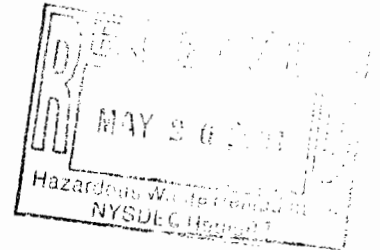


CA RICH CONSULTANTS, INC.
Phone: (516) 576-8844
Fax: (516) 576-0093

17 DUPONT STREET
PLAINVIEW, NEW YORK
11803

MEMORANDUM

To: Jamie Asher
From: Eric A. Weinstock
Date: May 17, 2004
Subject: IRM Work Plan
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York
cc: Sal Panico
Miriam Villani, Esq.



Attached is an IRM work plan to apply permanganate at the above-referenced site. With your approval, we would like to begin this work in late May or early June of this year.

Regards,

Eric



e-mail: eweinstock@carichinc.com
website: www.carichinc.com

**Interim Remedial Measures Work Plan
Operable Unit 2
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York**

May 2004

Prepared for:

**Sal Panico
Chief Operating Officer
Citizens Development Company
111-15 Queens Blvd.
P.O. Box 10
Forest Hills, NY 11375**

Prepared by:

**CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803**





May 17, 2004

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation – Region 1
SUNY - Building 40
Stony Brook, NY 11790

Attention: Jamie Ascher
Engineering Geologist 2

**Re: Interim Remedial Measures Work Plan
Operable Unit 2 - Site #1-30-070
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York**

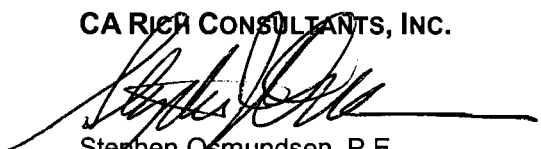
Dear Mr. Ascher:


Enclosed please find our Interim Remedial Measures Work Plan for the above-referenced Site. Upon your review, we would like to begin scheduling the field work. Please do not hesitate to call our office if you have any questions regarding this document.



Sincerely,

CA RICH CONSULTANTS, INC.


Stephen Osmundsen, P.E.
Senior Engineer


Eric A. Weinstock
Associate

Enclosure

cc: Miriam Villani, Esq.
Sal Panico
Rosalie Rusinko
Ian Ushe, NYSDOH

NT Server\Files\Users\Projects\CDC-FF\IRM\IRM WP Cover Letter

**Operable Unit 2 – Interim Remedial Measures Work Plan
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York
Site Number: 1-30-070**

1.0 INTRODUCTION

The following Interim Remedial Measures (IRM) Work Plan was prepared by CA RICH Consultants, Inc. (CA RICH) on behalf of The Citizens Development Company (CDC). Operable Unit 1 (OU-1) of this Site was addressed earlier and a Record of Decision (ROD) for OU-1 has been issued. The current phase of work is being addressed under Operable Unit 2 (OU-2). The purpose of this IRM Work Plan, is to access perchloroethene (a.k.a. PCE or tetrachloroethene) and its degradation products.

The Work Plan addresses the remediation of an area of the Upper Glacial Aquifer located in the central and northern portion of the property. The estimated thickness of the Upper Glacial Formation at this location is approximately 200 feet and the depth to the water table is approximately 50 feet.

A series of investigations were performed at this Site by CA RICH and previous consultants. A detailed summary of these previous investigations is described in the Remedial Investigation prepared for this site. The following is a partial list of these previous investigations.

<u>Investigation</u>	<u>Date</u>
Citizens Development Company Final Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (Ref. 1)	February 1998
Record of Decision, Citizens Development Company Work Plan Operable Unit 1, NYSDEC (Ref. 2)	March 1998
Citizens Development Company Remedial Investigation Work Plan Operable Unit 2, JR Kolmer + Assoc. (Ref. 3)	June 1999
Citizens Development Company Operable Unit 2 Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (Ref. 4)	December 2001
Citizens Development Company Supplemental Remedial Investigation Work Plan, JR Kolmer + Assoc. (Ref. 5)	June 2002
Groundwater Quality Data for the Flower Fashion Site, Civil & Environmental Consultants, Inc. (Ref. 6)	October 2002
Annual Report: Groundwater Sample Results The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (Ref. 7)	March 2003
Supplemental Investigation Work Plan The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA Rich (Ref. 8)	April 2003

