CONRAD GEOSCIENCE CORP.
Environmental Scientists
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November 13, 2000

Ramanand Pergadia
NYSDEC Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561-1696

NOV 14 2000

Re: **Remedial Design/Remedial Action Report**;
NYSDEC Site #314094
Conrad Geoscience File #TB000013

Dear Mr. Pergadia:

Enclosed are three bound copies and one unbound copy of the Beekman Highway Garage Remedial Design/Remedial Action (RD/RA) Report, which was accepted by the Department on November 9, 2000. This document is being distributed to the other project contacts, and copies will also be available for public review in the Beekman Library and office of the Town Clerk.

Sincerely,

CONRAD GEOSCIENCE CORP.

John A. Conrad
Senior Hydrogeologist

JAC/erb

cc:

Denise D'Ambrosio	1 copy
Michael Knipfing	1 copy
Salvatore Ervolina	1 copy
G. Anders Carlson	2 copies
Geoff Laccetti	1 copy
Anthony McKee	5 copies
Michael Englert	1 copy
Town Clerk	w/out enclosure
Beekman Library	w/out enclosure

Remedial Design/Remedial Action (RD/RA) Report

BEEKMAN HIGHWAY GARAGE

NYSDEC Site # 3-14-094

Conrad Geoscience Corp. File #TB000010

October 2000

Prepared for:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561

Prepared by:

Conrad Geoscience Corp.
8 Raymond Ave.
Poughkeepsie, New York 12603

Remedial Design/ Remedial Action (RD/RA) Report
BEEKMAN HIGHWAY GARAGE

NYSDEC Site #3-14-094

prepared by:

Conrad Geoscience Corp.
8 Raymond Avenue
Poughkeepsie, New York 12603

OCTOBER 2000

Robert G. Wasp, P.E.
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North Salem, New York 10560

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1.0 EXECUTIVE SUMMARY

This Remedial Design/Remedial Action (RD/RA) Report (Work Plan) for the Town of Beekman Highway Garage inactive hazardous waste disposal site complies with remediation requirements as expressed in the NYSDEC Proposed Remedial Action Plan (PRAP) and Record of Decision (ROD).

Volatile organic compounds (VOCs) in groundwater have been shown to originate from three primary locations on Highway property. The chlorinated solvent 1,1,1-trichloroethane (TCA) was originally discharged near the western end of the Highway pole barn. The chlorinated solvent perchloroethylene (PCE) was originally discharged near the northeastern corner of the pole barn. So-called "BTEX" compounds (benzene, toluene, ethylbenzene and xylene), which are primary constituents of gasoline and diesel fuel, are present in both soil and groundwater because of fuel leakage from underground storage tanks (USTs) near the eastern end of the salt barn.

The New York State Department of Environmental Conservation (NYSDEC) requires either: 1) Excavation and removal of contaminated soil at the former UST area; or 2) Installation of a soil vapor extraction system to extract contaminants from the soil in the unsaturated zone at the former UST area. Of these two options, the Town of Beekman elects to excavate and dispose of approximately 570 cubic yards of petroleum-contaminated soil from the former fuel UST area. The NYSDEC recommends no remediation of groundwater, and is instead requiring that VOCs in groundwater be monitored annually by collecting and analyzing samples of groundwater from existing on-site and off-site wells. Natural processes will, according to the NYSDEC, result in adequate attenuation of solvents and fuel constituents in groundwater. The NYSDEC also requires one round of water quality monitoring for Whaley Creek.

The remedy outlined in this Work Plan, therefore, includes three parts: 1) Excavation and disposal of petroleum-contaminated soil in the former refueling area where gasoline and diesel leaked from USTs prior to their removal; 2) Annual collection and analysis of groundwater samples from ten existing on-site monitoring wells and seven off-site residential wells; and 3) One-time collection and analysis of water samples from Whaley Creek.

2.0 SUMMARY OF PAST STUDIES AND ACTIONS

This proposed Work Plan is based on the results of the 1996 Preliminary Site Assessment (PSA), the 1998 Remedial Investigation (RI), and the 1999 Focused Feasibility Study (FS); and is meant to comply with remediation requirements as expressed in the NYSDEC Proposed Remedial Action Plan (PRAP) and Record of Decision (ROD).

2.1 Preliminary Site Assessment

As early as 1992, the chlorinated solvents 1,1,1-trichloroethane (TCA) were detected in residential wells down-gradient from the Town of Beekman Highway Department facility in the Hamlet of Poughquag, New York. The New York State Department of Environmental Conservation (NYSDEC) placed the 10-acre Town property on the State registry of potential hazardous waste disposal sites (Site #314094).

Groundwater samples collected in December 1994 indicated that TCA, PCE and other VOCs had been disposed of on Highway property, and on that basis the Town property was designated a Class 2 inactive hazardous waste disposal site in May 1995. At that time, dissolved solvents were known to extend approximately 1,100 to 1,200 feet into the Hamlet south of the Highway garage.

In May 1996, the NYSDEC released its Preliminary Site Assessment (PSA) report, which summarized the results of past on-site and off-site sampling, including monitoring wells and residential supply wells. The PSA report concluded that chlorinated solvents in groundwater had originated on Highway property, but the precise waste disposal locations remained unconfirmed until Conrad Geoscience mapped the on-site distribution of contaminants during the Remedial Investigation in 1997 (see Section 2.2).

In 1997 and 2000, most Hamlet residences down-gradient of the Highway site were connected to a central water system, and homes connected to this system no longer rely on individual wells for drinking water.

2.2 Remedial Investigation

From June through December 1997, the Town of Beekman conducted a Remedial Investigation (RI) to more precisely pinpoint the sources of solvent contamination on Town premises so that appropriate remedial actions could be selected. The RI report dated March 1998 confirmed that two overlapping plumes of dissolved solvents, TCA and PCE, originate from separate locations adjacent to the Highway pole barn. From these discharge locations, dissolved solvents are carried southward with the flow of groundwater. Figures 1, 2 and 3 show the areas

within which VOCs have been detected in groundwater, as inferred from groundwater samples and soil gas measurements. Petroleum constituents, so-called "BTEX" compounds (benzene, toluene, ethylbenzene & xylene), are also present on-site (Figure 4). Soil borings in the former gasoline and diesel tank area near the east end of the Highway salt barn revealed petroleum-contaminated soil, presumably from tank leakage prior to removal of the underground storage tanks (USTs) in 1989 and 1993.

2.3 Feasibility Study

In March 1999, the Town of Beekman submitted a Focused Feasibility Study (FFS) report to the NYSDEC, which included recommendations for remediating the Beekman Highway site. Among the remedial alternatives considered were: 1) No Action; 2) Long-term Monitoring of Natural Attenuation; 3) Source Area Excavation combined with Natural Attenuation; and 4) Soil Vapor Extraction (SVE) combined with Natural Attenuation.

2.4 Proposed Remedial Action Plan

In March 1999, the NYSDEC issued a Proposed Remedial Action Plan (PRAP), which was based on the findings of the RI report and FFS. The PRAP selected Alternative #3 or #4 as the remedial program, which would consist of: 1) Annual testing of existing groundwater monitoring wells and residential wells; 2) Removal of petroleum-contaminated soil in the former underground storage tank area; or, alternatively, removal of soil contaminants via soil vapor extraction (SVE); and 3) One round of sampling/analysis for Whaley Creek surface water. The FFS and PRAP were the subject of a public hearing in March 1999.

2.5 Record of Decision

In November 1999, the NYSDEC issued its Record of Decision (ROD), in which Remedial Alternatives #3 or #4 were formally adopted. Alternative #3 calls for excavation and removal of contaminated soil at the former underground storage tank (UST) areas. Alternative #4 calls for installation of a soil vapor extraction (SVE) system to extract contaminants from soil in the unsaturated zone of the former UST areas and operate the system until the NYSDEC determines that its continued use would no longer be productive.

3.0 REMEDIAL ACTION PLAN

This Remediation Work Plan reflects those remedial actions called for by the NYSDEC in the PRAP and ROD. The plan has three main components: 1) Removal of petroleum-contaminated soil from the former UST area; 2) Long-term groundwater monitoring; and 3) Collection and analysis of surface water samples from Whaley Creek. The removal of petroleum contaminated soil in the former fuel UST area will eliminate a potential source of ongoing groundwater contamination. Source removal sometimes lessens the duration and expense of groundwater remediation by removing contaminants before they reach groundwater. The long-term groundwater monitoring program is meant to accomplish several objectives: 1) Monitor the natural attenuation of solvents and other VOCs present in groundwater to establish whether VOC concentrations are increasing, decreasing or stabilizing over time; and 2) Determine whether on-site VOCs are moving off-site.

3.1 Soil Removal and Disposal in Former UST Area

According to the Focused Feasibility Study (FFS) report (LMS, 1999), approximately 410 yd^3 of petroleum-contaminated soil are present in the former underground storage tank (UST) area near the northeastern corner of the salt barn (Figure 5 & 6). Contaminants in this area include the petroleum constituents benzene, toluene, ethylbenzene, and xylene (BTEX). The chlorinated solvent perchloroethylene (PCE), which is not a fuel constituent, is also present.

The depth of contamination ranges from 3 to 14 feet below ground surface. Depth to groundwater ranges from 12 to 14 feet below ground surface. Although no monitoring wells have been installed in the former fuel tank area, groundwater is presumed to have been contaminated in this area. Petroleum constituents and other VOCs have been detected in Monitoring Well MW-5 and in a nearby residential well (tax parcel #885713).

3.1.1 Excavation, Stockpiling and Backfilling

Prior to the start of field work, the proposed soil excavation area will be established by measuring from existing buildings and other physical features with a measuring tape. Stakes or paint markings will be placed to mark the anticipated boundaries of excavation. Arrangements will be made for a mark-out of underground utilities. The NYSDEC will be notified prior to excavation.

Soil will be removed from the area depicted in Figure 6 using an excavator. Excavated soil will be temporarily stockpiled on-site in an area designated by the Highway Department. All excavated soil will be stockpiled on 6-mil polyethylene sheeting pending receipt of laboratory reports for soil samples. Soil will be staged in an area that will not be affected by surface drainage. Soil stockpiles will be covered with 6-mil polyethylene sheeting to prevent soil from washing onto the ground. Soil will remain stockpiled on site for 30 to 60 days, until laboratory data are received and evaluated.

Soil will be removed to a maximum depth of approximately 12 feet, the anticipated depth of the top of the saturated zone (water table).

A photoionization detector (PID) will be used to screen soil in the field for VOCs using headspace techniques. Soil samples will be sealed in plastic bags, and a PID reading for the headspace in each bag will be recorded.

Following soil removal and sample collection, the excavation will be lined with plastic sheeting, backfilled to grade with clean fill, and repaved. Contaminated soil will be transported off-site to a permitted recycling or disposal facility. The NYSDEC will be notified when this facility is selected. Each truck will be properly manifested to transport contaminated soil prior to leaving the site.

3.1.2 Soil Sample Collection

A minimum of twenty soil samples from the excavation will be collected for analysis by a NYSDOH ELAP certified laboratory. Samples will be collected from the bottom and sidewalls of the excavation in order to document the condition of soil remaining in the ground at the conclusion of the soil removal program. Post-excavation soil samples will be collected at the rate of one sample every 200 ft^2. A minimum of four samples per sidewall and four samples from the bottom of the excavation will be analyzed. Some samples from the interior of the contaminated zone may also be collected to document the pattern and type of contamination.

Soil samples will be handled with disposable gloves and/or a pre-cleaned, stainless steel spatula or spoon, and will be placed into laboratory-supplied, pre-cleaned sample containers. If the sample will be used for field headspace screening, the sample will be placed into a disposable, sealable plastic bag. Sample containers will be stored on-site in a cooler at 4°C.

Sample containers will be labeled with appropriate information such as client name, site location, sample identification (location, depth, etc.), date and time of collection, and sampler's initials. A chain-of-custody form will be completed for all samples collected. One copy is retained and two are sent with the samples to the laboratory. A custody seal will be placed on the cooler prior to shipment. Samples will be shipped to the laboratory within 24 hours of collection.

Soil characteristics will be logged in the field (color, odor, moisture, texture, density, consistency, organic content, layering, grain size, etc.) The field notebook and appropriate forms will include, but not be limited to the following: Client name, site location, sample location, sample depth, sample identification, date and time collected, sampler's name, method of sample collection, number and type of containers, geologic description of material, PID readings, description of decontamination procedures, etc. A site map will be prepared with exact measurements to each sample location in case follow-up sampling is necessary.

3.1.3 Soil Sample Analysis

Post-excavation soil samples will be analyzed for the following parameters:

- Target Compound List of Volatile organic compounds (VOCs) via USEPA Method 8260
- STARS List of VOCs vial USEPA Method 8021(including MTBE)
- STARS List of semi-volatile organic compounds (SVOCs) via USEPA Method 8270

A minimum of seven soil samples will be analyzed for waste disposal characterization purposes. Waste characterization samples will be composited and analyzed for every 60 cubic yards of soil excavated, which will be combined from samples collected from every 20 cubic yards of soil excavated. Waste characterization requirements will be determined by the disposal/recycling facility. It is anticipated that the analysis will include, at a minimum:

- VOCs via the Toxicity Characteristic Leachate Procedure (TCLP)
- SVOCs via TCLP
- Total lead
- Ignitability

SAMPLING AND ANALYSIS PLAN
SOIL EXCAVATION PROGRAM

Sample Type	Analytical Method						
	TCL VOCs via USEPA Method 8260	STARS VOCs via USEPA Method 8021	STARS SVOCs via USEPA Method 8270	VOCs via TCLP Methods	SVOCs via TCLP Methods	Total Lead	Ignitability
Post-excavation Soil Sample	20 (+3 Trip Blanks)	20 (+3 Trip Blanks)	20	--	--	--	--
Stockpiled Waste Characterization Sample	--	--	--	7	7	7	7

Quality assurance and quality control (QA/QC) samples will consist of one trip blank for VOCs for each sample shipment. No field blanks will be prepared for the soil sampling portion of the workplan. ASP Category "B" deliverables will be prepared and the data will be validated by an independent validator.

3.1.4 Soil Disposal/Recycling

When waste characterization analyses are complete, the NYSDEC will receive copies of the laboratory results. Upon approval by the NYSDEC, stockpiled soil will be loaded into trucks and transported by licensed transporters to an approved disposal or recycling facility. Weigh bills, manifests, and certificates of destruction from this facility will be included in the final report.

3.1.5 Decontamination

The excavator bucket will be steam-cleaned prior to excavation, and all sampling equipment that comes into contact with contaminated soil will be decontaminated to prevent cross-contamination. Rinse water will be drummed and sampled prior to disposal. The following decontamination procedure will be used:

Brush/wipe off gross contamination;
Tapwater rinse;
Alconox (detergent) rinse;
Tapwater rinse;
Methanol rinse;
De-ionized water rinse.

3.2 Long-Term Groundwater Monitoring Program

The Record of Decision (ROD) indicates that contaminants in soil and groundwater on the Town site have resulted in a significant threat to human health and the environment. Accordingly, the ROD includes requirements for long-term groundwater monitoring of migration and attenuation of the contaminant plume over time. The monitoring program will continue until contaminant concentrations show a steadily decreasing trend sufficient to be protective of public health and the environment.

The Record of Decision (ROD) suggests monitoring on-site "monitoring wells MW-3, MW-5, MW-16R and MW-18S...(and) five private wells at residences not supplied with municipal water and three impacted private wells that are no longer in use." This RD/RA plan proposes an alternative, expanded sampling program so that natural attenuation in the most contaminated areas can be more effectively monitored. The long-term groundwater monitoring program for the Beekman Highway Garage will include annual sampling of ten on-site monitoring wells and seven off-site residential wells.

Seven residences have been selected for long-term monitoring, five of which are supplied with municipal water, and two of which are not supplied with municipal water. Of these, four have impacted wells that are no longer in use (Phillips, Delamarter, Bischoff, Huttel); and three (Perri, Jarry and Goldsand) are residential wells that were never impacted but are within the apparent flow path of dissolved solvents. In addition, we propose to monitor ten on-site monitoring wells installed in or near solvent discharge locations and along the down-gradient perimeter of the Town property. Our reasoning for this plan is as follows:

- The ROD states that the purpose of the long-term groundwater monitoring program is "to assess the reduction in groundwater contaminant concentrations over time." (p.19)

- Wells at residences not served by municipal water have been sampled previously and were found not to contain volatile organic compounds (VOCs). These wells are apparently outside the flow path of VOCs.

- The ROD concludes that "ingestion of contaminated water has been eliminated" as a potential exposure pathway. (p. 12)

The expanded, 17-well monitoring program we propose will provide better information about VOC attenuation, which will occur primarily on the Town site where VOCs were originally disposed and where concentrations are highest (MW-4, MW-8, MW-18S, MW-18D, MW-19S, MW-19D). Perimeter monitoring wells MW-3, MW-5, MW-16R and MW-17 will provide an early warning if VOCs are transported off-site in significant quantities.

Similarly, off-site monitoring will be most useful if we test wells for which historical VOC impacts have already been measured (Phillips, Huttel, Delamarter, Bischoff). Samples from the Perri, Jarry and Goldsand wells have never contained VOCs, but these wells appear to be down-gradient of most of the affected residences.

The enclosed drawing (Figure 8) shows the locations of wells we propose to include in the monitoring program.

