	5.1 (Oxidizer)
Packaging Group:	III

Section 14 – Other Information

HMIS® Rating	Health – 1 (slight)	Reactivity – 1 (slight)
	Flammability – 0 (none)	Lab PPE – goggles, gloves, and lab coat

HMIS® is a registered trademark of the National Painting and Coating Association.

Section 15 – Further Information

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 become available. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

RegenOx® – Part B (Activator Complex)

Material Safety Data Sheet (MSDS)

Last Revised: June 4, 2010

Section 1 – Supplier Information and Material Identification

Supplier:

REGENESIS
1011 Calle Sombra
San Clemente, CA 92673
Telephone: 949.366.8000
Fax: 949.366.8090
E-mail: info@regenesis.com

Chemical Description:	A mixture of sodium silicate solution, silica gel and ferrous sulfate
Chemical Family:	Inorganic Chemicals
Trade Name:	RegenOx® – Part B (Activator Complex)
Product Use:	Used for environmental remediation of contaminated soils and groundwater

Section 2 – Chemical Information/Other Designations

CAS No.	Chemical
1344-09-8	Silicic Acid, Sodium Salt, Sodium Silicate
63231-67-4	Silica Gel
7720-78-7	Ferrous Sulfate
7732-18-5	Water

Section 3 – Physical Data

Form:	Liquid
Color:	Blue/Green
Odor:	Odorless
Melting Point:	NA
Boiling Point:	NA
Flammability/Flash Point:	NA
Vapor Pressure:	NA

Section 3 – Physical Data (cont)	
Specific Gravity	1.39 g/cm^3
Solubility:	Miscible
Viscosity:	NA
pH (3% solution):	11
Hazardous Decomposition Products:	Oxides of carbon and silicon may be formed when heated to decomposition.

Section 4 – Reactivity Data	
Stability:	Stable under normal conditions.
Conditions to Avoid:	None.
Incompatibility:	Avoid hydrogen fluoride, fluorine, oxygen difluoride, chlorine trifluoride, strong acids, strong bases, oxidizers, aluminum, fiberglass, copper, brass, zinc, and galvanized containers.

Section 5 – Regulations	
TSCA Inventory Listed:	Yes
CERCLA Hazardous Substance (40 CFR Part 302)	
Listed Substance:	*No*
Unlisted Substance:	*Yes*
SARA, Title III, Sections 302/303 (40 CFR Part 355) – Emergency Planning and Notification	
Extremely Hazardous Substance:	No
SARA, Title III, Sections 311/312 (40 CFR Part 370) – Hazardous Chemical Reporting: Community Right-To-Know	
Hazard Category:	Acute
SARA, Title III, Sections 313 (40 CFR Part 372) – Toxic Chemical Release Reporting: Community Right-To-Know	
Extremely Hazardous Substance:	No

Section 6 – Protective Measures, Storage and Handling

Technical Protective Measures

Storage:	Keep in a tightly closed container (steel or plastic) and store in a cool, well ventilated area away from all incompatible materials (acids, reactive metals, and ammonium salts). Store in a dry location away from heat above 60 degrees C and colder than 10 degrees C. Do not store in aluminum, fiberglass, copper, brass, zinc or galvanized containers.
Handling:	Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. Use with adequate ventilation. Do not use product if it is brownish-yellow in color.

Personal Protective Equipment (PPE)

Engineering Controls:	General room ventilation is required if used indoors. Local exhaust ventilation, process enclosures or other engineering controls may be needed to maintain airborne levels below recommended exposure limits. Safety shower and eyewash station should be within direct access.
Respiratory Protection:	Use NIOSH-approved dust and mist respirator where spray mist exists. Respirators should be used in accordance with 29 CFR 1910.134.
Hand Protection:	Wear chemical resistant gloves.
Eye Protection:	Wear chemical safety goggles. A full face shield may be worn in lieu of safety goggles.
Skin Protection:	Try to avoid skin contact with this product. Gloves and protective clothing should be worn during use.
Other:	
Protection Against Fire & Explosion:	Product is non-explosive and non-combustible.