Supplemental Investigation Summary Report
Operable Unit 2 - Site #1-30-070
The Citizens Development Company / Flower Fashion Site
47 Northern Blvd., Great Neck, New York, CA RICH (Ref. 9)

March 2004

2.0 BACKGROUND

The CDC/FF Site previously operated as a dry cleaner, a florist and is currently used as an AT&T Wireless Services store. During the 1980's and 1990's, a series of remediation activities including soil excavation, soil vapor extraction and groundwater pump and treat systems were employed at the CDC/FF Site to address the dry cleaning chemical perchloroethene and its degradation products. Historical plots of the concentration of PCE in the Site groundwater monitoring wells indicate that the levels have generally been decreasing with time. However one of the wells, MW-4, has displayed upward and downward fluctuations in PCE concentrations during recent sampling events (Ref. 9).

The reported detection of PCE during the 2003 annual sampling round (Ref. 7) in upgradient well "MW-1A" and at one of the Site wells "MW-3" is an indication that PCE is entering the property from an upgradient source. Several active and former dry cleaning facilities exist in close proximity to the CDC/FF Site and include Little Neck Cleaners, DryClean USA and Mayflower Cleaners. Additional detail regarding these facilities is included in Ref.8.

A soil vapor survey performed during the October 2003 Supplemental Investigation revealed elevated levels of PCE in the soil behind the AT&T store. The purpose of this IRM is to address the elevated levels of PCE in well MW-4 and in the soil gas detections behind the AT&T store

3.0 SUPPLEMENTAL INVESTIGATION SUMMARY

A Supplemental Investigation (Ref. 8) was performed to evaluate potential upgradient sources of PCE, investigate the potential for a residual source of PCE to exist at the CDC/FF Site, and to implement a program of post-remediation monitoring. This investigation included the following work items:

- Identify and evaluate other potential sources of PCE in the area;
- Inventory, sample and analyze area storm drain sediments for the presence of PCE;
- Perform a soil vapor survey on the CDC/FF Site to identify the existence of a residual source of PCE at the Site;
- Implement a program of post-remediation groundwater monitoring for the Site;
- Evaluate the capacity of the existing SVE blower; and
- Initiate a program of periodic indoor air sampling.

A summary of the Supplemental Investigation is presented below.

3.1 Potential Sources of PCE in the Area

Based upon the information obtained and reviewed, there appears to be evidence indicating that the presence of PCE in groundwater at the Site is partially related to an off-site source or sources. This has been confirmed by the reported detections of PCE in upgradient Site monitoring wells MW-1A, MW-1C and the Exxon gas station well EMW-1. There have also been low-level detections of PCE in the parking lot storm drains in the general area of the Site. In addition, other active or former dry cleaning operations have been identified in the area, some of which may have also contributed to the presence of PCE in the local groundwater and environment.

3.2 Parking Lot Storm Drains

Parking lot storm drains receive rainfall runoff that is discharged immediately to the subsurface soil eventually recharging the groundwater of the upper glacial aquifer. Soil sample data from nearby storm drains indicate the presence of trace levels of PCE. Although the reported concentrations are not indicative of a recent or on-going release of PCE to the environment, its presence in the shallow bottom sediment of some storm drains suggests a potential source that is not related to the CDC/FF Site since a dry cleaning operation at the CDC/FF Site hasn't been in operation for several years.

3.3 Soil Vapor Survey

The soil vapor survey sample results indicate the presence of PCE vapors in the soil beneath the and behind the CDC/FF Site building. The highest reported detection was 2,4000,000 ug/m³ at SVP-5 which is located outside and behind the north side of the building. All other reported concentrations were generally within the same order of magnitude and ranged from 2,000 ug/m³ to 110,000 ug/m³. The existing SVE system is currently exerting a slight vacuum and extracting the PCE vapors in the inside areas of the basement. The indoor air samples taken from the AT&T store indicate that this system is effective.