3.2.1 On-Site Groundwater Monitoring

According to the Focused Feasibility Study (FFS) and Remedial Investigation (RI), 10 of the 13 on-site monitoring wells are in or down-gradient of the three primary VOC disposal areas. Two other on-site monitoring wells (MW-1 and MW-7) are up-gradient of known disposal points, and MW-2 appears to lie just outside of the dissolved solvent plumes.

On-site monitoring wells selected for inclusion in the groundwater monitoring program include: MW-3, MW-4, MW-5, MW-8, MW-16R, MW-17, MW-18S, MW-18D, MW-19S, and MW-19D (Figure 8).

Monitoring wells MW-5, MW-16R, and MW-17 are located along the southern boundary

of the site, are down-gradient of known VOC disposal areas, and are within the VOC plumes. These wells have shown stable or increasing concentrations of VOCs since 1994 (Table 1).

Monitoring wells MW-4 and MW-8 are in the main operating area of the Highway garage operation, and are situated immediately down-gradient of the main PCE disposal locations. Both MW-4 and MW-8 have historically contained relatively high concentrations of VOCs. Total VOCs may be declining in MW-8, and PCE in this location may also be undergoing transformation to trichloroethylene (TCE). Concentrations of VOCs in MW-4 have increased significantly since 1994, indicating southward movement of PCE with the flow of groundwater.

Monitoring wells MW-18S and MW-18D are located in the up-gradient end of the PCE plume in the approximate location where PCE was originally discharged in the greatest amounts. MW-18S is screened across the water table, and has shown declining concentrations of VOCs since 1994. MW-18D is screened just above bedrock at a depth of 44 to 54 ft, and showed no detectable VOCs when sampled after its installation in 1997.

Monitoring wells MW-19S and MW-19D are located in the up-gradient end of the TCA plume in the approximate location where TCA was originally discharged in the greatest amounts. MW-19S is screened across the water table, and showed only traces of VOC contamination when first installed in 1997. MW-19D is screened just above bedrock at a depth of 52 to 62 ft, and contained toluene and naphthalene when last sampled in 1997, and a trace of TCA.

3.2.2 Off-Site Groundwater Monitoring

Although TCA and PCE are known to have traveled a significant distance off-site, these solvents have not been detected in all down-gradient wells. The occurrence of VOCs in residential supply wells down-gradient of Highway disposal locations appears to be partly dependent on well depth, but the pattern of off-site groundwater contamination from well to well is unpredictable.

The seven five off-site monitoring wells selected for inclusion in the groundwater monitoring program are: Tax lot #840725 (Phillips); #793689 (Delamarter); #802635 (Bischoff); #805620 (Perri); #885713 (Huttel); #807590 (Jarry); and #796580 (Goldsand) [Table 2] Sample collection from these wells requires that the resident give permission for sampling, and that the supply well can be made operable for sample collection. Should sampling of the proposed wells be impossible, alternate wells will be selected in consultation with the NYSDEC and NYSDOH.

Supply well #840725 (Phillips) is believed to be 94 ft deep, and in 1994 and 1996 contained traces of PCE and TCA This well is immediately down-gradient of Monitoring Well MW-5, which in 1997 contained VOCs totaling 45 ug/l (ppb). In 1994, no VOCs were detected in MW-5, and the NYSDEC concludes that petroleum constituents have moved to this location from the former refueling area (Record of Decision, p. 12).

Supply well #885713 (Huttel) is southeast of the Highway site, and, until 1999, consistently showed nondetectable VOCs. A well sample in 1999, however, contained VOCs totaling 209 ug/l, most of which are normally associated with fuel spills.

Supply well #793689 (Delamarter) is believed to be 3.5 ft deep, and TCA concentrations in this well have declined from 200 ug/l in 1994 to 4 ug/l in 1996. This well also contained a trace of PCE in 1994.

Supply well #802635 (Bischoff) is believed to be 90 ft deep, and PCE concentrations have declined to 4 ug/l since 1994. In 1996, a trace of TCA was detected in this well.

Supply well #805620 (Perri) is believed to be 200 ft deep, and although this well appears to lie squarely within the path of the overlapping PCE and TCA plumes, VOCs have never been detected in this well.

Supply wells #807590 (Jarry) and #796580 (Goldsand) are of undetermined depth, and VOCs have not been detected in previous rounds of sampling.

3.2.3 Groundwater Sample Collection Procedures

After opening each monitoring well, the depth to water will be measured to the nearest 0.01 foot using an electronic sounding device. Using the total depth of the well established during well installation, the volume of standing water in the well will be calculated and recorded in the field notebook.

Prior to sample collection, wells will be purged of a minimum of three well volumes, or until the physical characteristics (temperature, pH and conductivity) have stabilized. In general, three to five well volumes is sufficient to accomplish this goal. Purge water will be contained in drums temporarily until analytical data are received from the laboratory. Waste water requiring off-site disposal will be removed in bulk using a vacuum truck. Proper disposal alternatives may include off-site disposal at regulated facilities.

A bailer will be used to collect a groundwater sample from each monitoring well. The sample will be dispensed from the bailer directly into the appropriate sample container. Residential wells will be sampled directly from the tap after physical characteristics have stabilized.

Sample containers will be labeled with appropriate information such as site location, sample identification (location, depth, etc.), date and time of collection, analysis requested, and sampler's initials. A chain-of-custody form will be completed for all samples collected. One copy is retained and two are sent with the samples to the laboratory. A custody seal will be placed on the cooler prior to shipment. Samples will be shipped to the laboratory within 24 hours of collection.

3.2.4 Laboratory Analysis of Groundwater Samples

Groundwater samples collected from monitoring wells and residential wells will be shipped to a NYSDOH-certified laboratory for analysis for following analytical parameters:

- Target Compound List (TCL) Volatile Organic Compounds (VOCs) via EPA Method 8260 (including MTBE)
- Total organic carbon

Field quality control samples will include:

- Trip Blanks - One trip blank will accompany each day's sample shipment to the laboratory. The trip blank will be analyzed for VOCs only.
- Field Equipment Blanks - One equipment blank will be prepared an analyzed for VOCs only.

ASP Category "B" deliverables will be prepared and the data will be validated by an independent validator.

SAMPLING AND ANALYSIS PLAN
GROUNDWATER MONITORING

Sample Type	Analytical Method	
	VOCs via USEPA Method 8260	Total Organic Carbon
Groundwater Monitoring Well	10 + 1Trip Blank & 1 Field Blank	10 + 1 Field Blank
Residential Supply Well	7 + 1 Trip Blank & 1 Field Blank	7 + 1 Field Blank

3.2.5 Year-by-Year Cleanup Goals

Concentrations of PCE and total VOCs in groundwater are expected to gradually attenuate through natural processes. Of the 17 wells included in the long-term groundwater monitoring program, three on-site monitoring wells, MW-18S, MW-4 and MW-5, will be subject to year-by-year cleanup goals that have been determined by the NYSDEC. The annual cleanup goals for each well are listed in the table below. For Monitoring Well MW-18S, both PCE and total VOCs will be subject to decreasing cleanup goals. For Monitoring Well MW-4, PCE only will be subject to yearly goals. And for Monitoring Well MW-5, total VOCs will be subject to yearly cleanup goals.

Should the maximum concentrations at any of these three wells exceed the cleanup goal by 20% for three consecutive years, consideration will be given to implementing further investigation or remedial actions. Concentrations in the other 14 wells will be monitored for upward and downward trends, but will not be subject to specific yearly cleanup goals.

YEARLY GROUNDWATER CLEANUP GOALS

Year	*MW-18S* PCE (ug/l)	*MW-18S* Total VOCs (ug/l)	*MW-4* PCE (ug/l)	*MW-5* Total VOCs (ug/l)
1	326	311	75	142
2	242	287	62	139
3	179	264	51	135
4	133	244	42	132
5	99	225	35	129
6	73	207	29	126
7	54	191	24	122
8	40	176	19	119
9	30	163	16	116
10	22	150	13	113
11	16	138	11	110
12	12	128	9	108
13	9	118	7	105
14	7	108	6	103
15	5	100	5	100

3.3 Stream Sampling

Three water samples will be collected from Whaley Creek and analyzed for VOCs via EPA Method 8260. Only one round of surface water sampling is planned. One grab sample will be collected from a section of the stream believed to be downstream of its intersection with the solvent plumes. Two samples will be collected from sections of the stream believed to have been potentially impacted by contaminated groundwater (See Figure 8).

3.4 Report Preparation

Following completion of all tasks, and following receipt of all laboratory results and soil disposal documentation, a report will be submitted to the NYSDEC summarizing the results of this work. The report will include a summary of tasks completed, conditions encountered, deviations from the Work Plan, analytical results, and recommendations for additional work or modifications to the Plan, as necessary.

Subsequent reports of annual groundwater monitoring will include summary data tables, and the tables will include a comparison to regulatory standards and to results from previous rounds.

In addition to the above referenced report, the Town of Beekman will submit monthly progress reports to the NYSDEC until the remedial actions are completed and the final report is submitted.

3.5 Schedule

Soil excavation, stockpiling and backfilling will take approximately 5 days to complete. A two-week turnaround will be requested for waste characterization laboratory results. Loading and transport of contaminated soil will take approximately 2 days, following receipt of waste characterization results. One round of groundwater sampling will take 2 days for fieldwork, and 2 weeks for laboratory turnaround. The final report will be submitted to the NYSDEC within 4 weeks of receipt of all laboratory reports.

We anticipate soil excavation to occur in November 2000. Soil loading and disposal will occur after receipt of laboratory results, in December 2000. The first annual round of groundwater monitoring will occur in November 2000, and will be repeated each November thereafter. Surface water sample collection will occur in November 2000. The final remediation report will be submitted to the NYSDEC in February 2001.

- **November 2000**

  Soil Excavation & Stockpiling
  First Annual Round of Groundwater Monitoring
  Surface water Sample Collection

- **December 2000**

  Soil Loading Transport & Off-Site Disposal/Recycling

- **February 2001**

  Submittal of Final Remediation Report
  Submittal of First Annual Groundwater Report

3.6 Health & Safety Plan

Appendix C

3.7 Citizen Participation Plan

Appendix D

3.8 Quality Assurance, Quality Control (QA/QC) Plan

Appendix E

3.9 Operation & Maintenance Manual

Appendix F

References Cited

New York State Department of Environmental Conservation; May 15, 1996; Preliminary Site Assessment Report (PSA); Beekman Town Garage, Beekman, Dutchess.

Conrad Geoscience Corp.; March 13, 1998; Focused Remedial Investigation Report (RI), Beekman Highway Garage, Poughquag, New York; Site #3-14-094;

Lawler Matusky & Skelly Engineers, LLP; March 1999; Focused Feasibility Study Report (FFS), Beekman Highway Garage Site, Hamlet of Poughquag, Dutchess County, New York; NYSDEC Site #3-14-094.

New York State Department of Environmental Conservation; February 1999; Proposed Remedial Action Plan (PRAP); Beekman Highway Garage, Town of Beekman, Dutchess County, New York; Site #3-14-094.

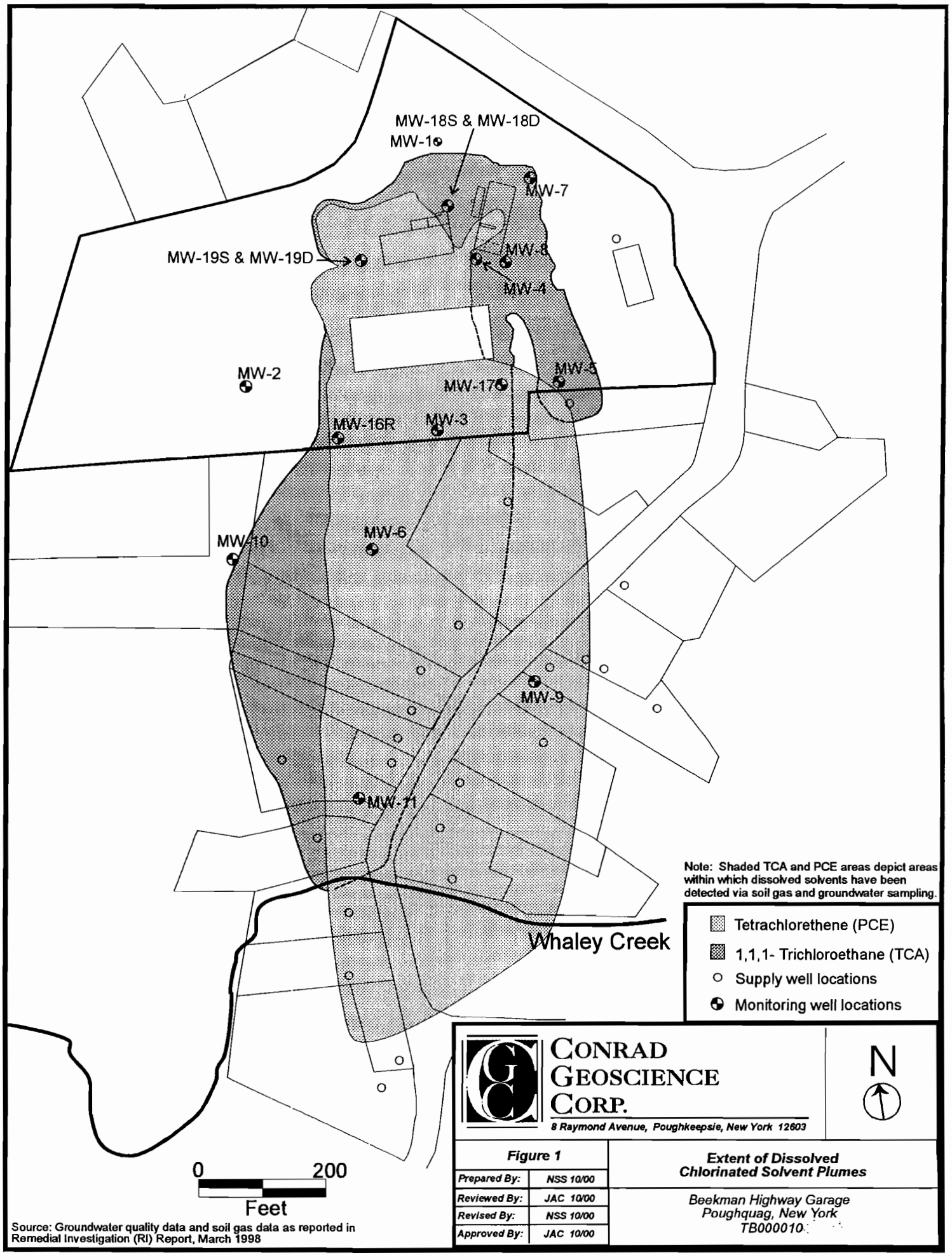
New York State Department of Environmental Conservation; November 1999; Record of Decision (ROD), Beekman Town Garage Site, Town of Beekman, Dutchess County, New York, Site #3-14-094.

New York State Department of Environmental Conservation; August 1992; Spill Technology and Remediation Series (STARS) Memo #1 - Petroleum-Contaminated Soil Guidance Policy; Division of Spills Management.

New York State Department of Environmental Conservation; 1994; Division of Water Technical and Operational Guidance Series (TOGS); Ambient Water Quality Standards and Guidance Values.

New York State Department of Environmental Conservation; 1994; Technical and Administrative Guidance Memorandum (TAGM); Determination of Soil Cleanup Objectives and Cleanup Levels.

APPENDIX A:
FIGURES



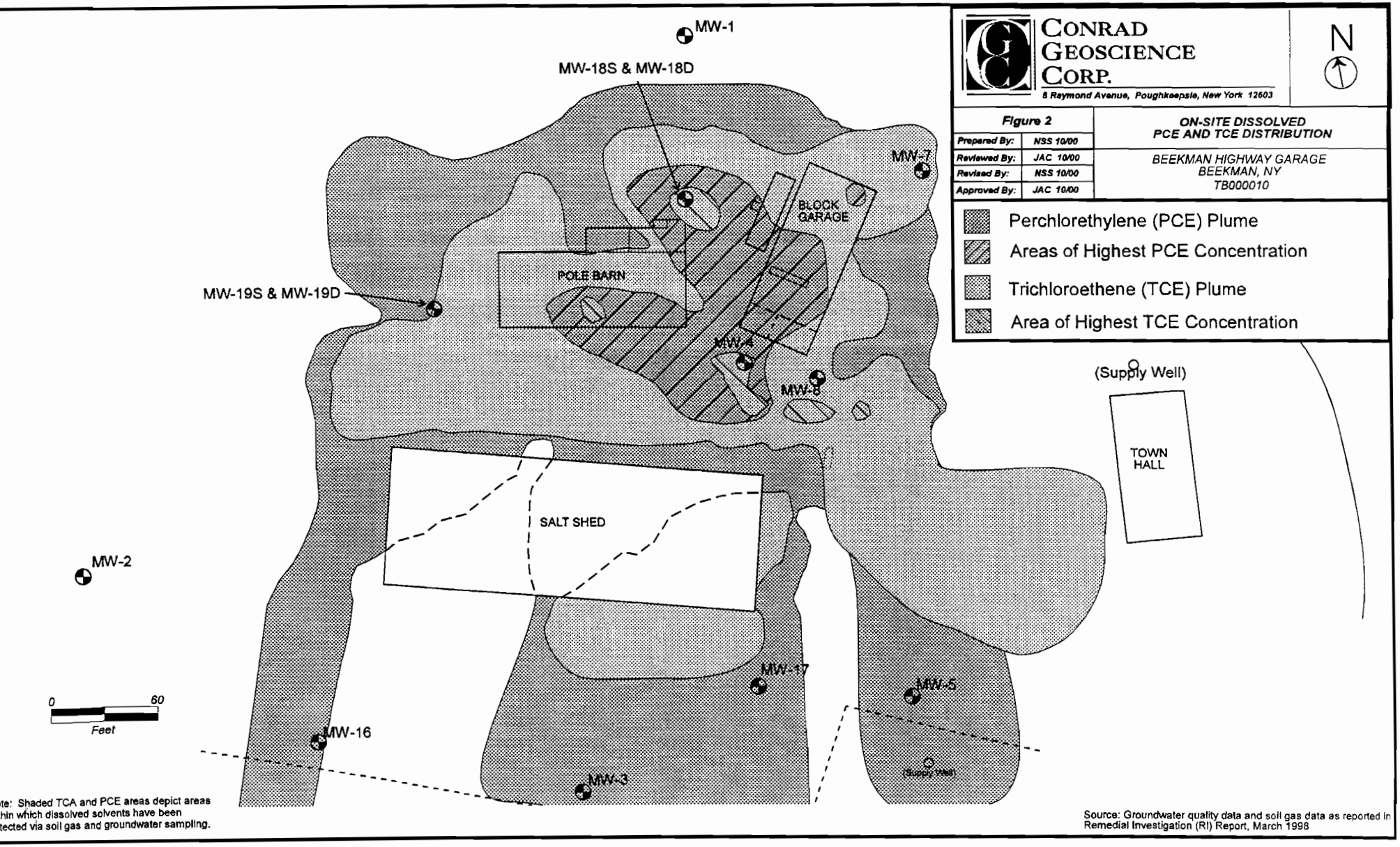
CONRAD GEOSCIENCE CORP.