Section 7 – Hazards Identification

Potential Health Effects

Inhalation:	Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath, and irritations to mucous membranes, nose and throat.
Eye Contact:	Causes irritation, redness and pain.
Skin Contact:	Causes irritation. Symptoms include redness, itching and pain.
Ingestion:	May cause irritation to mouth, esophagus, and stomach.

Section 8 – Measures in Case of Accidents and Fire

After Spillage/Leakage (small):	Mop up and neutralize liquid, then discharge to sewer in accordance with local, state and federal regulations.
After Spillage/Leakage (large):	Keep unnecessary personnel away; isolate hazard area and do not allow entrance into the affected area. Do not touch or walk through spilled material. Stop leak if possible without risking injury. Prevent runoff from entering into storm sewers and ditches that lead to natural waterways. Isolate the material if at all possible. Sand or earth may be used to contain the spill. If containment is not possible, neutralize the contaminated area and flush with large quantities of water.
Extinguishing Media:	Material is compatible with all extinguishing media.
Further Information:	

First Aid

Eye Contact:	Flush eyes with running water for at least 15 minutes with eyelids held open. Seek a specialist.
Inhalation:	Remove affected person to fresh air. Give artificial respiration if individual is not breathing. If breathing is difficult, give oxygen. Seek medical attention if the effects persist.
Ingestion:	If the individual is conscious and not convulsing, give two-four cups of water to dilute the chemical and seek medical attention immediately. **DO NOT** induce vomiting.
Skin Contact:	Wash affected areas with soap and a mild detergent and large amounts of water. Remove contaminated clothing and shoes.

Section 9 – Accidental Release Measures

Precautions:

PPE:	Wear chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots (see Section 6).
Environmental Hazards:	Sinks and mixes with water. High pH of this material may be harmful to aquatic life. Only water will evaporate from a spill of this material.
Cleanup Methods:	Pick-up and place in an appropriate container for reclamation or disposal. US regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities.

Section 10 – Information on Toxicology

Toxicity Data

Sodium Silicate:	When tested for primary eye irritation potential according to OECD Guidelines, Section 405, a similar sodium silicate solution produced corneal, iridal and conjunctival irritation. Some eye irritation was still present 14 days after treatment, although the average primary irritation score has declined from 29.7 after 1 day to 4.0 after 14 days. When tested for primary skin irritation potential, a similar sodium silicate solution produced irritation with a primary irritation index of 3 to abraded skin and 0 to intact skin. Human experience confirms that irritation occurs when sodium silicates get on clothes at the collar, cuffs, or other areas where abrasion may exist. The acute oral toxicity of this product has not been tested.
Ferrous Sulfate:	LD50 Oral (rat): 319 mg/kg not a suspected carcinogen.

Section 11 – Information on Ecology

Ecology Data

Ecotoxicological Information:	Based on 100% solid sodium silicate, a 96 hour median tolerance for fish of 2,320 mg/l; a 96 hour median tolerance for water fleas of 247 mg/L; a 96 hour median tolerance for snail eggs of 632 mg/L; and a 96 hour median tolerance for Amphipoda of 160 mg/L.

Section 12 – Disposal Considerations

Waste Disposal Method

Waste Treatment:	Neutralize and landfill solids in an approved waste facility operated by an authorized contactor in compliance with local regulations.
Package (Pail) Treatment:	The empty and clean containers are to be recycled or disposed of in conformity with local regulations.

Section 13 – Shipping/Transport Information

D.O.T.	This product is not regulated as a hazardous material so there are no restrictions.

Section 14 – Other Information

HMIS® Rating	Health – 2 (moderate)	Reactivity – 0 (none)
	Flammability – 0 (none)	Lab PPE – goggles, gloves, and lab coat
	Contact – 1 (slight)	

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Section 15 – Further Information

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 become available. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.