3.4 Post-Remediation Groundwater Monitoring

The NYSDEC-approved post-remediation groundwater monitoring program was initiated on December 17, 2003. The results from this round of groundwater samples indicate the presence of PCE in upgradient wells MW1-A at 53.6 ug/l and MW-1C at 52.0 ug/l. An elevated concentration of PCE, 544 ug/l, was observed in monitoring well MW-4, which has historically contained the highest detections of PCE.

3.5 Soil Vapor Extraction (SVE) System and Vacuum Pilot Test

The results of the soil vapor survey indicate that there is residual PCE in the present soil beneath the CDC/FF building and in the area of the former dry well behind the building. Currently, the existing Fantech™ low pressure SVE blower exhausts extracted soil vapor at a rate of approximately 150 cfm. Due to the extensive length of the perforated subsurface drain line which is connected to the existing system, it was determine during a vacuum pilot test that increasing the size of the SVE blower will not increase the subsurface vacuum or radius of influence of the present soil vapor extraction system. However, the current system appears to be effectively controlling the vapors and addressing the indoor air quality of the AT&T store.

3.6 Indoor Air Sampling

The indoor air sampling program commenced on December 2, 2003 and will continue to coincide with the scheduled groundwater sample dates (months of December and June) at the same locations. The reported concentrations of PCE at the designated sample locations did not exceed the indoor air quality "action" level for PCE generally used by NYSDOH of 100 ug/m³.

3.7 Investigation Summary

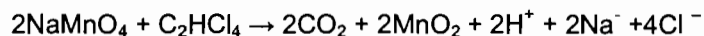
- There appears to be additional sources of PCE in the general area of the Site as observed in upgradient groundwater monitoring wells, on-site storm drain sediment samples and the results of the neighborhood survey. However, these sources do not appear to be solely responsible for the concentrations of PCE currently being observed in monitoring well MW-4.

- The results of the indoor air sampling for PCE did not identify the presence of PCE in the air at concentrations exceeding the New York State Department of Health action level of 100 ug/m³.
- The results of the soil gas survey indicate the presence of PCE in shallow soil gas at elevated levels beneath the basement foundation of the subject building and in the rear yard area. Specifically, the highest reported detection of PCE was observed in shallow soil gas collected from the outside area at the northwest corner of the Site ("SVP-5").
- The recent groundwater sampling results identified the presence of PCE in both upgradient and downgradient monitoring points on the Site. The highest reported concentration was observed at well MW-4 at a concentration of 544 ug/l. The deeper monitoring well MW-4D contained PCE at the lowest reported concentration of 1.8 ug/l. Based upon a recent groundwater elevation contour map, there appears to be a connection of elevated PCE concentrations in soil gas sample below area SVP-5 and monitoring well MW-4.

4.0 IRM DESIGN

The remnant PCE vapors detected below the rear of the Site and the continued detection of PCE in monitoring well MW-4 will be addressed through the performance of a focused Interim Remedial Measure (IRM). We have selected permanganate injection coupled with continued indoor air and groundwater monitoring as the remedial technology for this phase of the project.

Permanganate is a strong oxidizer that has a long history of application for the control of odors at wastewater treatment plants. The application of permanganate directly to subsurface soils and groundwater has been proven successful for the remediation of PCE. Once in contact with PCE, the permanganate converts the contaminant to harmless by-products as shown below:



(Permanganate + Perchloroethene → Carbon Dioxide Gas + Manganese Dioxide + Hydrogen ions + Sodium ions + Chlorine ions)

4.1 Pre-Installation Soil Boring and Analysis

One Geoprobe™ soil boring will be placed in the rear of the building with soil samples collected at selected depths for permanganate demand analysis. These samples will be forwarded to the Carcus Chemical Company for testing. Based on these test data, the amount of permanganate needed for this application will be determined.

4.2 Design of Permanganate Injection System

A total of 27 permanganate injection points will be installed at the locations shown on Figure 1 using a Geoprobe™ type probing rig. Each 4-foot long point will consist of 1-inch diameter, flush-threaded, schedule 40 PVC pipe. The pipe will have 0.030-inch slots (30 slot) along the bottom 3 feet and will be installed in the unsaturated soils below the rear yard of the property. A schematic diagram of a typical injection point is presented on Figure 2.