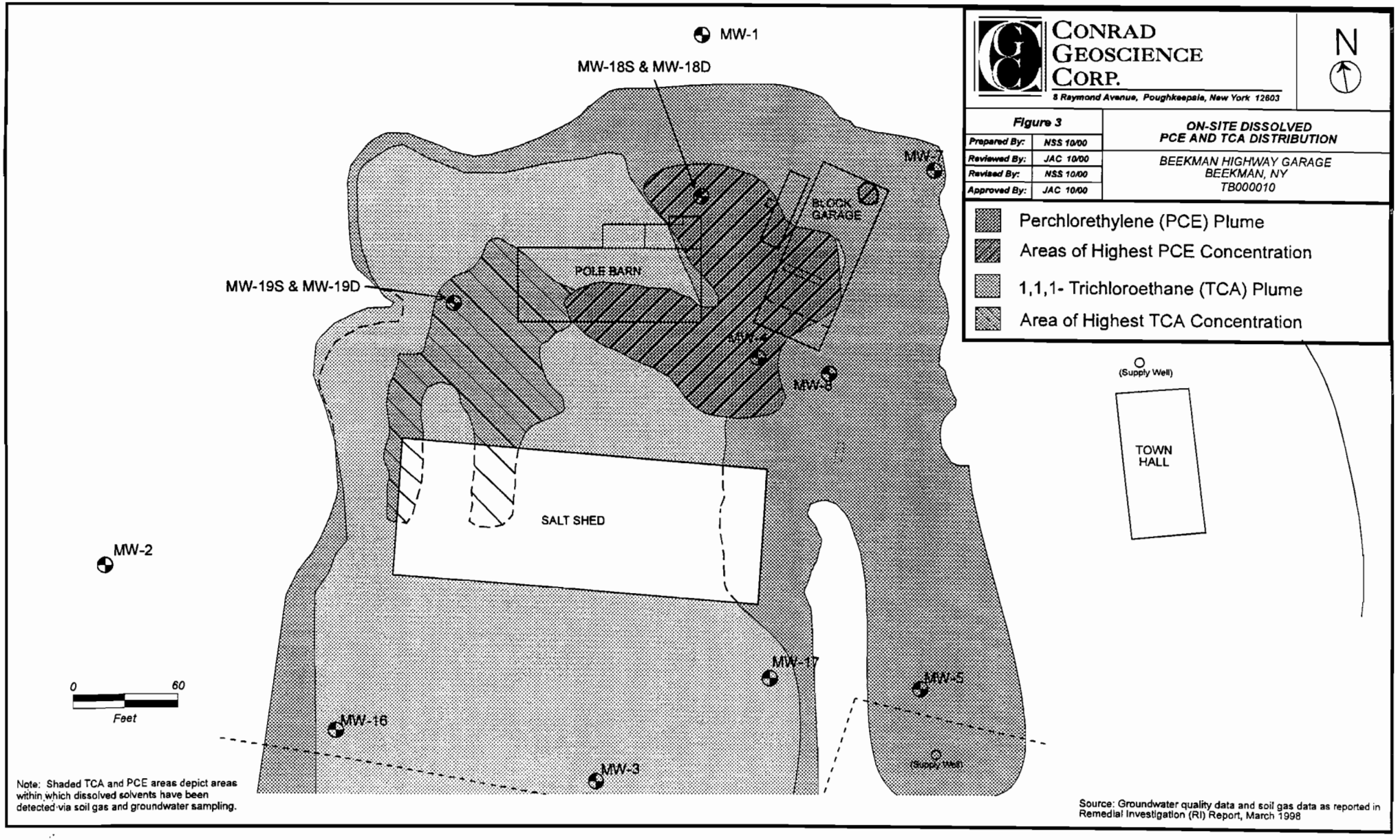
8 Raymond Avenue, Poughkeepsie, New York 12603

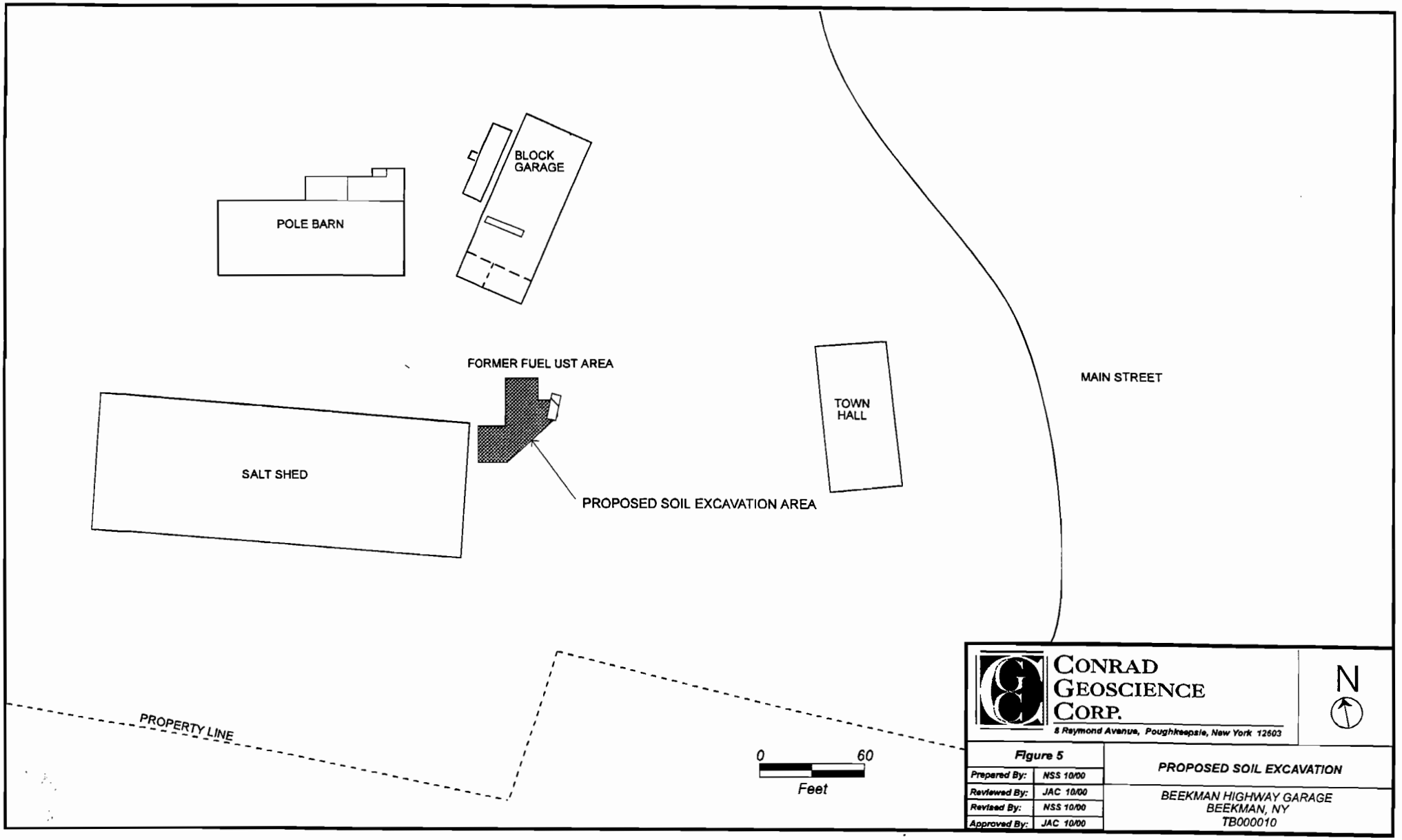
Figure 1	
Prepared By:	NSS 10/00
Reviewed By:	JAC 10/00
Revised By:	NSS 10/00
Approved By:	JAC 10/00

Extent of Dissolved Chlorinated Solvent Plumes

Beekman Highway Garage
Poughquag, New York
TB000010


MW-1
MW-18S & MW-18D
MW-7
BLOCK GARAGE
POLE BARN
MW-19S & MW-19D
MW-4
MW-8
(Supply Well)
TOWN HALL
SALT SHED
MW-2
MW-17
MW-5
MW-16
MW-3
(Supply Well)
0
60
Feet
N
CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603
Figure 2
ON-SITE DISSOLVED PCE AND TCE DISTRIBUTION
Prepared By: NSS 10/00
Reviewed By: JAC 10/00
Revised By: NSS 10/00
Approved By: JAC 10/00
BEEKMAN HIGHWAY GARAGE
BEEKMAN, NY
TB000010
Perchlorethylene (PCE) Plume
Areas of Highest PCE Concentration
Trichloroethene (TCE) Plume
Area of Highest TCE Concentration
te: Shaded TCA and PCE areas depict areas
hin which dissolved solvents have been
tected via soil gas and groundwater sampling.
Source: Groundwater quality data and soil gas data as reported in
Remedial Investigation (RI) Report, March 1998


MW-1
MW-18S & MW-18D
MW-7
BLOCK GARAGE
POLE BARN
MW-19S & MW-19D
MW-4
MW-8
(Supply Well)
TOWN HALL
SALT SHED
MW-2
MW-17
MW-5
MW-16
MW-3
(Supply Well)
0
60
Feet
CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603
N
Figure 3
ON-SITE DISSOLVED PCE AND TCA DISTRIBUTION
Prepared By: NSS 10/00
Reviewed By: JAC 10/00
Revised By: NSS 10/00
Approved By: JAC 10/00
BEEKMAN HIGHWAY GARAGE
BEEKMAN, NY
TB000010
Perchlorethylene (PCE) Plume
Areas of Highest PCE Concentration
1,1,1- Trichloroethane (TCA) Plume
Area of Highest TCA Concentration
Note: Shaded TCA and PCE areas depict areas within which dissolved solvents have been detected via soil gas and groundwater sampling.
Source: Groundwater quality data and soil gas data as reported in Remedial Investigation (RI) Report, March 1998

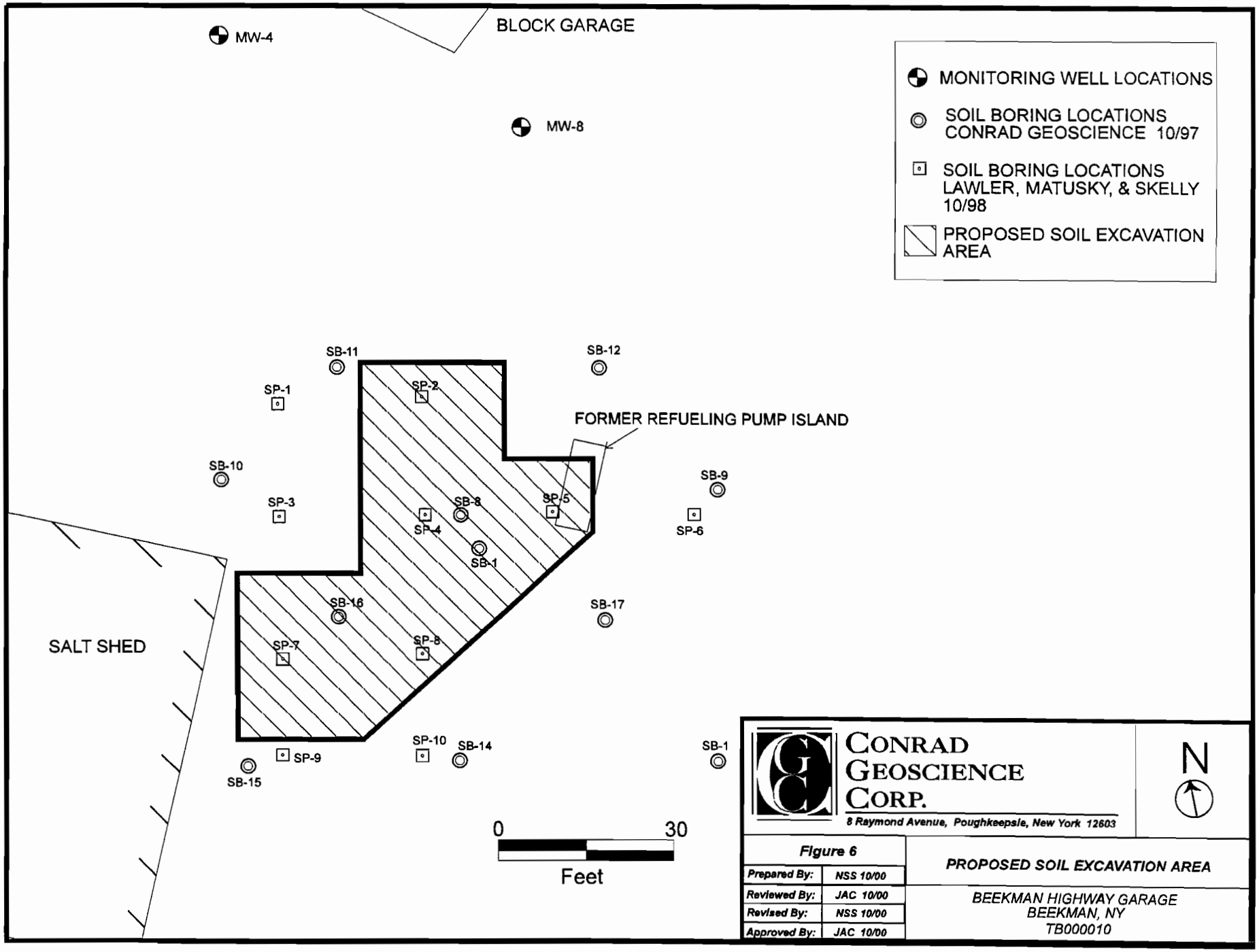


CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 5	
Prepared By:	NSS 10/00
Reviewed By:	JAC 10/00
Revised By:	NSS 10/00
Approved By:	JAC 10/00

