



EBIZNEWDOC



EBIZNEWDOC

Write or Copy/Paste Document Title In This Space

Report. HW. 734051. 1994-01-31. Remedial-Design-Report-Text-
Figures

DO NOT PHOTOCOPY. PRINT FROM PDF VERSION ONLY.



EBIZNEWDOC



EBIZNEWDOC

REMEDIAL DESIGN REPORT

Duva Inactive Hazardous Waste Site
NYSDEC Site No. 7-34-051
Town of Clay, New York

Prepared as Required by
NYSDEC Order on Consent
Index No. A7-0300-93-04

JANUARY 1994

REFERENCE NO. 5471 (7)
This report printed on recycled paper.



TREATEK-CRA COMPANY

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 GENERAL	1
1.2 BACKGROUND	3
1.2.1 Site Location	3
1.2.2 Site History	3
1.2.3 Previous Investigations	5
1.2.3.1 1989 Soil Sampling Program	5
1.2.3.2 Soil IRM Investigations	5
1.2.3.3 1989 Groundwater Sampling Program	6
1.2.3.4 1990 Indoor Air Monitoring	7
1.2.3.5 Remedial Investigation	8
1.2.4 Interim Remedial Measures Implemented To Date	9
1.2.4.1 Groundwater Interim Remedial Measures	9
1.2.4.2 Soils Interim Remedial Measures	10
1.2.5 Nature and Extent of Contamination	10
1.2.5.1 General	10
1.2.5.2 Soils	11
1.2.5.3 Groundwater	14
1.2.5.4 Sediment and Surface Water	16
1.2.5.5 On-Site Air	16
1.2.6 Soil Vapor Extraction Pilot Study	17
2.0 REMEDIAL ACTION GOALS AND OBJECTIVES	19
3.0 PROJECT MANAGEMENT ACTIVITIES	21
3.1 SITE MANAGEMENT PLAN	21
3.2 CITIZEN PARTICIPATION PLAN	21
3.3 ADMINISTRATIVE PERMITTING PLAN	22
4.0 DESIGN PLANS AND SPECIFICATIONS	23
4.1 GENERAL	23
4.2 UPGRADIENT GROUNDWATER COLLECTION TRENCH	23
4.3 SVE SYSTEM	24
4.3.1 Extraction/Air Vent Trenches	25
4.3.2 Vacuum System and Air Treatment System	25
4.3.3 Process Controls and Instrumentation	25
4.4 AREA #3 EXCAVATION	25
4.5 IMPERMEABLE COVER	26
4.5 EXISTING GROUNDWATER TREATMENT SYSTEM	27

TABLE OF CONTENTS

	<u>Page</u>
5.0 REMEDIAL DESIGN IMPLEMENTATION	28
5.1 SITE PREPARATION	28
5.1.1 Site Clearing and Grubbing	28
5.1.2 Security Fence	28
5.1.3 Equipment Decontamination Pad	28
5.2 EXCAVATION AND TRENCHING	29
5.2.1 Excavation Procedures	29
5.2.2 Trenching.....	31
5.3 GRADING AND CAPPING	31
5.4 EQUIPMENT INSTALLATION	32
5.5 SYSTEM START-UP	32
5.6 PROJECT CLOSE-OUT	32
5.7 CONSTRUCTION SCHEDULE AND SEQUENCING	32
6.0 HEALTH AND SAFETY PLAN AND EMERGENCY PROCEDURES.....	34
7.0 SAMPLING, ANALYSIS AND MONITORING PLAN	35
8.0 CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN	36
9.0 OPERATIONS, MAINTENANCE, AND MONITORING PLAN	37
10.0 REPORTING	38
10.1 PROGRESS REPORT	38
10.2 LONG-TERM OPERATION PROGRESS REPORT	38
10.3 FINAL ENGINEERING REPORT	38
10.4 FINAL OMMP	39

LIST OF FIGURES
(Following Report)

FIGURE 1.1	SITE LOCATION
FIGURE 1.2	SITE LAYOUT
FIGURE 1.3	TOTAL VOC CONCENTRATIONS IN SURFACE SOILS (0-6")
FIGURE 1.4	TOTAL VOC CONCENTRATIONS IN SUB-SURFACE SOILS (18-30")
FIGURE 1.5	TOTAL VOC CONCENTRATIONS (PPM) IN SUB-SURFACE SOILS (>30")
FIGURE 1.6	TOTAL VOC CONCENTRATIONS IN GROUNDWATER
FIGURE 1.7	TOTAL VOC CONCENTRATIONS IN SURFACE WATER AND SEDIMENT SAMPLES
FIGURE 4.1	AREA #3 AND SVE REMEDIATION AREAS
FIGURE 5.1	RD/RA PROJECT SCHEDULE

LIST OF APPENDICES

APPENDIX A	SITE MANAGEMENT PLAN
APPENDIX B	CITIZEN PARTICIPATION PLAN
APPENDIX C	ADMINISTRATING PERMITTING PLAN
APPENDIX D	DETAILED DESIGN PLANS AND SPECIFICATIONS
APPENDIX E	HEALTH AND SAFETY PLAN
APPENDIX F	SAMPLING, ANALYSIS AND MONITORING PLAN
APPENDIX G	CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN
APPENDIX H	OPERATIONS, MAINTENANCE AND MONITORING PLAN