Monitoring well MW-4 will be equipped with a 3-3/4 inch diameter submersible pump capable of achieving approximately 10 gpm. A utility trench for electric power and a discharge line will be installed from the well head and leading over to an equipment shed placed in the back of the AT&T Store. The discharge line from the submersible pump will be connected to the top of a mixing tank located in the equipment shed. The 27 injection points will be connected to header lines in three groups of nine points per group. Each of the header lines will be connected to a

discharge port at the bottom of the tank such that the water pumped from well MW-4 can be used to fill the tank, prepare a permanganate solution and then discharge the solution into the groups of nine injection points.

Bulk sodium permanganate will be purchased in 55-gallon drums and at a concentration of 40% from the Carus Chemical Company. Using the mixing tank placed in the shed, 50-gallon doses of 5% sodium permanganate will be prepared by mixing 5 gallons of 40% sodium permanganate with 45 gallons of well water. The solution will be applied from the mixing tank to the groups of nine injection points at a rate of approximately 1.1 gpm per point and allowed to saturate the subsurface soils. This process will be performed three times per day (one for each group of nine points) such that all 27 points are treated. A schematic of the piping system is included as Figure 3.

After the permanganate solution from the mixing tank is applied to the injection points, valves in the equipment shed will be adjusted to allow the water pumped from well MW-4 to flow directly to the header lines of the injection points, by passing the mixing tank. Once the permanganate solution percolates downward and reaches the water table, it will flow with the underlying groundwater towards well MW-4. The pump in well MW-4 will capture the injected solution and discharge it to the header lines for re-circulation into the injection points, as illustrated on Figure 4.

Three doses of 50 gallons of permanganate per group of injection points will be applied to the system for a total of 150 gallons per day. This will continued for 5 consecutive days. The discharge from well MW-4 will be checked for residual permanganate on a daily basis using a colorimeter. The goal of the injection program will be to sustain a pinkish coloration in the discharge of well MW-4 and a permanganate concentration of approximately 10 ppm. Additional applications of permanganate will follow the first week as needed.

The concentration of PCE in the discharge from well MW-4 will also be monitored on a weekly basis using an ELAP approved laboratory and EPA methods 8021 or 8260. These results will be plotted over time to monitor the effectiveness of the program.

4.3 Termination Criteria

The applications will continue until a residual of permanganate is measured in the discharge from well MW-4. Additional applications may be applied to help reduce the possibility of a PCE rebound in the well after the process is completed.

Groundwater quality samples will be collected from well MW-4 on a weekly basis. The remediation goal for this well will be the drinking water standard for PCE, 5 ug/L. We understand that NYSDEC may choose an alternative termination criteria based on an evaluation of the time versus concentrations plots for this well.

The soil vapor probes installed as part of the Supplemental Investigation will be checked for VOCs including PCE on a quarterly basis to determine if the permanganate injection program has been effective in reducing the soil vapor concentrations. Should the soil vapor reading remain elevated, an alternative approach will be developed.

Once the permanganate application process is completed, the schedule for indoor air and groundwater sampling developed in the Supplemental Investigation Work Plan (Ref. 8) will resume.