PROPOSED SOIL EXCAVATION

BEEKMAN HIGHWAY GARAGE
BEEKMAN, NY
TB000010

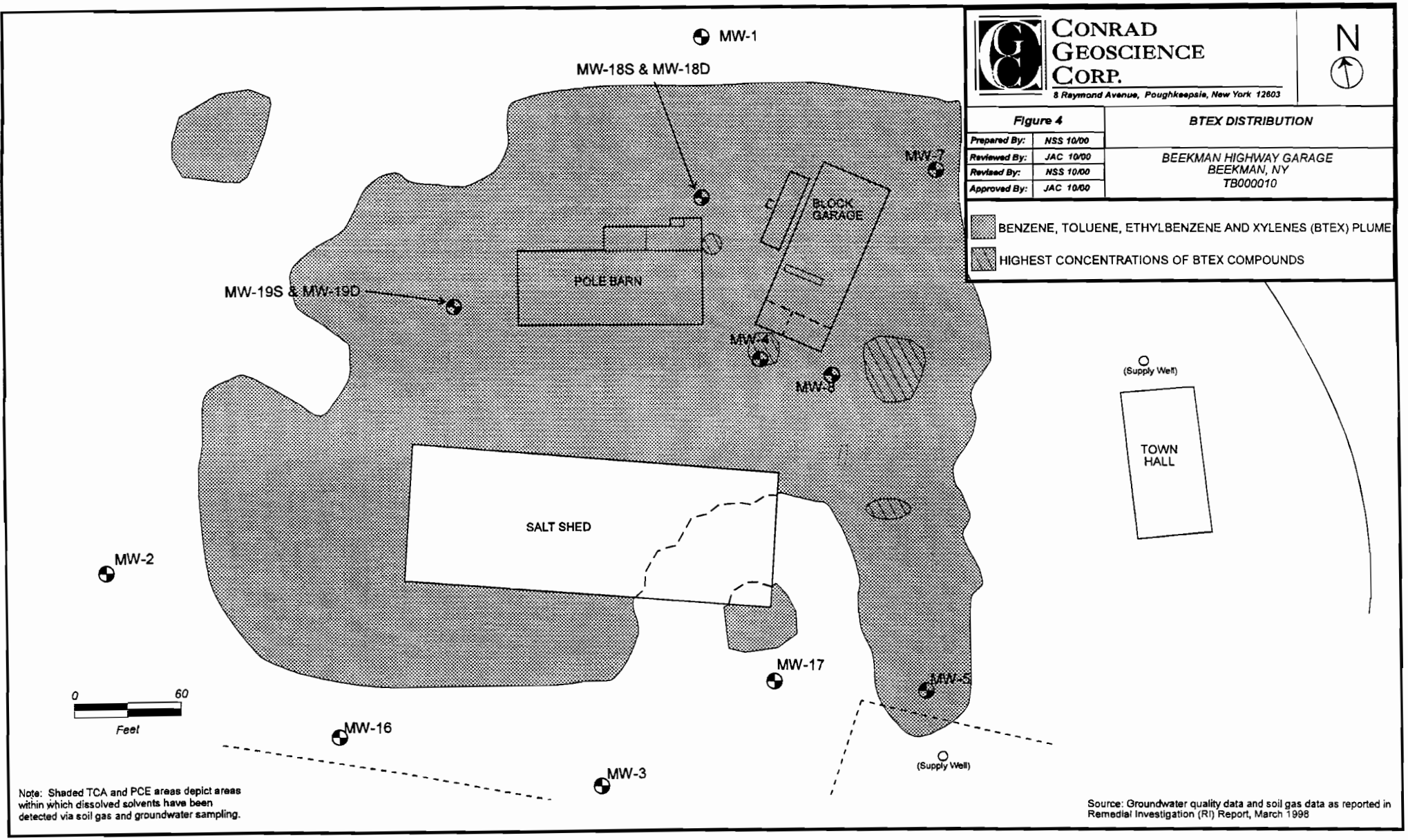


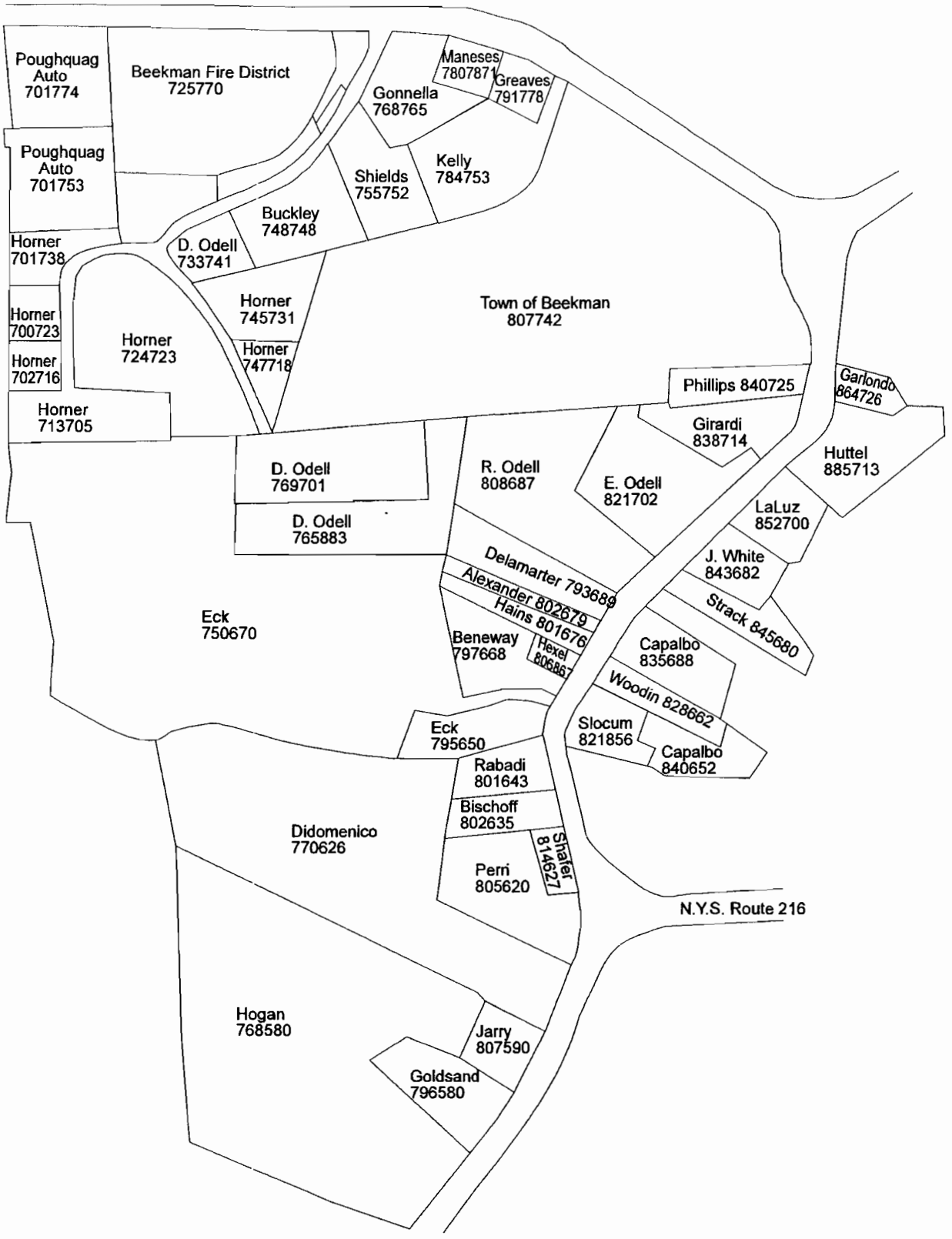
CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 6	
Prepared By:	NSS 10/00
Reviewed By:	JAC 10/00
Revised By:	NSS 10/00
Approved By:	JAC 10/00

PROPOSED SOIL EXCAVATION AREA

BEEKMAN HIGHWAY GARAGE
BEEKMAN, NY
TB000010

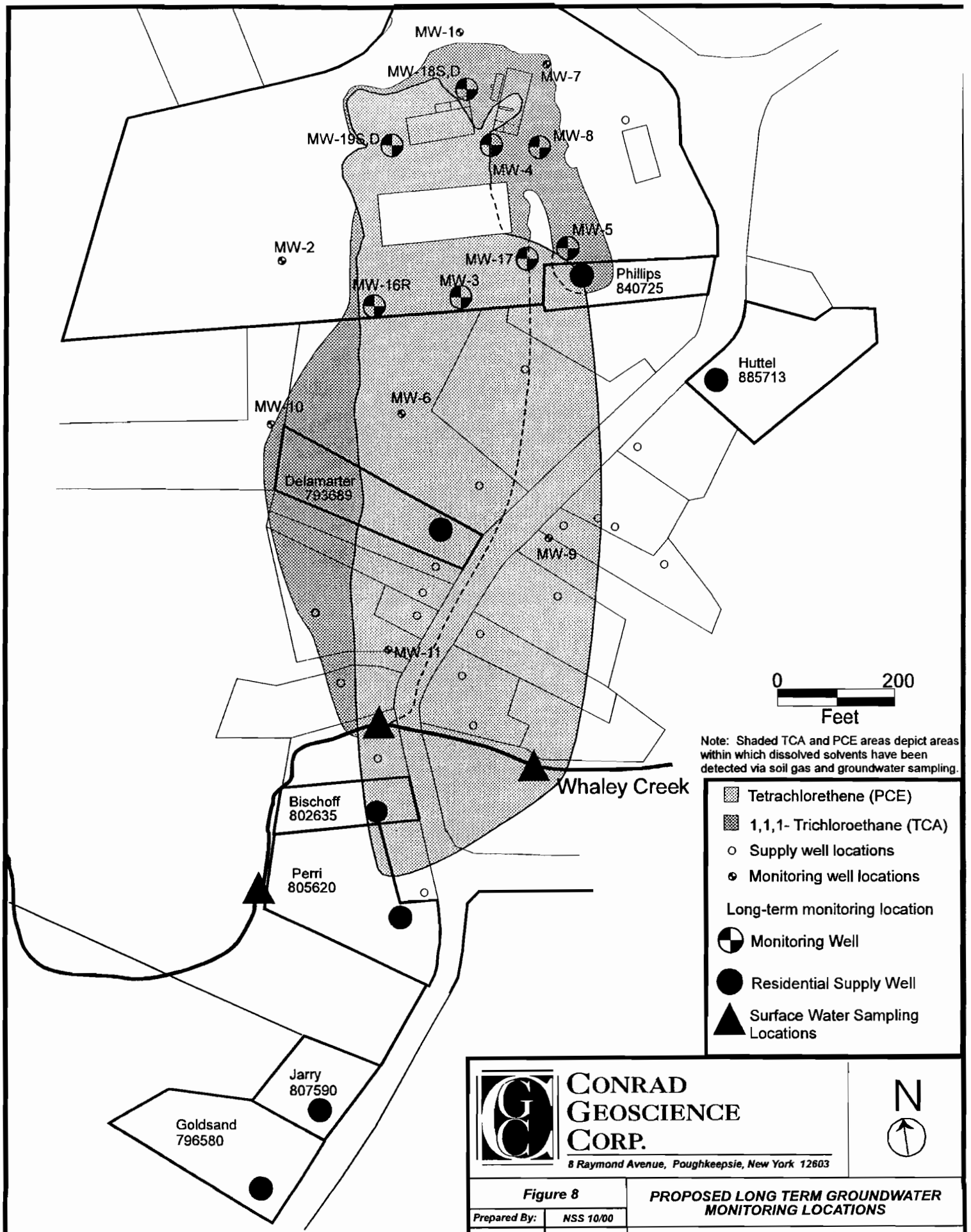

MW-1
MW-18S & MW-18D
MW-7
BLOCK GARAGE
POLE BARN
MW-19S & MW-19D
MW-4
MW-8
(Supply Well)
TOWN HALL
SALT SHED
MW-2
MW-17
MW-5
0
60
Feet
MW-16
MW-3
(Supply Well)
N
CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603
Figure 4
BTEX DISTRIBUTION
Prepared By: NSS 10/00
Reviewed By: JAC 10/00
Revised By: NSS 10/00
Approved By: JAC 10/00
BEEKMAN HIGHWAY GARAGE
BEEKMAN, NY
TB000010
BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES (BTEX) PLUME
HIGHEST CONCENTRATIONS OF BTEX COMPOUNDS
Note: Shaded TCA and PCE areas depict areas within which dissolved solvents have been detected via soil gas and groundwater sampling.
Source: Groundwater quality data and soil gas data as reported in Remedial Investigation (RI) Report, March 1998



CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

N

Figure 7		Poughquag Hamlet Property
Prepared By:	NSS 10/00	
Reviewed By:	JAC 10/00	
Revised By:	NSS 10/00	TB000010
Approved By:	JAC 10/00	



Source: Groundwater quality data and soil gas data as reported in Remedial Investigation (RI) Report, March 1998

CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 8	
Prepared By:	NSS 10/00
Reviewed By:	JAC 10/00
Revised By:	NSS 10/00
Approved By:	JAC 10/00

PROPOSED LONG TERM GROUNDWATER MONITORING LOCATIONS

Beekman Highway Garage
Poughquag, New York
TB000010

APPENDIX B:
TABLES

Table 1. Concentrations of TCA and PCE in Residential Wells as of May 3, 1999
Beekman Town Garage TB000010

Name	Date	Well Depth (feet)	TCA (ppb)	PCE (ppb)	BTEX (ppb)
Alexander-Prall	04/92	80	25	ND	ND
	06/92	80	31	ND	ND
	08/92	80	30	ND	ND
	03/94	80	54	ND	ND
	11-94	80	34	ND	ND
Capalbo	06/92	15	37	ND	ND
	11/94	15	ND	ND	ND
Delamarter	04/92	3.5	15	ND	ND
	05/92	3.5	200	-	ND
	06/92	3.5	120	ND	ND
	11/94	3.5	27	0.5	ND
Garlando	04/93	NA	0.8	-	-
Hains-Valez	07/92	NA	170	-	-
	08/92	NA	90	-	-
Hexel	07/92	NA	76	-	-
	09/92	NA	90	-	-
Huttel	08/92	NA	ND	-	ND
	04/93	NA	ND	-	-
	09/94	NA	ND	ND	ND
	04/99	NA	ND	ND	208.9*
Eck	07/92	400	-	3.0	ND
R. O'Dell	07/92	6	43	NA	ND
	08/92	6	25	-	ND

Name	Date	Well Depth (feet)	TCA (ppb)	PCE (ppb)	BTEX (ppb)
	03/93	6	19	ND	ND
	11/94	6	10	0.7	ND
Perri	09/94	200	ND	ND	ND
	11/94	200	ND	ND	ND
Phillips	07/92	94	ND	1.6	ND
	08/92	94	ND	2	ND
	03/93	94	ND	ND	ND
	09/94	94	ND	0.5	ND
	11/94	94	ND	ND	ND
Rabadi	06/92	80	20	-	ND
	08/92	80	16	-	ND
	03/94	80	39	ND	ND
Strack	05/92	NA	ND	-	ND
	09/92	NA	ND	-	ND
	04/93	NA	1.7	-	ND
	09/94	NA	0.7	ND	ND
	11/94	NA	0.7	ND	ND
Bischoff	03/92	90	3.9	-	ND
	06/92	90	ND	ND	ND
	07/92	90	1.0	-	ND
	08/92	90	2.1	-	ND
	01/93	90	3.8	-	ND
	09/94	90	6.1	ND	ND
	11/94	90	4.0	ND	ND
Woodin	06/92	NA	5	ND	ND

Notes:
USEPA Method 8260 STARS;
All concentrations are in ppb (ug/Lg) unless otherwise indicated;
ND=Not detected;
(-) - indicate no analysis;
NA = Records not available
Data for the previous tables can found in the R.I. Report, March 1998;
*Data from LMS report, May 3, 1999

Table 2. Concentrations of PCE, TCA, BTEX, and Total VOCs in Monitoring Wells on Town Property as of December 2, 1998
Beekman Town Garage TB000010

Well Number	Date	Well Depth (feet)	PCE (ppb)	TCA (ppb)	BTEX (ppb)	Total VOCs (ppb)
MW-1	10/97	25.4	ND	ND	ND	1
MW-2	11/94	26.1	ND	ND	ND	0
MW-3	11/94	23.3	0.7	ND	ND	1.3
	10/97	-	ND	ND	ND	7
MW-4	11/94	22.6	63	ND	ND	63
	10/97	-	91	ND	ND	93
MW-5	10/97	24.0	ND	ND	11	146
MW-7	10/97	19.0	ND	3	1	11
MW-8	11/94	17.5	250	ND	36	559
	10/97	-	68	ND	ND	72
MW-16	10/97	24.5	ND	ND	11	13
MW-17	12/94	22.7	ND	ND	3.3	21.8
	10/97	-	19	ND	ND	24
MW-18s	10/97	20.0	440	ND	ND	590
	12/98	-	336.8	ND	1.2	338
MW-18d	10/97	55.0	ND	ND	ND	16
MW-19s	10/97	24.0	ND	ND	ND	6
MW-19d	10/97	63.3	ND	ND	43	62

Notes:
USEPA Method 8260 STARS;
All concentrations are in ppb (ug/Lg) unless otherwise indicated;
ND=Not detected;
(-) - indicate no analysis;
NA = Records not available
Data for the previous tables can found in the R.I. Report, March 1998;

APPENDIX C:
HEALTH AND SAFETY PLAN

Health and Safety Plan

BEEKMAN HIGHWAY GARAGE

NYSDEC Site # 3-14-094

Conrad Geoscience Corp. File #TB000010

October 2000

Prepared for:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561

Prepared by:

Conrad Geoscience Corp.
8 Raymond Ave.
Poughkeepsie, New York 12603

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SITE-SPECIFIC HEALTH AND SAFETY PLAN
TOWN OF BEEKMAN HIGHWAY GARAGE

1.0 EXECUTIVE SUMMARY

Site Name: Town of Beekman Highway Garage

Location: County Route 7 and Beekman-Poughquag Road, Poughquag, New York

Task Description: Soil excavation; soil and groundwater sample collection

Project Advisor: John Conrad

Plan prepared by: Christopher Brown
Preparation date: November 8, 2000
Plan reviewed by: John Conrad

Project Manager and On-Site Health & Safety Coordinator: Christopher Brown

Level of Existing Site Information: Preliminary Site Assessment, RI/FS completed

EMERGENCY SERVICES & TELEPHONE NUMBERS

Location	Emergency Telephone
Beekman Town Hall	845/724-5300 ****LOCATED ON-SITE****
Beekman Highway Garage	845/724-5013 ****LOCATED ON-SITE****
Saint Francis Hospital	845/471-2000
Ambulance Service	Dial 911
Fire Department	845/471-1333; 471-1414
Sheriff's Office	845/452-0400 ****LOCATED ON-SITE****
State Police	845/298-0398
Poison Control Center	800/336-6997

ROUTE TO HOSPITAL:

From the site proceed west to State Route 55.
Continue west on Route 55 until the intersection of Routes 55 and 44.
Continue west on Route 44/55 until Washington Street in the City of Poughkeepsie.
Continue north on Washington Street to North Road. Hospital is on right-hand side.

BRIEF SITE HISTORY

A Preliminary Site Assessment (PSA) was conducted in 1995. The subject property was listed on the NYS registry of Inactive Hazardous Waste Sites based on the findings of this PSA. Several VOCs have been detected in down-gradient supply wells at concentrations exceeding NYSDEC standards. A Remedial Investigation and Feasibility Study (RI/FS) have been completed at the site. Based on the NYSDEC PRAP and ROD, the area to be remediated consists of soil at the former refueling facility at the Beekman Town Highway Garage. On-site and off-site groundwater quality requires monitoring.

PLANNED SITE ACTIVITIES

Remediation will consist of soil excavation and off-site disposal. Groundwater samples will be collected from monitoring wells and residential taps.

HAZARD IDENTIFICATION

CHEMICAL HAZARDS

- Volatile organic compounds (VOCs), including BTEX compounds; 1,1,1-TCE; trichloroethylene; and tetrachloroethylene have been detected in on-site soil and groundwater at elevated concentrations.

- Some of these compounds are known carcinogens and are threatening to human health if prolonged exposure and direct contact are not avoided. Precautions will be taken by all personnel to monitor the concentrations of VOCs in air, to employ measures as appropriate to reduce exposure, and to wear respiratory and dermal protection as appropriate.

- Smoking is strictly prohibited while on site. See Table I for a complete description of threshold values and contaminants of concern.

- Because the concentrations of contaminants to which site workers will be exposed is unknown at this time we will assume Level D personal protective equipment (PPE). If ambient air conditions repeatedly exceed the PEL for any of these compounds site workers will upgrade to Level C PPE. Section 7.0 on page 10 describes the complete monitoring program.

PHYSICAL HAZARDS

Heavy Equipment

- Heavy equipment will be operating during soil removal.

- Precautions will include but should not be limited to: hard hat; steel-toed and steel-shanked boots; bending at the knees, not the waist, having assistance to move heavy objects; and maintaining safe working distances from free moving equipment on machinery and backhoes.

Utility Lines

- Local utility companies will be contacted via the One-Call alert system and are responsible for marking out utility lines leading to the subject property.

- Conrad Geoscience personnel will consult site personnel as to the location of any electrical lines, telephone lines or other utilities prior to sample collection.

Extreme Temperatures

- Proposed field activities will be conducted during months when ambient air temperatures register between approximately 40 and 80 degrees Fahrenheit.

- Prolonged exposure to high temperatures may result in heat stress, which can include dehydration, headache, dizziness, and fainting. All personnel will take precautions to avoid heat exhaustion by consuming sufficient amounts of water and taking breaks as needed. Particular attention will be paid to personnel operating in Level C PPE.

Noise

- Hearing protection will be worn by all field personnel working in noisy environments (when a conversation between two individuals standing within three feet of each other cannot be conducted without shouting).

PERSONAL PROTECTIVE EQUIPMENT /PROTECTION PROCEDURES

Protective procedures shall include:

- Level D PPE for excavating and sampling activities.
- Ambient air will be continuosly monitored for VOCs with a photoionization detector (PID).
- Down-wind perimeter air monitoring will begin if VOCs exceed the action level in the work zone. If perimeter monitoring indicates VOCs in the air, work must stop and the method of excavation must be re-evaluated.
- PPE will be upgraded to level C if such monitoring reveals an exceedance for the action level or an exceedance in the STEL-C for any of the contaminants of concern.
- Level C PPE will be worn for sampling inside any semi confined spaces as deemed necessary by the on-site health and safety officer.
- Level C PPE includes a full-face air purifying respirator, one-piece tyvek suit, chemical resistant gloves, and chemical resistant boots, hard hat and steel-toed boots.

DECONTAMINATION PROCEDURES

All sampling equipment will be thoroughly decontaminated prior to use. The decontamination procedure shall include the following: alconox and water wash; deionized water rinse; methanol rinse; and a final deionized water rinse. All cleaned equipment will be wrapped and stored in clean plastic sheeting or aluminum foil. A more detailed description of Conrad Geoscience's decontamination procedures is appended in the Standard Operating Procedures.

EMERGENCY PROCEDURES

In the event of an emergency (i.e., injury, fire, or spill), the site safety officer will immediately cease all on-site activities. All emergency response procedures shall be coordinated and directed by the Health and Safety Manager (HSM).

The route to the nearest hospital is identified on the following page. This route will be discussed with all members of the field crew on the first day on-site. (Route maps will be placed in all field vehicles.) If the site safety officer determines that ambulance services are necessary, he or she will contact the service.

In event of overt personal exposure (skin contact, inhalation, ingestion) or personal injury, all activities will cease and appropriate action will be taken (e.g., administering first aid, contacting appropriate emergency medical facility).

In event of potential or actual fire or explosion, all activities will cease, all personnel should move to a safe distance from the involved area and the fire department should be alerted.

AUTHORIZED TEAM PERSONNEL

In addition to Beekman Highway Department personnel who will be involved in excavating and loading soil on-site, Conrad Geoscience Corp. will have the following employees on site.

Conrad Geoscience Personnel	Position
John Conrad	Senior Hydrogeologist
Christopher Brown	Hydrogeologist
Nicholas Sturdivant	Field Technician

NEAREST PHONE LOCATION

A phone is located in the Town Hall, the Highway Pole Barn, and in the County Sheriff Substation in the southern end of the Highway Block Garage. A mobile phone will be located in the Conrad Geoscience field vehicle.

2.0 HEALTH AND SAFETY PLAN

2.1 Purpose of Project

Complete the Remedial Design and Construction - Source Removal - as presented in the 1999 NYSDEC issued Record of Decision. Complete groundwater sample collection.

2.2 Purpose and Scope of the Health and Safety Plan

The purpose of this plan is to ensure health and safety during the Remedial Design and Construction to be conducted by Conrad Geoscience. This Health and Safety Plan covers any Conrad Geoscience employees, and its subcontractors, who enter the Restricted Zone. Visitors to the Beekman site shall also be subject to the requirements of this plan.

2.3 Restricted Zone Entry

The Restricted Zone may be entered by Conrad Geoscience personnel and excavation workers. Other personnel may enter the Restricted Zone after being approved by the Health and Safety Manager (HSM), or his/her designee. Anyone entering the Restricted Zone must be in appropriate level of protection as designated by the HSM.

3.0 KEY HEALTH AND SAFETY PERSONNEL/IDENTIFICATION AND RESPONSIBILITIES

The following subsections briefly describe the health and safety designations and general responsibilities for those who will be employed in the Beekman Project.

3.1 Designations of Personnel

Health and Safety Manager (HSM):	Christopher Brown
Site Project Manager (PM):	Christopher Brown
Other Site Staff	John Conrad, Project Director Nicholas Sturdivant , Field Technician

3.2 General Responsibilities

General responsibilities of Health and Safety Personnel:

3.2.1 Health and Safety Manager (HSM)

The Health and Safety Manager, Christopher Brown, has overall responsibility for implementation of the policies and procedures of this plan, provides technical and management consultation to Site Management, and has the final authority to resolve all health and safety issues. The HSM shall also conduct the initial site specific training on-site and provide regular support for all health and safety activities, including upgrading or downgrading the level of personal protection, as needed.

The HSM may delegate the implementation and enforcement of the plan to other on-site personnel.

3.2.3 Project Manager

The PM will be responsible for conducting field work and for assuring that the work is conducted in accordance with the requirements of contract documents. The PM is on-site for the duration of the Beekman Project and will manage all day-to-day activities of all parties of this project.

3.3 Emergency Contact Telephone Numbers

Hospital - St. Francis Hospital - Emergency Room	845/438-8220
Saint Francis Hospital	845/471-2000
Ambulance Service	Dial 911
Fire Department	845/471-1333; 471-1414
Sheriff's Office	845/452-0400 **LOCATED ON-SITE**
State Police	845/298-0398
Poison Control Center	800/336-6997
NTL Capitol Poison Control Center	1-800-625-3333
US EPA - Region II	1-800-457-7362
NY DEC - Spill Hotline	1-800-457-7362
NY DEC - New Paltz Regional Office	1-845-256-3600

4.0 HASP SPECIAL CONDITIONS

The subject property is an operating highway garage. General highway operations may be continuing during field investigations and precautions regarding general truck traffic should be taken.

5.0 HAZARD IDENTIFICATION AND ANALYSIS

5.1 Identification of Potential Health Hazards

Potential hazards which are most likely to be encountered during the field operations include:

5.1.1 Chemical Hazards

Based on the findings of the PSA and RI, the potential for exposure to the following contaminants exists at the site: volatile organic compounds (VOCs), and petroleum hydrocarbons (see Table I Chemicals of Concern).

5.1.2 Heat Stress

Depending on weather conditions and on the level of protection required, the HSM or designee will be prepared to institute appropriate monitoring for Heat Stress should conditions warrant such monitoring.

5.1.3 Ultraviolet Radiation

Exposure to ultraviolet radiation from sunlight or from other sources such as arc welding is also considered a potential hazard to project field team members. Appropriate eyewear should be available if any welding is performed.

5.1.4 Biological Hazards

The location of the site is such that a variety of biological hazards may exist. These hazards include but are not limited to, snakes and ticks. Appropriate precautions must be taken to mitigate these risks.

5.1.5 Noise

High noise levels generated by heavy equipment and machinery can cause noise-induced hearing loss or impairment. Noise levels will be measured during drilling and excavation operations to determine the need for hearing protection.

5.1.6 Excavation Activities

Excavation/filling/backfilling of the former refueling area. Other activities associated with this task include could include drainage control, foundation protection, sheeting, and shoring, as necessary.

Health Hazards

Potential for exposure to surface and subsurface toxic contaminants via inhalation, dermal absorption or ingestion. Excessive noise and UV radiation.

Safety Hazards

Excavation and backfilling pose potential hazards common to heavy equipment use around trenches. Sheeting and shoring techniques to prevent cave-ins, collapse, engulfment, entrapment, or other related conditions will be practiced, as necessary, and continuously monitored by site personnel. Potential for falls will require use of fall arrest protection. Potential

for explosive and/or oxygen deficient atmosphere in trenches.

Initial Level of Protection And Monitoring Equipment

Level D. Portable PID. Level C will be on standby.

6.0 SAFE WORK SITE PROCEDURES

Workers are expected to adhere to established safe work practices for their respective specialties. The need to exercise caution in the performance of specific work tasks is made more acute due to:

A. physical, chemical, toxicological, and radiological properties of contaminated material possibly present;
B. other types of hazards present, such as heavy equipment, falling objects, loss of balance or tripping;
C. weather restrictions;
D. restricted mobility and reduced peripheral vision caused by the protective gear itself;
E. the need to maintain the integrity of the protective gear; and
F. the increased difficulty in communicating caused by respirators.

Work at the site will be conducted according to established protocols and guidelines for safety and health of all involved.

6.1 General

In any unknown situation, always assume the worst conditions and plan operations accordingly. Because no personal protective equipment is 100% effective, all personnel must minimize contact with cuttings or contaminated materials. Plan work areas, decontamination areas, and procedures accordingly.

Smoking, eating, chewing, or drinking in the work area will not be allowed. Oral ingestion of contaminants is the second most likely means of introducing toxic substances into the body (inhalation is the first).

Avoid heat and work stresses related to wearing PPE. Work breaks should be planned and frequent to prevent stress related accidents or fatigue.

Personnel must be aware of not only one's own immediate surroundings, but also that of others. Extra precautions are necessary when working near drilling rigs and other heavy machinery, especially due to the sight and hearing limitations caused by both PPE and loud machinery. Keep

all hands, appendages and loose clothing far from moving parts on all machinery.

6.2 Excavation Equipment Safety

- Proper loading and operation of trucks on-site shall be maintained in accordance with DOT requirements covering such items as grounding, placarding, driver qualifications and the use of wheel locks.
- Operation of heavy equipment shall be in accordance with OSHA regulations 29CFR 1910 and 1926.
- All equipment that is brought on-site will be available for inspection.
- The HSM or designee, will assign protective equipment to all site personnel and this equipment will be made available for inspection.
- All equipment shall be installed with appropriate equipment guards and engineering controls. These include rollover protective structures.
- Safe distances will be maintained when working around heavy equipment.
- All equipment and tools to be operated in a potentially explosive environment must be intrinsically safe and not capable of sparking or be pneumatically or hydraulically driven.
- Cutting or welding operations shall not be carried out without approval from the Project Manager.
- At the start of each workday, inspection of breaks, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, and splash protection shall be made by the equipment operators.
- All non-essential people shall be kept out of the work area.
- Dust control measures shall be employed to prevent the movement of dusts from contaminated areas to clean areas. The method employed shall be determined by Conrad Geoscience.
- Equipment operators shall report to their supervisor(s) any abnormalities such as equipment failure, oozing liquids, unusual odors, etc.
- Refueling shall be done in safe areas. Rigs and equipment shall be turned off prior to refueling.
- All blades and buckets shall be lowered to the ground and parking breaks set before turning off vehicles.

7.0 AIR MONITORING

7.1 General

Air monitoring will be conducted continuously by the HSM or other designated site personnel by using direct reading air monitoring equipment. A PID will be the primary instrument for air monitoring. QA/QC control of this instrument will be provided through appropriate calibration as outlined in the operation manual.

7.2 Action Levels/Stop Work Protocol

The information collected by air monitoring instruments and/or visual observation will require action to stop operations and/or upgrade to a higher level of protection. Any action requiring field work to stop will require notification of the PM, or designee. The levels and protocol are designed to minimize, the to the extent possible, health and safety risks greater than the level of protection being used (Table II). Airborne particulate protocol will be developed by the PM should air sampling be initiated.

7.3 Perimeter or Site Boundary Air Monitoring

Air monitoring of the site perimeter will be performed if levels of air contaminants exceed normal background in the work area (ie., downwind of drilling/excavating), or as deemed necessary by the PM.

7.4 Action Levels

PID - Taken in the Breathing Zone - sustained for 15 seconds

Background (BG)	=Level D
1-50 units above BG	=Level D
50 - 100 units above BG	=Level C
Above 100 units (Sustained for 2 minutes)	= Stop work (SHS/IHT will determine if on-site activities will continue in Level C or remain shut down)
100 to 250 units (Sustained for 2 minutes)	= Stop work (SHS/IHT will determine if on-site activities will continue in Level C or remain shut down)
Above 250 units (Sustained for 2 minutes)	= Stop work (SHS/IHT will determine if on-site activities will go to Level B or remain shut down)

8.0 EMPLOYEE TRAINING AND MEDICAL SURVEILLANCE

8.1 Employee Training and Medical Surveillance

All project team members must receive initial site specific health and safety training in accordance with all applicable OSHA regulations. Any other personnel visiting the site must check in with the SHS/IHT, or designee, for orientation and briefing of site hazards. All project team members must have satisfactorily completed a comprehensive physical examination within the past 18 months.

8.2 HASP Review

All project team members will have read the Health and Safety Plan and will indicate their understanding to the SHS/IHT and the HSM as well as the PM.

9.0 EMERGENCY RESPONSE PLAN

9.1 Emergency Procedure

In the event of an emergency requiring off-site assistance the appropriate service will be called and the following information will be relayed to the dispatcher:

A Location of emergency:**Beekman Highway Garage, County Route 7, Poughquag, Town of Beekman, New York**

B Nature of emergency:

1. If fire what kind and what equipment was involved

2. If medical,

-# of injured persons
-nature of injuries
-what medical services are required

9.2 Personal Exposures

Eye exposure - treat by immediate flushing with distilled water for 15 minutes. Transport for examination and treatment.

Skin Exposure - remove contaminated clothing and treat by washing with waterless hand cleaner and paper towels followed by Alconox and water.

Inhalation - if a person inhales a large amount of organic vapor, the person will be removed from the work area to fresh air and artificial respiration will be administered if breathing has ceased. The affected person will be transported to St. Francis Hospital if overexposure to lungs has occurred. A map depicting the route to the hospital is appended.

Physical Injures - in case of a physical injury, the victim may receive emergency first aid at the site, as appropriate, and, if necessary, will be transported by ambulance or emergency vehicle to St. Francis Hospital. An accident form must be completed and kept on file at Conrad Geoscience.

TABLE I

CHEMICALS OF CONCERN

Gas/Vapor Hazards	OSHA Permissible Exposure Limit (PEL's)			ACGIH Threshold Limit Values (TLV's)		Acute Symptoms	Target Organs	Known or Suspected Human Carcinogen
	TWA (ppm)	STEL (ppm)	Ceiling (ppm)	TLV-TWA (ppm)	TLV-STEL (ppm)			
Benzene IDLH = 500 ppm	1	5	25	10	-	Eye and nose irritation, nausea, headache , fatigue	Blood, skin, eyes, respiratory system	Yes
Ethylbenzene IDLH = 800 ppm	100	125	-	100	125	Eye irritation, coma, headache, dermatitis, narcosis	Skin, eyes, CNS, upper respiratory	Yes
Tetrachloroethylene (PCE) IDLH = 150 ppm	100	-	-	25	100	Eye, nose and throat irritation, nausea, flush face, dizziness	Liver, kidneys, eyes, CNS, upper respiratory system	Yes
1,1,1 Trichloroethane IDLH = 700 ppm	350	450	-	350	450	Headache, lassitude, eye irritation, dermatitis	Skin, CNS, CVS, eyes, liver, kidneys	Yes
Trichloroethylene IDLH = 1000 ppm	50	200	-	50	100	Headache, vertigo, nausea, tremors, vomiting, eye irritation	Respiratory system, heart, liver, CNS, skin	Yes
Xylenes IDLH = 900	100	150	-	100	150	Dizziness, drowsiness, eye, nose & throat, irritation, nausea	Blood, lungs, CVS, kidneys	No

CNS = Central Nervous System
CVS = Cardiovascular System

TABLE II

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Level of Work Task	Level of Protection*	Specific PPE **
Restricted Zone/ Support Zone Operations	D	Work clothes, hard hat, safety glasses with side shields, steel toed boots or shoes.
Excavation, Drilling/Sampling/Air Monitoring Outside Exclusion Zone	D and C	Same as above but with PE Tyvek, coverall, nitrile gloves, rubber boots, full face air purifying respirators with organic vapor/HEPA cartridges.
Excavation, Drilling/Sampling/Air Monitoring Outside Exclusion Zone	D and C	Same as above

* Level of protection may be modified by HSM/SHS dependant upon air monitoring and visual observations

** Specific combinations of PPE will be determined by the HSM/SHS and will depend upon specific job assignment of worker. Proper use of respiratory protection, including mask cleaning, disinfection and maintenance, will be enforced. All "used" clothing will be disposed of in accordance with Conrad Geoscience instructions

Citizen Participation Plan

BEEKMAN HIGHWAY GARAGE

NYSDEC Site # 3-14-094

Conrad Geoscience Corp. File #TB000010

October 2000

Prepared for:

New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, New York 12561

Prepared by:

Conrad Geoscience Corp.
8 Raymond Ave.
Poughkeepsie, New York 12603

TABLE OF CONTENTS

INTRODUCTION AND OVERVIEW OF CITIZEN PARTICIPATION (CP)

Citizen Participation is defined by the NYSDEC as a program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and the government agencies responsible for investigation and remediating them. NYSDEC, NYSDOH, and the Town of Beekman are committed to keeping the public informed throughout the process of remediating the Town garage site.