5.0 REPORTING

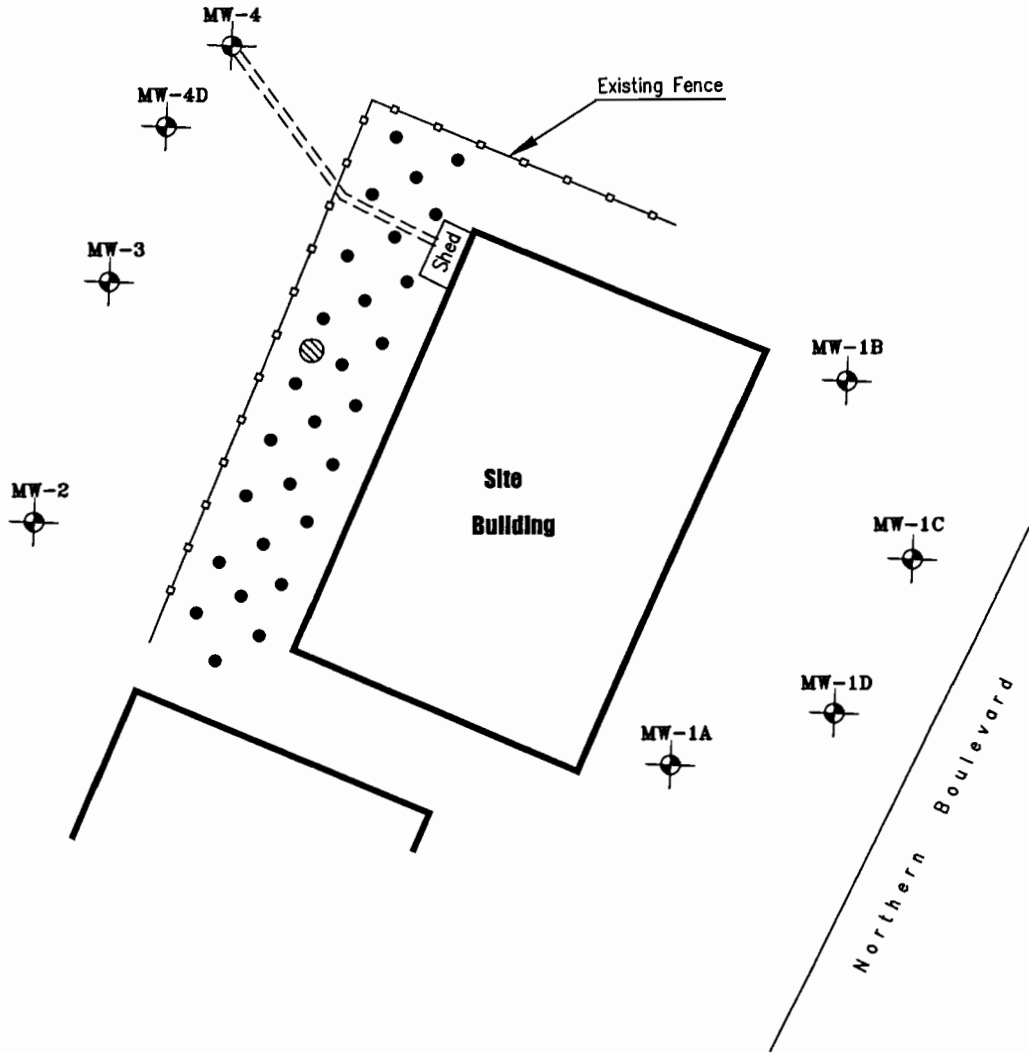
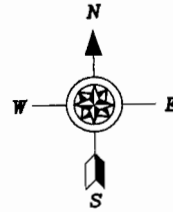
After the system has been installed and is in operation an IRM Report will be prepared that will include a Final Engineering Report, As-Built Drawings and an OM&M Plan. The IRM Report will be signed and sealed by a NYS Professional Engineer.

6.0 SCHEDULE




<u>Work Item</u>	<u>Days After Work Plan Approval</u>
IRM Work Plan Submittal	
Pre-Installation boring and soil analysis	30
Installation of injection points, header lines, well pump, shed and mixing tank	60
Application of Permanganate	90
IRM Report	120

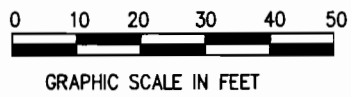
7.0 REFERENCES

1. Citizens Development Company Final Remedial Investigation / Feasibility Study Report, JR Kolmer + Assoc. (February 1998)
2. Record of Decision, Citizens Development Company Work Plan Operable Unit 1, NYSDEC (March 1998)
3. Citizens Development Company Remedial Investigation Work Plan Operable Unit 2, JR Kolmer + Assoc. (June 1999)
4. Citizens Development Company Operable Unit 2 Remedial Investigation/Feasibility Study Report, JR Kolmer + Assoc. (December 2001)
5. Citizens Development Company Supplemental Remedial Investigation Work Plan, JR Kolmer + Assoc. (June 2002)
6. Groundwater Quality Data for the Flower Fashion Site Civil & Environmental Consultants, Inc. (October 2002)
7. Annual Report: Groundwater Sample Results The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York, CA RICH (March 2003)
8. Supplemental Investigation Work Plan The Citizens Development Company / Flower Fashion Site 47 Northern Blvd., Great Neck, New York (April 2003)
9. Supplemental Investigation Summary Report Operable Unit 2 - Site #1-30-070 The Citizens Development Company / Flower Fashion Site, 47 Northern Blvd., Great Neck, New York, CA RICH (March 2004)