Site Background

The Remedial Design/Remedial Action (RD/RA) Report for the Town of Beekman Highway Garage inactive hazardous waste disposal site complies with remediation requirements as expressed in the NYSDEC Proposed Remedial Action Plan (PRAP) and the Record of Decision (ROD).

Volatile organic compounds (VOCs) in groundwater have been shown to originate from three primary locations on Highway property. The chlorinated solvent 1,1,1-trichloroethane (TCA) was originally discharged near the western end of the Highway pole barn. The chlorinated solvent perchloroethylene (PCE) was originally discharged near the northernmost corner of the pole barn. So-called "BTEX" compounds (benzene, toluene, ethylbenzene, and xylene), which are primary constituents of gasoline and diesel fuel, are present in both soil and groundwater because of fuel leakage from underground storage tanks (USTs) near the eastern end of the salt barn.

The New York Department of Environmental Conservation (NYSDEC) requires either: 1) Excavation and removal of contaminated soil at the former UST area; or 2) Installation of a soil vapor extraction system to extract contaminants from the soil in the unsaturated zone at the former UST area. Of these two options, the Town of Beekman elects to excavate and dispose of approximately 570 cubic yards of petroleum-contaminated soil from the former fuel UST area. The NYSDEC recommends no remediation of groundwater, and is instead requiring that VOCs in groundwater be monitored annually by collecting and analyzing samples of groundwater from existing on-site and off-site wells. Natural processes will, according to the NYSDEC, result in adequate attenuation of solvents and fuel constituents in groundwater. The NYSDEC also requires on round of water quality monitoring for Whaley Creek.

The selected remedy outlined includes three main tasks: 1) Excavation and disposal of petroleum-contaminated soil in the former refueling area where gasoline and diesel leaked from USTs prior to their removal; 2) Annual collection and analysis of groundwater samples from ten existing on-site monitoring wells and five off-site residential wells; and 3) One time collection and analysis of water samples from Whaley Creek.

Project Description

According to the Focused Feasibility Study (FFS) report (LMS, 1999), approximately 410 yd^3 of petroleum-contaminated soil are present in the former underground storage tank (UST) area near the northeastern corner of the salt barn (Figure 5 & 6). Contaminants in this area include the petroleum constituents benzene, toluene, ethylbenzene, and xylene (BTEX). The chlorinated solvent perchloroethylene (PCE), which is not a fuel constituent, is also present.

Soil will be removed from the area depicted in Figure 6 using an excavator. Soil will be removed to a depth of approximately 12 feet, the anticipated depth of the top of the saturated zone (water table). A photoionization detector (PID) will be used to screen soil in the field for VOCs using headspace techniques. Soil samples will be sealed in plastic bags, and a PID reading for the headspace in each bag will be recorded. Excavated soil will be temporarily stockpiled on-site in an area designated by the Highway Department.

All excavated soil will be stockpiled on 6-mil polyethylene sheeting pending receipt of laboratory reports for soil samples. Soil stockpiled will be covered with 6-mil polyethlene sheeting to prevent soil from washing onto the ground.

A minimum of twenty soil samples from the excavation will be collected for laboratory analysis, which will be collected from the bottom and sidewalls of the excavation in order to document the condition of soil remaining in the ground at the conclusion of the soil removal program. A minimum of seven soil samples will be analyzed for every 60 cubic yards of soil excavated.

On-site monitoring wells selected for inclusion in the groundwater monitoring program include: MW-3, MW-4, MW-5, MW-8, MW-16, MW-17, MW18S, MW-18D, MW-19S, and MW-19D (Figure 8). The five off-site monitoring wells selected for inclusion in the groundwater monitoring program are: Tax log #840725 (Phillips); #793689 (Delamarter); #802635 (Bischoff); #805620 (Perri); #885713 (Huttel); #807590 (Jarry); and #796580 (Goldsand).

One grab sample will be collected from a section of Whaley Creek believed to be upstream of its intersection with the solvent plume. Two samples will be collected from sections of the stream believed to intersect the solvent plume.

CITIZEN PARTICIPATION ACTIVITIES

As required by 6NYCRR Part 375-1.5, this Citizen Participation Plan (CPP) includes the following:

1. A plan that details the citizen participation activities that will be implemented for the site.

2. A list of government representatives, civic organizations, environmental groups, residents, media representatives, and other individuals and groups that have expressed an interest in, or are affected by, the site or the site's program (the Contact List).

3. Site-specific document repositories in the regional office of the NYSDEC in which the site is located, and in a publicly accessible building located near the site (Town Hall).

4. A mailing to those named on the aforementioned Contact List announcing the availability of the final draft remedial investigation/feasibility study workplan and a notice and brief analysis of the proposed investigation.

In addition to the status reports submitted to the Town by Conrad Geoscience, and any technical presentations the consultant may make to the Town Board during the remediation process, the following additional CP activities will be undertaken:

1.01 Review and update the site's mailing list as necessary.

1.02 Place the Draft Remedial Design/Remedial Action Plan in the Document repositories.

1.03 Prepare and mail a Fact Sheet describing the Remedial Design as well as the planned start date for soil evacuation.

1.04 Prepare and mail a Fact Sheet to be sent to the site's mailing list when excavation is completed and the soil removed.

Project Mailing List

Adjacent/Nearby Affected Parties

Residences adjacent to the site include the following:

Mr & Mrs Douglas O'Dell	P.O. Box 610, Poughquag, NY 12570	914/724-3393
Raymond & Claire O'Dell	P.O. Box 395, RD#2, Main Street, Poughquag, NY	914/724-5979
Ella O'Dell	P.O. Box 397, RD#2, Main Street, Poughquag, NY	914/724-5920
John & Martha Girardi	Box 405A, Main Street, Poughquag, NY	914/724-5507
Robert Phillips	RR#2, Box 403, Poughquag, N.Y.	914/724-5000

Full Project Mailing List

Andrew Webb	Clapp Hill Road Lagrangeville, NY, 12540
Al Klauss NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Alfred Mackay	5 Coon Den Road Hopewell Junction, NY, 12533
Alfred & Cynthia Dussel	1273 Route 216 Poughquag, NY, 12572
Anthony & Denise McKee	RR 2 Box 220 Clap Hill Road Lagrangeville, NY, 12540
Barbara Heffler	12 Martin Road Lagrangeville, NY, 12540
Barbara Kendall,	Dutchess Env. Management Con, POB 259 Millbrook, NY, 12545
Barbara McLain	3203 Chelsea Cove Hopewell Junction, NY, 12533
Barbara & Jim Alexander	987 Monroe Turnpike Monroe, CT, 06468
Barbara E, Harvey	18 Juniper Lane Pawling, NY, 12564-1501
Beverly de Ramone	Griffen Street Poughquag, NY, 12570
Bill Calogero	Andrews Road Lagrangeville, NY, 12540
Blanche Garlando	POB 743 Poughquag, NY, 12572
Bob Kendall	4 Baker Road Hopewell Junction, NY, 12533
Bob Weeks	107 Blanche Merrill, NY, 12955
Bradford Kendall	22 Market Street Poughkeepsie, NY, 12601
Brian Greaves	RR 1 Box 307 Poughquag, NY, 12570
Bruce & Rose Barton	RR 4 Box 297B Poughquag, NY, 12570
Carl Mariconti	84 Livingston Ave Pittsfield, MA, 01201-7043
Carolyn Perri	Main Street Poughquag, NY, 12570
Cesare Manfredi,NYSDEC	200 White Plains Road Tarrytown, NY, 10591-5805
Charles & Jean Hutel	RD 2 Box 402 Poughquag, NY, 12570
Chris Fish	44 Bryant Street Poughquag, NY, 12570
Chris Sproat	Dorn Road Lagrangeville, NY, 12540
Christine Nelson	POB 414 Poughkeepsie, NY, 12602
City Editor	S. Dutchess News 84 E. Main St, Wappingers Falls, NY 12590
City Editor	Poughkeepsie Journal POB 1231 Poughkeepsie, NY, 12602
City Editor	Harlem Valley Times POB H Amenia, NY, 12501
City Editor	Hyde Park Townsman POB 227 Rhinebeck, NY, 12572
City Editor	The Millerton News POB 1688 Lakeville, CT, 06039
City Editor	Millbrook Round Table POB 316 Millbrook, NY, 12545
City Editor	Gazette Advertiser POB 227 Rhinebeck, NY, 12572
City Editor	Voice Ledger POB 316 Millbrook, NY, 12545
City Editor	Pine Plains Register Herald POB 316 Millbrook, NY, 12545
City Editor	Pawling News Chronicle 3 Memorial Drive Pawling, NY, 12564
City Editor	Taconic Newspapers POBox 316 Millbrook, NY, 12545
City Editor	Poughkeepsie Beat 1 Garden Street Poughkeepsie, NY, 12601
City Editor	Beacon Free Press 84 E. Main Street Wappingers Falls, NY, 12590

Congressman John Sweeney US House of Representatives Washington, DC, 20515
Congressman Maurice Hinchey,291 Wall Street Kingston, NY, 12401
Congresswoman Sue Kelly House Office Building 1222 Longworth Washington, DC, 20515
Conrad Geoscience 8 Raymond Ave Poughkeepsie, NY, 12603
Conrad Link 350 Old Route 55 Poughquag, NY, 12570
Councilman James Sproat Dorn Road Lagrangeville, NY, 12540
Councilman David Kelly 41 Overlook Drive Pawling, NY, 12564-2011
Councilman Earl J. Lauria 4 Main Street Poughquag, NY, 12570
Councilman Peter Barton 4 Main Street Poughquag, NY, 12570
Councilwoman Patricia Campanaro 4 Main Street Poughquag, NY, 12570
Councilwoman Stephanie Goldberg 4 Main Street Poughquag, NY, 12570
County Clerk 22 Market Street Poughkeepsie, NY, 12601
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Deborah Jarry RR 1 Box 3 Route 216 Poughquag, NY, 12570
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Al Klauss,NYSDEC 21 S. Putt Corners Road New Paltz, NY, 12561
Douglas O'Dell Jr. Carey Road POB 211 Poughquag, NY, 12570
Dr. & Mrs. Duane W. Smith 30 Underhill Road Poughquag, NY, 12570
Earl Buckley POB 665 Poughquag, NY, 12570
Earl Lauria Stowe Drive Poughquag, NY, 12570
Ella O'Dell RR 3 Box 395 Poughquag, NY, 12570
Ellen Rahilly RR1 Box 373 Poughquag, NY, 12570
Ellen Stoutenburgh,NYSDEC 21 S. Putt Corners Road New Paltz, NY, 12561
Evelyn C. Heady Susan Drive Poughquag, NY, 12570
Geoff Laccetti,NYSDOH 2 University Place Room 2005 Albany, NY, 12203
Hamilton Ferris 105 Clove Valley Road Lagrangeville, NY, 12540
J.B. Smith 30 Underhill Road Poughquag, NY, 12570
Jack White Main Street POB 400 Poughquag, NY, 12570
James Pietras Gardner Hollow Road Ext Poughquag, NY, 12570
Jeffrey Dimoore, PW Scott Assoc. Danbury Brewster Road Brewster, NY, 10509
Joe Battista,NYSDEC 21 S. Putt Corners Road New Paltz, NY, 12561
Joel Miller 22 IBM Road Suite 104 A Poughkeepsie, NY, 12601
John Jordan 3 Martin Road Hopewell Junction, NY, 12533
John Rodgers Beekman Road Hopewell Junction, NY, 12533
John Schaffer Main Street Poughquag, NY, 12570
John & Martha Girardi Main Street RR 3 Box 405A Poughquag, NY, 12570
Jon & Olivia Altschuler 297 Beekman Poughquag Road Poughquag, NY, 12570
Jonathan Altschuler, Esq. POB 214 Poughquag, NY, 12570

Joseph Garan,Highway Dept	4 Main Street Poughquag, NY, 12570
Joseph Goldfarb	98 Stowe Drive Poughquag, NY, 12570
Karen Amiot	RR 1 Box 11A Poughquag, NY, 12570
Kevin Irwin	390 Fishkill Avenue Beacon, NY, 12508
Kirk Denton	Main Street Poughquag, NY, 12570
Al Klauss,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
L. & J. Eigo	Maple Road Poughquag, NY, 12570
Laura & Jerry Balcom	Mayfair Road Poughquag, NY, 12570
Lawrence Heaton	101 Ferris Lane Poughkeepsie, NY, 12603
Lee Eaton	POB 315 Clove Valley Road Poughquag, NY, 12570
Lenore Gale	Gardner Hollow Road Poughquag, NY, 12570
Louis Gonnella	RFD 1 Peach Lane North Salem, NY, 10560
Louise Beneway	POBox 693 Poughquag, NY, 12570
Lucette Carter	Box 37 RR 2 Poughquag, NY, 12570
Madeline Katan	Pleasant Ridge Road Poughquag, NY, 12570
Marc Moran,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Mark VanDeusen,NYSDOH	547 River Street Troy, NY, 12180
Mary E.Capollo	POB 336 Poughquag, NY, 12570
Maynard Miller	POB 324 Poughquag, NY, 12570
Michael C. Caldwell, MD.	Dutchess Co DOH 387-391 Main Mall Poughkeepsie, NY, 12601
Mike Knipfing,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Morris Schneck	541 Beekman Road Hopewell Junction, NY, 12533
Mr & Mrs Richard Perri	Main St POB 271 Poughquag, NY, 12570
Mr S. Todd Pew	67 Elizabeth Street Battle Creek, MI, 49017-3711
Mr. & Mrs. Douglas O'Dell	Carey Road POB 610 Poughquag, NY, 12570
News Director,WKZE	67 Main Street Sharon, CT, 06069
News Director,WRNN TV	721 Broadway Kingston, NY, 12401
News Director,WRNX	12 Tucker Drive Poughkeepsie, NY, 12603
News Director,Panda	80 E Market Street Rhinebeck, NY, 12572
News Director,WBNR	475 South Ave Beacon, NY, 12508
News Director,News Center 6	38 Old Route 9 Wappingers Falls, NY, 12590
News Director,WEOK/WPDH	POB416 Poughkeepsie, NY, 12602
News Director,TCI of NY	2 Reservoir Square Poughkeepsie, NY, 12601
News Director,WRWD/WBWZ	80 Washington Ave Suite 300 Poughkeepsie, NY, 12601
News Director,WHVW	316 Main Mall Poughkeepsie, NY, 12601
News Director,WKIP	12 Tucker Drive Poughkeepsie, NY, 12602
Al Klauss,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Occupant	3105 Chelsea Cove Hopewell Junction, NY, 12533
Occupant	RR 1 Box 117K Rose Street Poughquag, NY, 12570
Patrick Golden,LCSWM	4 Empire State Plaza 5th floor Albany, NY, 12248

Patrick Manning	544 Legislative Office Building Albany, NY, 12248
Peter Doshna,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Ram Pergadia,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Ray Delamarter	392 Main Street Box 307 Poughquag, NY, 12570
Raymond & Claire O'Dell	Box 395 RR 2 Poughquag, NY, 12570
Rebecca Paley Poughkeepsie Journal	85 Civic Plaza Poughkeepsie, NY, 12601
Resident	217 Sylan Lake Road Hopewell Junction, NY, 12533
Resident	27 High Ridge Road Hopewell Junction, NY, 12533
Resident	41 Regent Drive Hopewell Junction, NY, 12533
Richard Nolan	Clapp Hill Road Lagrangeville, NY, 12540
Robert & Carola Slater	271 Reilly Road Lagrangeville, NY, 12540
Robert H. Phillips	RR 2 Box 403 Poughquag, NY, 12570
Rosemarie Chiusano	Alary Road Lagrangeville, NY, 12540
Sal Ervolina, NYSDEC BERA	50 Wolf Road Albany, NY, 12233-7010
Rudy Woodin	POB 217 Poughquag, NY, 12570
Sally & Al O'Hara	615 Beekman Road Hopewell Junction, NY, 12533
Sean Johnson	Gardner Hollow Road Poughquag, NY, 12570
Senator Charles Schumer	State Office Building 313 Hart Washington, DC, 20510
Senator Daniel Moynihan	Senate Office Building Washington, DC, 10510
Senator Steven Saland	946 Legislative Office Building Albany, NY, 12247
Senator Vincent Leibel	802 Legislative Office Building Albany, NY, 12247
Supervisor Anthony McKee	4 Main Street Poughquag, NY, 12570
Tanya Reinhard,NYSDEC	21 S. Putt Corners Road New Paltz, NY, 12561
Tanya & Victor Capollo	RR2 Box 387 Poughquag, NY, 12570
The Pellicano Family	612 Beekman Road Hopewell Junction, NY, 12533
The Roberts Family	384 Beach Road Poughquag, NY, 12570
Theda Slocum	RR 3 Box 387 Poughquag, NY, 12570
Thomas Kirwin	633 Legislative Office Building Albany, NY, 12248
Tom Haggerty	182 Stowe Road Poughquag, NY, 12570
Virginia Ward	Town Clerk 4 Main Street Poughquag, NY, 12570
Wayne Strack	RR 1 Box 339 Clinton Corners, NY, 12514
Werner W. Stiegler	566 Beekman Road Hopewell Junction, NY, 12533
William Dean	70 Baker Road Hopewell Junction, NY, 12533
William R. Steinhaus	County Excutive 22 Market Street Poughkeepsie, NY, 12601
Willis Stephens	43 Legislative Office Building Albany, NY, 12248

Government Officials

Anthony McKee	Town Supervisor Beekman Town Hall
Virginia Ward	Town Clerk Beekman Town Hall
Tanya Reinhard (DER)	NYSDEC Region 3 Division of Environmental Remediation 21 South Putt Corners Road New Paltz, New York 12561 845/256-3000
Denise D'Ambrosio	NYSDEC 200 White Plains Road Tarrytown, NY, 10591-5805 914/332-1835 ext. 318

This Contact List includes the individuals who will be recipients of all required CPP mailings, including the final Draft of the Remedial Design workplan, Proposed Remedial Action Plan (PRAP), and the selected remedy upon completion of the Feasibility Study and Record of Decision.

Project Contacts

Tanya Reinhard, Project Manager
NYSDEC
21 South Putt Corners Road
New Paltz, NY 12561
(845)-256-3156

Geoff Laccetti, Public Health Specialist
NYSDOH
547 River Street
Troy, NY 12180
1-800-458-1158 x27880

Mark Van Deusen, Public Outreach Unit
NYSDOH
547 River Street
Troy, NY 12180
1-800-458-1158 x27530

Michael J. Knipfing, Citizen Participation Specialist
NYSDEC
21 South Putt Corners Road
New Paltz, NY 12561
(845)-256-3154

Document Repositories

Information generated during the RI process will be made available for public viewing and copying, in accordance with 6NYCRR Part 375. Two repositories have been selected for such documentation:

Beekman Library
Clove Valley Plaza
P.O. Box 697
Poughquag, NY 12570
(845)-724-3414
Tuesday 10-6, Wednesday 3-8, Thursday 10-8, Friday 10-4, Saturday 10-4

Town Clerk Virginia Ward
Beekman Town Hall
4 Main Street
Poughquag, NY 12570
(845)-724-5300
M-F 9am-4pm

NYSDEC
21 South Putt Corners Road
New Paltz, New York 12561
(845) 256-3154
M-F 8:30 am to 4:45 pm

Site-Specific Citizen Participation Activities

A Supervisor's update will be included at each Town Board Meeting. This update will include, at a minimum, a summary of the monthly status report submitted by Conrad Geoscience for the previous month. Conrad Geoscience will be available for presentations at the request of the Town Supervisor.

In addition to the status reports submitted to the Town by Conrad Geoscience, and any technical presentations the consultant may make to the Town Board during the remediation process, the following additional CP activities will be undertaken:

1) Review and update the site's mailing list as necessary.

2) Place the Draft Remedial Design/Remedial Action Plan in the document repositories.

3) Prepare and mail a Fact Sheet describing the Remedial Design as well as the planned start date for soil excavation.

4) Prepare and mail a Fact Sheet to be sent to the site's mailing list when excavation is completed and the soil removed.

Upon completion of the Remedial Design, summary documents will be available at the specified repositories for public review.

GLOSSARY

This Glossary defines terms associated with New York's hazardous waste site citizen participation program, and important elements of the hazardous waste site remedial program. Words in **bold** in the definitions are defined elsewhere in the glossary. A list of acronyms often used in the remedial program begins on page 18.

Administrative Record	Part of a site's **Record of Decision** which lists and defines documents used in the development of NYSDEC's decision about selection of a remedial decision.
Availability Session	A scheduled gathering of program staff and members of the public in a casual setting, without a formal presentation or agenda but usually focusing on a specific aspect of a site's remedial process.
Citizen Participation	A Program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and the government agencies responsible for investigating and remediating them.
Citizen Participation Plan	A document which must be developed at a site's **Remedial Investigation** stage. A CP Plan describes the citizen participation activities that will be conducted during a site's remedial process.
Citizen Participation Record	A document prepared at a major remedial stage which describes the citizen participation activities required at that stage. A CP record also directs a scoping process to determine if additional citizen participation activities are appropriate and feasible.
Citizen Participation Specialist	A staff member from an NYSDEC central office or regional office who has specialized training and experience to assist a **project manager** and other staff to plan, conduct and evaluate a site-specific citizen participation program.
Classification	A process to place a hazardous waste site within a category which defines its hazardous waste status and its threat or potential threat to public health and the environment. Sites are listed along with their classifications in the **Registry of Inactive Hazardous Waste Disposal Sites.**

Class 1 - Causing or representing an imminent danger of causing irreversible or irreparable damage to public health or environment – immediate action required.

Class 2 - Significant threat to public health or environment – action required

Class 2a - Temporary classification assigned to a site for which there is inadequate or insufficient data for inclusion in any other classification.

Class 3 - Does not present a significant threat to public health or environment – action may be deferred.

Class 4 - Site properly closed – requires continued management

Class 5 - Site properly closed – no further action required

Delisted - Site no longer considered an inactive hazardous waste disposal site.

Comment Period

A time period for the public to review and comment about various documents and DER actions. For example, a 30-day comment period is provided when DER issues a **Proposed Remedial Action Plan (PRAP)**, and when DER proposes to delist a site from the **Registry of Inactive Hazardous Waste Disposal Sites.**

Consent Order

A legal and enforceable agreement negotiated between NYSDEC and a **responsible party.** The order sets forth agreed upon terms by which a responsible party will undertake site investigation and/or cleanup, or pay for the costs of those activities. The order includes a description of the remedial actions to be taken by the responsible party with NYSDEC oversight, and a schedule for implementation.

Contact List

Names, addresses and/or telephone numbers of individuals, groups, organizations, government officials and media affected by or interested in a particular hazardous waste site. The size of a contact list and the categories included are influenced by population density, degree of interest in a site, the stage of the remedial process and other factors. It is an important tool needed to conduct outreach activities.

Delist	Action by which DER removes a hazardous waste site from the **Registry of Inactive Hazardous Waste Disposal Sites** upon determination that: the site contains inconsequential amounts of hazardous waste; or that a remediated site no longer requires **Operation and Maintenance;** or that a remediated site does not require Operation and Maintenance. A proposal to delist a site triggers a public notification and **comment period** process.
Division of Environmental Enforcement (DEE)	A unit within the New York State Department of Environmental Conservation which works with the **Division of Environmental Remediation** and others to negotiate with **responsible parties** to achieve agreements for the investigation and remediation of hazardous waste sites. A negotiated agreement is contained in a **consent order.**
Division of Environmental Remediation	Formerly the **Division of Hazardous Waste Remediation,** a major program unit within the New York State Department of Environmental Conservation created to manage the hazardous waste site remedial program from site discovery through **Operation and Maintenance** activities. Staff include: engineers, geologists, chemists, attorneys, citizen participation specialists, environmental program specialists and support staff.
Division of Hazardous Waste Remediation	(See **Division of Environmental** Remediation.)
Document Repository	A file of documents pertaining to a site's remedial and citizen participation programs which is made available for public review. The file generally is maintained in a public building near the hazardous waste site to provide access at times and a location convenient to the public.
Enforcement	NYSDEC's efforts, through legal action if necessary, to compel a **responsible party** to perform or pay for site remedial activities. NYSDEC may perform this effort by itself or in concert with other agencies.
Environmental Quality Bond Act (EQBA)	The 1986 Environmental Quality Bond Act which gives New York State bonding authority of up to $1.2 billion to fund the State's share of the total cost of remediating hazardous waste sites in New York.

Fact Sheet	A written discussion about part or all of a site's remedial process, prepared and provided by DER to the public. A fact sheet may focus on: a particular element of the site's remedial program; opportunities for public involvement; availability of a report or other information, or announcement of a **public meeting** or **comment period**. A fact sheet may be mailed to all or part of a site's **contact list**, distributed at meetings, placed in a **document repository** and/or sent on an "as requested" basis.
Interim Remedial Measure (IRM)	A discrete action which can be conducted at a site relatively quickly to reduce the risk to people's health and the environment from a well-defined hazardous waste problem. An IRM can involve removing contaminated soil and drums, providing alternative water supplies or securing a site to prevent access.
National Priorities List	The U.S. Environmental Protection Agency's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from a special trust fund.
New York State Department of Health	Agency within the executive branch of New York State government which: performs health-related inspections at suspected hazardous wastesites; conducts health assessments to determine potential risk from environmental exposure; reviews Risk Assessments prepared during the **Remedial Investigation and Feasibility Study**; conducts health-related community outreach around sites; and reviews remedial actions to assure that public health concerns are adequately addressed.
New York State Department of Law	Agency within the executive branch of New York State government which takes the lead on hazardous waste sites requiring civil enforcement through court action. Litigation can involve negotiations and court action with **responsible parties** to clean up sites; natural resource damage claims, and recovery of remedial costs.
New York State Registry of Inactive Hazardous Waste Disposal Sites	The "Registry." A document which NYSDEC is directed by law to maintain and which lists and provides information about every hazardous waste sites in New York State which meets criteria established through a definition of hazardous waste and a **classification** system.

Operable Unit	A discrete part of an entire site that produces a release, threat of release, or pathway of exposure. An Operable Unit can receive specific investigation, and a particular remedy may be proposed. A **Record of Decision** is prepared for each Operable Unit.
Operation and Maintenance	A period in which remedial action may be conducted following construction at a site (for example, operation of a "pump and treat" system), or which is performed after a remedial action to assure its continued effectiveness and protection of people's health and the environment. Activities can include site inspections, well monitoring and other sampling.
Preliminary Site Assessment (PSA)	A PSA is DER's first investigation of a site. A PSA is performed to determine if a site meets New York State's definition of an inactive hazardous waste disposal site by confirming the presence of hazardous waste and determining if the site poses a significant threat to public health or the environment.
Project Manager	An NYSDEC staff member within the **Division of Environmental Remediation** (usually an engineer, geologist or hydrogeologist) responsible for the day-to-day administration of remedial activities at, and ultimate disposition of, a hazardous waste site. The Project Manager works with legal, health, **citizen participation** and other staff to accomplish site-related goals and objectives.
Proposed Remedial Action Plan (PRAP)	An analysis by DER of each alternative considered for the remediation of a hazardous waste site and a rationale for selection of the alternative it recommends. The PRAP is created based on information developed during the site's **Remedial Investigation and Feasibility Study.** The PRAP is reviewed by the public and other state agencies.
Public Meeting	A scheduled gathering of **Division of Environmental Remediation** staff with the affected/interested public to give and receive information, ask questions and discuss concerns about a site's remedial program. Staff from other NYSDEC divisions, legal and health staff, and staff from consultants and a responsible party often also attend. A Public Meeting, unlike an **availability session**, generally features a formal presentation and detailed agenda.

Reclassification	A process by which DER redefines the threat posed by a hazardous waste site to public health and the environment by developing and assessing site information and, based on new findings and conclusions, assigning a new classification code.
Record of Decision (ROD)	A Document which provides definitive record of the cleanup alternative that will be used to remediate a hazardous waste site. The ROD is based on information and analyses developed during the **Remedial Investigation/Feasibility Study** and public comment.
Remedial Alternatives Report (RAR)	A report that contains an evaluation of options for the remediation of any contamination in, on, or under, or emanating from, a property that includes an analysis of data and other information concerning the nature and extent of that property's contamination and is generally performed concurrently, and in an interactive fashion, with site investigation.
Remedial Construction	The physical development, assembly and implementation of the remedial alternative selected to remediate a site. Construction follows the **Remedial Design** stage of a site's remedial program.
Remedial Design	The process following finalization of a **Record of Decision** in which plans and specifications are developed for the **Remedial Construction** of the alternative selected to remediate a site.
Remedial Investigation/ Feasibility Study (RI/FS)	The RI fully defines and characterizes the type and extent of hazardous waste contamination at the site. The FS, which may be conducted during or after the RI, uses information developed during the RI to develop alternative remedial actions to eliminate or reduce the threat of hazardous waste contamination to public health and the environment.
Responsible Party	An individual or business who: currently owns or operates a hazardous waste site; or historically owned or operated a site when hazardous waste was disposed; or generated hazardous waste at a site; or transported hazardous waste to a site.
Responsiveness Summary	A written summary of major oral and written comments received by DER during a **comment period** about key elements of a site's remedial program, such as a **Proposed Remedial Action Plan**, and DER's response to those comments.

Site Investigation (SI)	A process undertaken to determine the nature and extent of contamination in, on, and under, and emanating from a property. The **SI** includes the gathering of sufficient information to determine the necessity for, and the selection of appropriate method of, remediation of contamination in, on or under, or emanation from a property.
Site Issues and Community Profile and Scoping Sheet	A document prepared to support each **Citizen Participation Record**. Each Scoping Sheet identifies issues and information important to DER and the community and information that needs to be exchanged at a particular remedial stage. The Scoping Sheet also summarized information about the surrounding community, including demographics, special needs, etc.
Superfund	The common name for the Federal program established by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended in 1986. The Superfund law authorizes the U.S. Environmental Protection Agency to investigate and clean up sites nominated to the **National Priorities List.**
Title 3 Project	Remediation of a municipally owned site through the State Superfund Title 3 Program whereby New York State pays 75 percent of eligible costs for remediation and the municipality pays 25 percent.
Toll-Free "800" Number	An information line maintained by the **Division of Environmental Remediation** to provide convenient access for people who have questions, concerns or information about hazardous waste sites and their remedial programs.

ACRONYMS

AG	New York State Attorney General's Office
ARAR	Applicable, Relevant and Appropriate Requirement
C & D	Construction and Debris
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CO	Consent Order
CP	Citizen Participation
CPP	Citizen Participation Plan
CPS	Citizen Participation Specialist
CQC/CQA	Construction Quality Control/Construction Quality Assurance
DEE	Division of Environmental Enforcement
DER	Division of Environmental Remediation, formerly the Division of Hazardous Waste Remediation
DHWR	Division of Hazardous Waste Remediation , now the Division of Environmental Remediation
DOD	Department of Defense
DOL	Department of Law
DOW	Division of Water
ENB	Environmental Notice Bulletin
EQBA	1986 Environmental Quality Bond Act
EPA	Environmental Protection Agency
F & W	Division of Fish and Wildlife
FDA	Food and Drug Administration
FSF	Federal Superfund
FOIL	Freedom of Information Law
FS	Feasibility Study
FY	Fiscal Year
GPM	Gallons Per Minute
HeLP	Health Liaison Program
IRM	Interim Remedial Measure
mg/kg	Milligrams per kilogram
NAPL	Non-Aqueous Phase Liquid
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O & M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	Poly-Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl

PM	Project Manager
ppm/ppb/ppt	Parts per million/parts per billion/parts per trillion
PRAP	Proposed Remedial Action Plan
PRP	Potentially Responsible Party
PRS	Priority Ranking System
PSA	Preliminary Site Assessment
QA/QC	Quality Assurance/ Quality Control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFP	Request for Proposals
RHWRE	Regional Hazardous Waste Remediation Engineer
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Responsible Party
SSF	State Superfund
TAGM	Technical and Administrative Guidance Memorandum
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	Treatment, Storage and Disposal Facility
ug/l	Micrograms per liter
USGS	U.S. Geological Service
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound

Quality Assurance / Quality Control Plan

BEEKMAN HIGHWAY GARAGE

NYSDEC Site # 3-14-094

Conrad Geoscience Corp. File #TB000010

October 2000

Prepared for:

New York State Department of Environmental Conservation
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Prepared by:

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QUALITY ASSURANCE/QUALITY CONTROL PLAN

Quality assurance and quality control (QA/QC) practices are defined as the management procedures necessary to produce analytical data of consistent quality. Such procedures include appropriate field methods, analytical methods, use of pure chemicals or compound mixtures, appropriate calibration techniques, as well as all reference and proficiency checks. QA/QC will be accomplished partly through the implementation of Conrad Geoscience standard operating procedures (SOPs) for field practices and sample collection (Appendix F). QA/QC is also a consideration for analytical data. Quality control is considered to be one aspect of quality assurance and is defined as those procedures needed to ensure consistent and useable data that can withstand legal and scientific challenges. Quality control measures will include field blanks and trip blanks.

PROJECT ORGANIZATION

The organizational structure for the project will consist of a Project Manager, Senior Technical Advisor, and Health and Safety Officer.