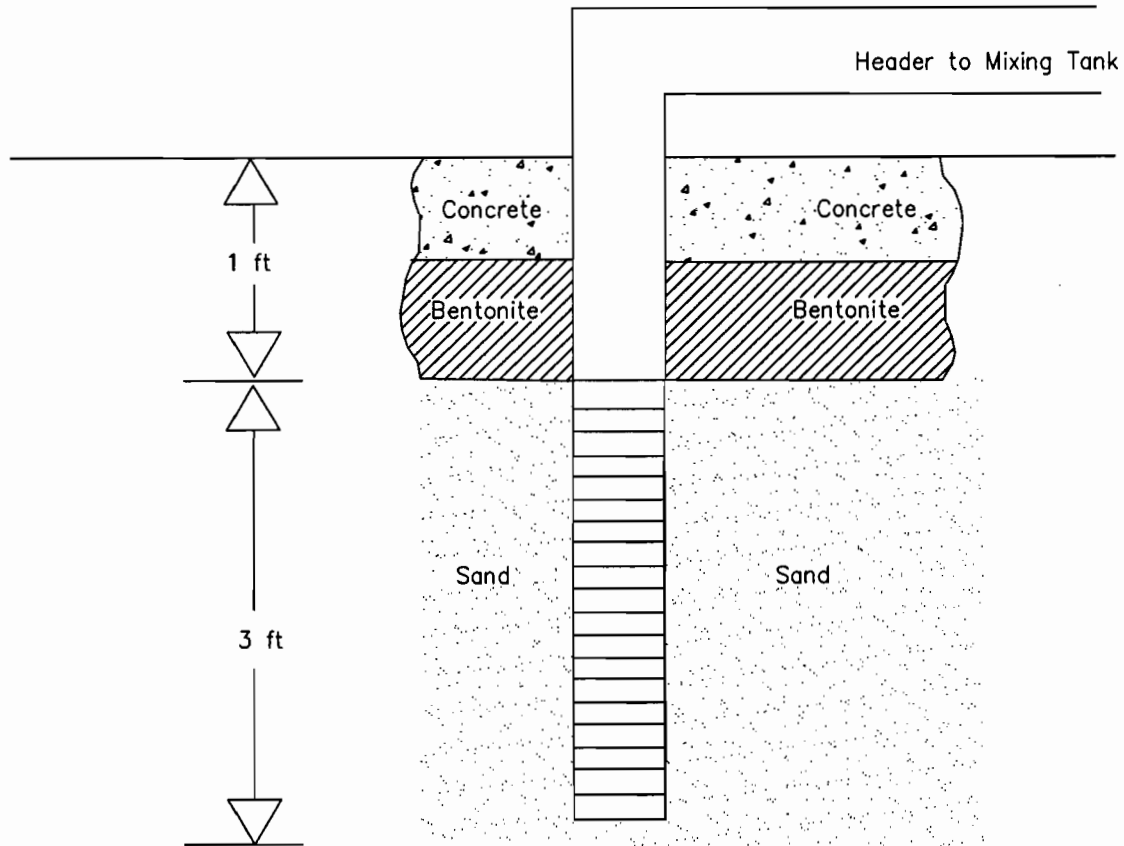
LEGEND

-  FORMER STORM WATER DRYWELL
-  GROUNDWATER MONITORING WELL
-  SODIUM PERMANGANATE INJECTION POINT



Note:
 Map adapted from Civil and Environmental Engineers, Inc.
 Site Area Map dated May 16, 2002.