Project Manager

The Project Manager (PM) will be the primary point of contact and will have primary responsibility for technical, financial and scheduling matters. The PM's responsibilities will include:

- assignment of duties to the project staff and orientation of the staff to the needs and requirements of the project;
- supervision of the performance of project team members;
- monitoring all aspects of the project to verify that all work is being completed in accordance with this QA/QC Plan;
- budget and schedule control;
- establishment of a project record-keeping system;
- review of all major project deliverables for technical accuracy and completeness and
- project closeout.

Senior Technical Advisor

The Senior Technical Advisor's responsibilities will include:

- providing technical assistance to the Project Manager as appropriate; and
- reviewing the quality of the data gathered during the course of the project and the final project report.

Health and Safety Officer

The Health and Safety Officer (HSO) has the following responsibilities:

- interface with the Project Manager as may be required in matters of health and safety;
- approve the site-specific Health and Safety Plan (HASP) for the project;
- amend the approved HASP as site conditions warrant;
- monitor compliance with the approved HASP;
- assist the Project Manager in ensuring that proper health and safety equipment is available for the project; and
- approve personnel to work on the site with regard to medical examinations and health and safety training.

FIELD PROCEDURES

This section describes procedures that will be followed during the field excavation and sampling program. The program includes the following operations:

- underground utility clearance;
- contaminated source removal; and
- groundwater sampling.

The following sections provide descriptions of the procedures which will be used to complete each operation.

Underground Utility Clearance

Prior to start of any field work, the proposed excavation location will be established by directly measuring off of existing physical features such as buildings or other landmarks with a measuring tape. Painted markings will then be drawn to show the area of the excavation. The Underground Facilities Protective Organization (UFPO) will be contacted to arrange for the location and marking of all underground utilities in the vicinity of the proposed excavation area. If necessary, a private utility locating service will be used to locate private underground utilities which will not be located by the UFPO subscribing utilities.

Contaminated Source Removal

After the extent of the excavation is marked out by the Project Manager, excavation of the contaminated soils will begin by saw-cutting the overlying asphalt. Soils will then be removed from the area using a bulldozer or backhoe; operators will be careful to watch for marked underground utilities during excavation. Contaminated soils will be stockpiled on plastic sheeting pending waste characterization and off-site disposal.

Groundwater Sampling Procedures

Procedures for groundwater sampling are contained in the Conrad Geoscience Corp. Standard Operating Procedures (SOP).

SAMPLE CUSTODY

Chain of Custody Procedures

The Project Manager will follow the sample custody or chain-of-custody protocols described in "NEIC Policies and Procedures," EPA-330/978-DDI-R, revised June 1985. This custody is in three parts:

- sample collection;
- laboratory analysis; and
- final evidence files.

Final evidence files, including all originals or laboratory reports and purge files, are maintained under document control in secure area. A sample or evidence file is under you custody if it is:

- in your possession;
- in your view, after being in your possession;
- in your possession and you place them in a secured location; or
- in a designated secure area.

Field Chain-of-Custody Procedures

The sample packaging and shipment procedures summarized below will ensure that the samples arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible fore the care and the custody of the samples until they are transferred or properly dispatched. As few people as possible should handle the samples.
- All bottles will be tagged with sample numbers and locations.
- All sample tags will be completed for each sample using waterproof ink.
- The Project Manager will review all filed activities to determine whether proper custody procedures were followed during the filed work and decide if additional samples are required.

Field Documentation

All data collecting activities performed shall be recorded in a field logbook. As such, activities will be described in as much detail as possible so that persons going to the site could re-construct a particular situation without reliance on memory.

Entries into the logbook will contain a variety of information and should form a contemporaneous record of the daily activities. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection being used, and the signature of the person making the entry will be entered. The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Samples will be collected following the sampling procedures documented in the site specific Work Plan. The equipment used to collect the samples will be noted, along with the time of sampling, sample description, depth at which sample was collected, volume and number of containers.

Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

Transfer of Custody and Shipment Procedures

Samples are to be accompanied by a properly completed chain-of-custody from. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of the samples, the individuals relinquishing and receiving will sign, date and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, or to the laboratory.

Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis, with separate custody record enclosed in each sample cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals are covered with clear tape. The cooler is strapped shut with strapping tape in at least two locations.

All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and the copies will be retained by the sampler and returned to the Project Manager.

If the samples are sent by a common carrier, a bill of lading, or air bill should be used. Receipts will be retained as part of the permanent documentation. Carriers are not required to sign off on the custody form as the custody forms are sealed inside the sample cooler and the custody seals remain intact.

Laboratory Chain-of-Custody Procedures

The Project Manager for the investigation will notify the laboratory sample controller of the upcoming filed sampling activities prior to shipment to the laboratory. The notification will include information regarding the number and type of samples to be shipped and the expected date of arrival. The sample control procedures at the laboratory will meet the following criteria:

- The laboratory sample controller will be responsible for maintaining custody of the samples and for maintaining all associated records for documentation.

- Contents of each sample cooler will be compared to the chain-of-custody documents for correctedness and traceability.

- The sample controller will sign the chain-of-custody record and record the time and date received.
- If any discrepancies are found by the sample controller, the Project Manager will be immediately notified.
- The samples will be stored at a temperature of four degrees Celsius in a secure area until they are analyzed
- A laboratory tracking record or number will accompany the sample through the analysis.
- A copy of the tracking form and number will become a part of the permanent project record file.

Final Evidence File Custody Procedures

The evidence files for analytical data will be maintained at the investigation contractor's office. The contents of the evidence file will include all relevant records, such as reports, correspondence, subsurface logs, field laboratory sample preparation and analysis logbooks, data package, pictures, subcontractors's reports, chain-of-custody records/forms, and data review reports.

CALIBRATION PROCEDURES

This section establishes the procedures for maintaining the accuracy of instruments and measuring equipment to conduct field laboratory measurements and tests.

Responsibilities

The Project Manager is responsible for the calibration of field equipment.

General Calibration Procedures

Field testing used for analytical determinations fall into two categories: those calibrated prior to each use and those calibrated on a scheduled periodic basis. Frequency of calibration will be based on the type of equipment, inherent stability, manufacturer's recommendations, values given in national standards and the intended use.

Equipment will be calibrated using reference standards or accepted values of natural physical constants. If national standards do not exist, the basis for calibration will be documented. Field equipment calibration will be performed as described by the equipment manufacturer.

Calibrated equipment will be uniquely identified by the manufacturer's serial number or other means. A label with the identification number and the date when the next calibration is due will be physically attached to the equipment. If this is not possible, records traceable to the equipment will be readily available for reference.

Calibration Records

Records will be prepared and maintained for each piece of calibrated measuring and testing equipment and for each reference standard to demonstrate that established calibration procedure have been followed. Records for equipment used for this project will be kept in bound notebook dedicated for this purpose with the initials of individuals after each entry.

Calibration records will include, as appropriate:

- type and identification number of equipment;
- calibration frequence and acceptable tolerances;
- identification of calibration procedure used;
- calibration data;
- certifications or statements of calibration provided by manufacturers and external agencies, and traceable to national standards; and

General calibration requirements are presented below:

- all adjustable , mechanical, electronic and/or recording instruments will be calibrated prior to entry into the field;
- instruments that cannot be readily calibrated will be performance-checked against a similar instrument with known performance. If the performance of the instrument varies by more than +/- 5% it will be returned to the manufacturer for proper maintenance and calibration; and
- instruments that require frequent calibration checks or calibration during use will be calibrated as specified in their operating manuals.

Maintenance

Each piece of equipment used in activities affecting data quality will be maintained according to specifications provided by the manufacturer. The Project Manager will be responsible for performing routine maintenance and will have available tools and spare parts to conduct routine maintenance. If the equipment or instrument cannot be maintained to manufacturer's specifications or cannot be properly calibrated, it will be returned to the manufacturer or other repair facility for proper maintenance and repair. Once received back form the manufacturer, the instrument will be checked for compliance to project specifications before being returned to routine field use.

Maintenance records for field equipment will be kept in the same notebook as the calibration data.

DATA REDUCTION, VALIDATION AND REPORTING

Data reduction, validation and reporting criteria used will be according to guidelines presented in NYSDEC ASP. Full ASP-Category B deliverables will be provided.

Data Reduction

Following completion of the required analysis, a complete data summary report will be provided by the laboratory to the investigation's Project Manager. Following a review by the QA/QC manager, summary tables will be generated to form the database for the assessment of environmental conditions at the site.

For most analyses, data reduction involves comparing the response of samples to that of standards used to create a standard reference curve. Samples and sample extracts are diluted so that the responses fall within that of the standard curve. The sample response is then multiplied by the appropriate dilution factors to obtain the final result.

Data Validation

An independent data quality validator (DQV) will to review all data generated from these investigations. The data quality validator for this Work Plan is Alpha Geoscience. Don Anee' will be responsible for reviewing the data. A written report outlining the data validation findings be prepared.

Final Reporting and Archiving of Documents

Upon successful complection of the data validation process, all data generated at the site will be tabulated and stored on computer disk. Data summaries and results will be submitted in final report form. This report will consist of all pertinent sample and project information. It will also identify analytical procedures.

APPENDIX F:
OPERATION AND MAINTENANCE MANUAL

OPERATION AND MAINTENANCE

BEEKMAN HIGHWAY GARAGE

NYSDEC Site # 3-14-094

Conrad Geoscience Corp. File #TB000010

October 2000

Prepared for:

New York State Department of Environmental Conservation
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INTRODUCTION

VOCs in groundwater will be monitored annually by collecting and analyzing samples of groundwater from existing on-site and off-site wells. One round of water quality monitoring will be conducted for Whaley Creek. The long-term groundwater monitoring program is meant to accomplish several objectives: 1) Monitor the natural attenuation of solvents and other VOCs present in groundwater; 2) Determine whether VOC concentrations are increasing, decreasing or stabilizing over time; and 3) Determine whether on-site VOCs are moving off-site in significant quantities. The monitoring program will continue until contaminant concentrations show a steadily decreasing trend sufficient to be protective of public health and the environment.

This RD/RA plan encompasses an expanded sampling program so that natural attenuation in the most contaminated areas can be more effectively monitored. The long-term groundwater monitoring program for the Beekman Highway Garage will include annual sampling of ten on-site monitoring wells and seven off-site residential wells.

Seven residences, five of which are supplied with municipal water, and two of which are not supplied with municipal water will be sampled. Of these, four have impacted wells that are no longer in use (Phillips, Delamarter, Bischoff, Huttel); and three (Perri, Jarry and Goldsand) are residential wells that were never impacted but are within the apparent flow path of the solvent plumes. The following offsite wells will be included in the monitoring program: The seven five off-site monitoring wells selected for inclusion in the groundwater monitoring program are: Tax lot #840725 (Phillips); #793689 (Delamarter); #802635 (Bischoff); #805620 (Perri); #885713 (Huttel); #807590 (Jarry); and #796580 (Goldsand). Sample collection from these wells requires that the resident give permission for sampling, and that the supply well can be made operable for sample collection. Should sampling of the proposed wells be impossible, alternate wells will be selected in consultation with the NYSDEC and NYSDOH.

Supply well #840725 (Phillips) is believed to be 94 ft deep, and in 1994 and 1996 contained traces of PCE and TCA This well is immediately down-gradient of Monitoring Well MW-5, which in 1997 contained VOCs totaling 45 ug/l (ppb). In 1994, no VOCs were detected in MW-5, and the NYSDEC concludes that petroleum constituents have moved to this location from the former refueling area (Record of Decision, p. 12).

Supply well #885713 (Huttel) is southeast of the Highway site, and, until 1999, consistently showed nondetectable VOCs. A well sample in 1999, however, contained VOCs totaling 209 ug/l, most of which are normally associated with fuel spills.

Supply well #793689 (Delamarter) is believed to be 3.5 ft deep, and TCA concentrations in this well have declined from 200 ug/l in 1994 to 4 ug/l in 1996. This well also contained a trace of PCE in 1994.

Supply well #802635 (Bischoff) is believed to be 90 ft deep, and PCE concentrations have declined to 4 ug/l since 1994. In 1996, a trace of TCA was detected in this well.

Supply well #805620 (Perri) is believed to be 200 ft deep, and although this well appears to lie squarely within the path of the overlapping PCE and TCA plumes, VOCs have never been detected in this well.

Supply wells #807590 (Jarry) and #796580 (Goldsand) are of undetermined depth, and VOCs have not been detected in previous rounds of sampling.

In addition, ten on-site monitoring wells installed in or near solvent discharge locations and along the down-gradient perimeter of the Town property will be sampled: On-site monitoring wells selected for inclusion in the groundwater monitoring program include: MW-3, MW-4, MW-5, MW-8, MW-16R, MW-17, MW-18S, MW-18D, MW-19S, and MW-19D (Figure 8).

The enclosed drawing (Figure 8) shows the locations of wells to be included in the monitoring program.

Groundwater Sample Collection Procedures

After opening each monitoring well, the depth to water will be measured to the nearest 0.01 foot using an electronic sounding device. Using the total depth of the well established during well installation, the volume of standing water in the well will be calculated and recorded in the field notebook.

All sampling equipment that comes into contact with contaminated soil will be decontaminated to prevent cross-contamination. The following procedure will be used:

Brush/wipe off gross contamination;
Tapwater rinse;
Alconox (detergent) rinse;
Tapwater rinse;
Methanol rinse;
De-ionized water rinse.

Prior to sample collection, wells will be purged of a minimum of three well volumes, or until the physical characteristics (temperature, pH and conductivity) have stabilized. In general, three to five well volumes is sufficient to accomplish this goal.

A bailer will be used to collect a groundwater sample from each monitoring well. The sample will be dispensed from the bailer directly into the appropriate sample container. Residential wells will be sampled directly from the tap after physical characteristics have stabilized.

Sample containers will be labeled with appropriate information such as site location, sample identification (location, depth, etc.), date and time of collection, analysis requested, and sampler's initials. A chain-of-custody form will be completed for all samples collected. One copy is retained and two are sent with the samples to the laboratory. A custody seal will be placed on the cooler prior to shipment. Samples will be shipped to the laboratory within 24 hours of collection.

Laboratory Analysis of Groundwater Samples

Groundwater samples collected from monitoring wells and residential wells will be shipped to a NYSDOH-certified laboratory for analysis for following analytical parameters:

- Target Compound List (TCL) Volatile Organic Compounds (VOCs) via EPA Method 8260 (including MTBE)
- Total organic carbon

Field quality control samples will include:

- Trip Blanks - One trip blank will accompany each day's sample shipment to the laboratory. The trip blank will be analyzed for VOCs only.
- Field Equipment Blanks - One equipment blank will be prepared an analyzed for VOCs only.

ASP Category "B" deliverables will be prepared and the data will be validated by an independent validator.

SAMPLING AND ANALYSIS PLAN
GROUNDWATER MONITORING

Sample Type	Analytical Method	
	VOCs via USEPA Method 8260	Total Organic Carbon
Groundwater Monitoring Well	10 + 1Trip Blank & 1 Field Blank	10 + 1 Field Blank
Residential Supply Well	7 + 1 Trip Blank & 1 Field Blank	7 + 1 Field Blank

Year-by-Year Cleanup Goals

Concentrations of PCE and total VOCs in groundwater are expected to gradually attenuate through natural processes. Of the 17 wells included in the long-term groundwater monitoring program, three on-site monitoring wells, MW-18S, MW-4 and MW-5, will be subject

to year-by-year cleanup goals that have been determined by the NYSDEC. The annual cleanup goals for each well are listed in the table below. For Monitoring Well MW-18S, both PCE and total VOCs will be subject to decreasing cleanup goals. For Monitoring Well MW-4, PCE only will be subject to yearly goals. And for Monitoring Well MW-5, total VOCs will be subject to yearly cleanup goals.

Should the maximum concentrations at any of these three wells exceed the cleanup goal by 20% for three consecutive years, consideration will be given to implementing further investigation or remedial actions. Concentrations in the other 14 wells will be monitored for upward and downward trends, but will not be subject to specific yearly cleanup goals.

YEARLY GROUNDWATER CLEANUP GOALS

Year	*MW-18S* PCE (ug/l)	*MW-18S* Total VOCs (ug/l)	*MW-4* PCE (ug/l)	*MW-5* Total VOCs (ug/l)
1	326	311	75	142
2	242	287	62	139
3	179	264	51	135
4	133	244	42	132
5	99	225	35	129
6	73	207	29	126
7	54	191	24	122
8	40	176	19	119
9	30	163	16	116
10	22	150	13	113
11	16	138	11	110
12	12	128	9	108
13	9	118	7	105
14	7	108	6	103
15	5	100	5	100

Stream Sampling

Three water samples will be collected from Whaley Creek and analyzed for VOCs via EPA Method 8260. Only one round of surface water sampling is planned. One grab sample will be collected from a section of the stream believed to be downstream of its intersection with the solvent plume. Two samples will be collected from sections of the stream believed to intersect the solvent plumes. (See Figure 8).

Report Preparation

Following completion of all tasks, and following receipt of all laboratory results and soil disposal documentation, a report will be submitted to the NYSDEC summarizing the results of this work. The report will include a summary of tasks completed, conditions encountered, deviations from the Work Plan, analytical results, and recommendations for additional work or modifications to the Plan, as necessary.

Subsequent rounds of groundwater monitoring will include summary data tables, and the tables will include a comparison to regulatory standards and to results from previous rounds.

In addition to the above referenced report, the Town of Beekman will submit monthly progress reports to the NYSDEC until the remedial actions are completed and the final report is submitted.