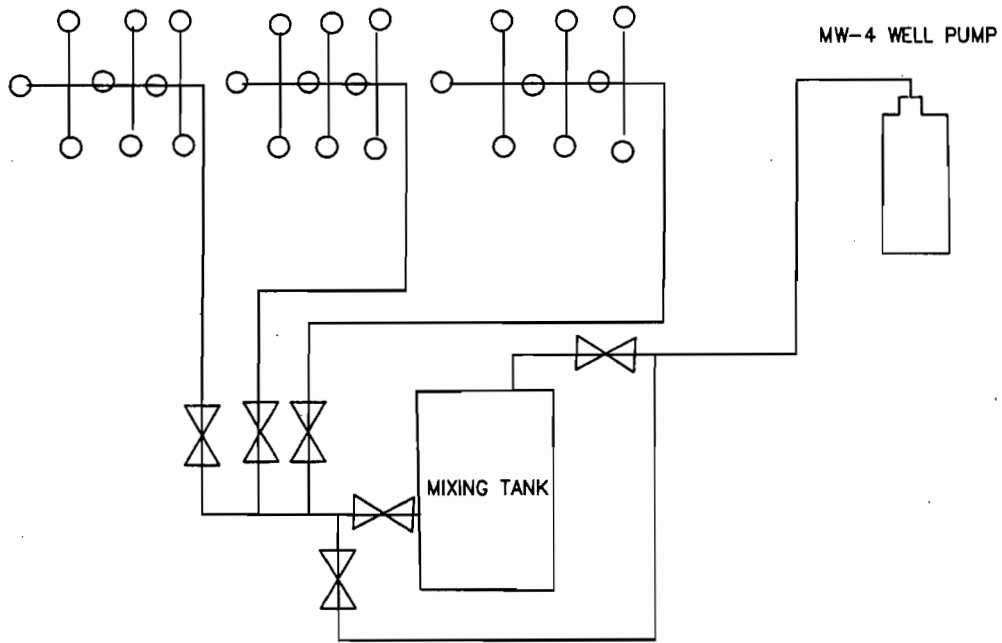
CA RICH CONSULTANTS, INC. Certified Ground-Water and Environmental Specialists 17 Dupont Street, Plainview, New York 11803	
Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: PROPOSED SODIUM PERMANGANATE INJECTION POINT LOCATIONS	
DATE: 4/28/04	
SCALE: 1" = 30'	
FIGURE: 1	CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020
DRAWING NO: 2004-7A	DRAWN BY: S.T.M. APPR. BY: S.J.O.



CA RICH CONSULTANTS, INC. Certified Ground-Water and Environmental Specialists 17 Dupont Street, Plainview, New York 11803	
Stephen J. Osmundsen, P.E. Professional Engineer 513 Centre Island Road, Oyster Bay, New York 11771	
TITLE: TYPICAL PERMANAGANATE INJECTION POINT	DATE: 4/30/04
	SCALE: Not to Scale
FIGURE: 2	DRAWN BY: L.C.R.
DRAWING NO: 2004-8A	APPR. BY: S.J.O.
CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020	



INJECTION POINTS



CA RICH CONSULTANTS, INC.

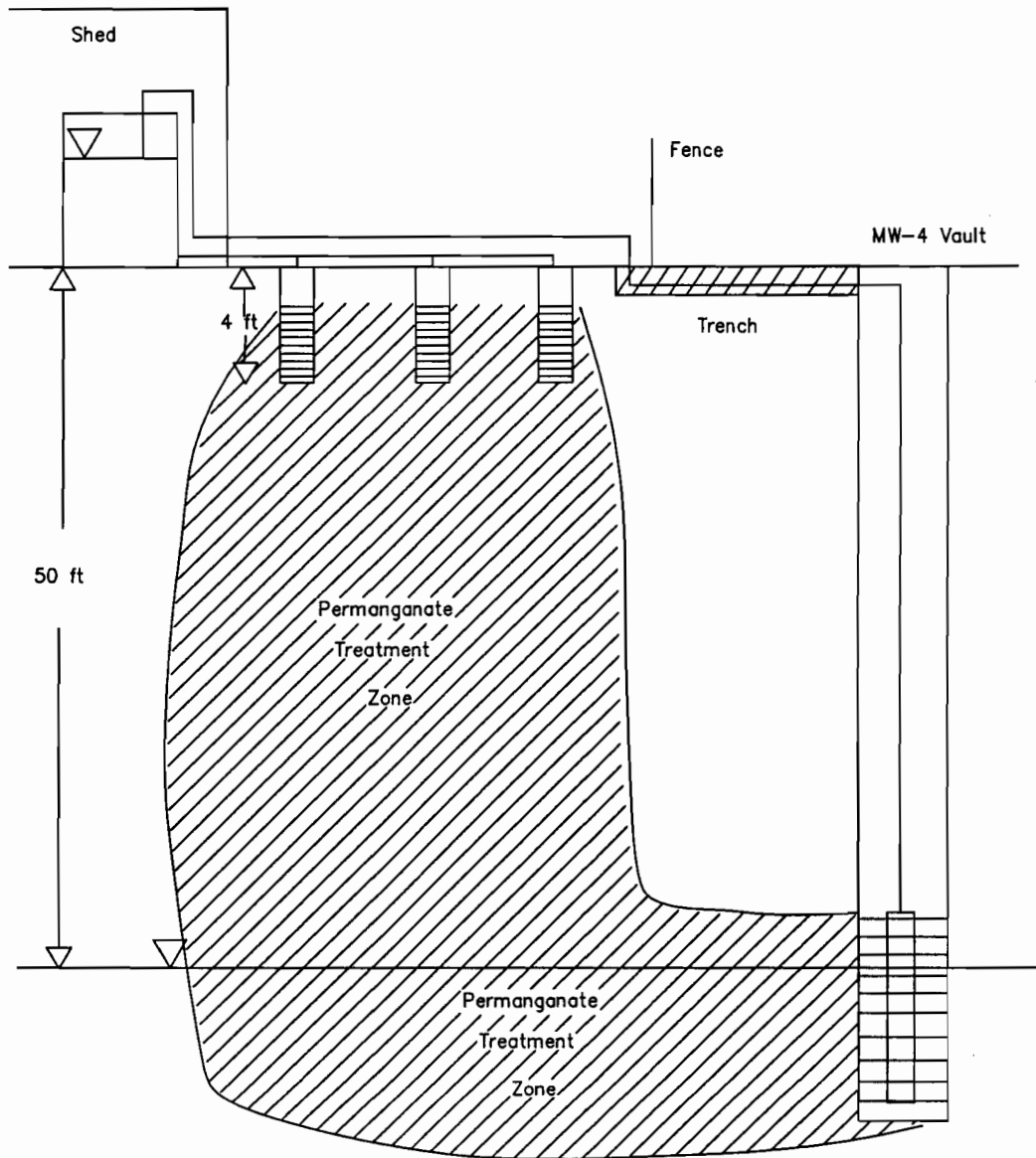
Certified Ground-Water and Environmental Specialists
17 Dupont Street, Plainview, New York 11803

Stephen J. Osmundsen, P.E.

Professional Engineer
513 Centre Island Road, Oyster Bay, New York 11771

TITLE:		DATE:
SCHEMATIC OF THE PIPING SYSTEM		4/30/04
SCALE:		Not to Scale
FIGURE:	DRAWN BY:	
3	L.C.R.	
DRAWING NO:	APPR. BY:	
2004-10A	S.J.O.	

CDC/FLOWER FASHION
47 NORTHERN BLVD.
GREAT NECK, NY 11020



CA RICH CONSULTANTS, INC.

Certified Ground-Water and Environmental Specialists
17 Dupont Street, Plainview, New York 11803

Stephen J. Osmundsen, P.E.

Professional Engineer
513 Centre Island Road, Oyster Bay, New York 11771

TITLE: CROSS-SECTION OF PERMANAGANATE TREATMENT ZONE		DATE: 4/30/04
FIGURE: 4		SCALE: Not to Scale
DRAWING NO: 2004-9A		DRAWN BY: L.C.R.
CDC/FLOWER FASHION 47 NORTHERN BLVD. GREAT NECK, NY 11020		APPR. BY: S.J.O.