1.0 INTRODUCTION

1.1 GENERAL

The Duva Property (referred to herein as "Site") is located in the Town of Clay, New York and is listed on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site #7-34-057. A Remedial Investigation/Feasibility Study (RI/FS) program was completed for the Site in 1992 and a Record of Decision (ROD), dated March 1993, was prepared and issued by the NYSDEC. The ROD identified the remedial action plan for the Site which includes the following:

- i) continued operation, maintenance and monitoring of the existing groundwater collection and treatment system;
- ii) continued operation, maintenance and monitoring of the indoor air contaminant migration system;
- iii) implementation of dual in-situ soil vapor/groundwater extraction system;
- iv) installation of a permanent impermeable cover over the remediation area;
- v) development and implementation of long-term land use restrictions; and
- vi) monitoring and evaluation of the effectiveness of the installed remedy.

A Remedial Design (RD) Work Plan, dated July 21, 1993, was submitted to NYSDEC to describe the remedial design activities for implementation of the above remedial action plan. The NYSDEC provided comments to the July 21, 1993 RD Work Plan and responses to those comments were provided to NYSDEC by letter dated September 2, 1993. The RD Work Plan was subsequently revised and resubmitted to NYSDEC. The NYSDEC approved the RD Work Plan, dated September 14, 1993 and the Work Plan was appended

to the Order on Consent (Index No. A7-0300-93-04) under which the remedial design and remedial action will be performed.

The Remedial Design Report has been prepared in accordance with the Order on Consent and the approved RD Work Plan, dated September 14, 1993, and includes the following:

- i) Site background;
- ii) remedial action goals and objectives;
- iii) detailed design drawings and specifications in sufficient detail to allow the construction and startup of the dual SVE/groundwater collection system, modifications to the existing groundwater treatment system (if required), construction of the air/soil vapor treatment system, and the construction of impermeable cover;
- iv) a time schedule to implement the Remedial Action (RA);
- v) a Health and Safety Plan;
- vi) an Emergency Response Plan;
- vii) a Sampling, Analysis and Monitoring Plan which includes a description of any monitoring, if appropriate, needed during implementation of RA and any periodic groundwater monitoring of wells, if appropriate;
- viii) an Administrative Permitting Plan which identifies all local, State or Federal permits or authorization and access agreements, if any, required to implement the remedial action;
- ix) a Site Management Plan;
- x) a Construction Quality Assurance Project Plan including a contingency plan to be implemented if any element of the RD fails;

- xi) a Draft Operation, Maintenance and Monitoring Plan; and
- xii) a Citizen Participation Plan.

1.2 BACKGROUND

1.2.1 Site Location

The Site is located in the Town of Clay, New York approximately four miles north of the City of Syracuse, New York. The Site encompasses former agricultural land and is situated south of West Taft Road and immediately north of a residential development, Platinum Drive. The general location and layout of the Site are illustrated on Figures 1.1 and 1.2, respectively.

Property immediately to the south and west of the Site consists of recently constructed, single family residential homes; property immediately east and north of the Site consists of undeveloped land. All residential development in the vicinity of the Site is serviced by municipal water and sewer.

The Site occupies approximately five acres of land and is secured with a chain-link fence. The Site itself is partially wooded with heavier vegetation lying immediately to the east. The surface of the Site is grassed and gently slopes from north to south. The topography of the Site and significant surficial features are illustrated on Plan 1 (Site Topographic Plan) of the RI Report, dated April 1, 1992.

1.2.2 Site History

The complete history of the Site is presented in the RI Report. A summary of the Site history is presented below.

The Site was originally owned by Mr. Peter Duva who operated a truck farm business on the property. In December 1986, Mr. Duva sold the property or portions of the property to Donald W. Miller, Inc. Mr. Duva subsequently passed away and Mr. Duva's interests in the Site were assumed by the Duva Estate.

In mid-1987, residents of the adjacent properties contacted the NYSDEC and reported the presence of drums on the Site. In July 1987, the NYSDEC inspected the Site and found numerous drums staged in three separate areas of the property (refer to Figure 1.2). The NYSDEC reportedly collected several samples of the drummed material and of stained soils near the drums. Some of the drum contents and surrounding soils were found to contain resins and low levels of solvents.

Mr. Duva, Donald W. Miller, Inc., and General Electric Company were subsequently identified by the NYSDEC as potentially responsible parties (PRPs) for the Site.

In late 1988, the drums were removed from the Site and disposed of at an appropriate off-Site disposal facility under the direction of Donald W. Miller, Inc. with NYSDEC approval.

In mid 1989, the basement sumps of several homes adjacent to the Site were found to contain solvents. The basement sumps in four homes located immediately adjacent to the Site were subsequently sealed in an enclosure and vented to the outside. An interim remedial measures (IRM) program was later implemented to address groundwater contamination attributable to the Site. The groundwater IRM work activities began in mid 1990 and included the installation and operation of a groundwater collection trench and sump on the downgradient side of the Site and the installation and operation of an on-Site water treatment plant.

In August 1989, the NYSDEC listed the Site on the "Registry of Inactive Hazardous Waste Disposal Sites in New York State" and classified it

as a Class 2 site. A Class 2 site is defined as a "significant threat to the public health or environment - action required". At that time, the PRPs were requested by the NYSDEC to investigate and remediate potential soil contamination at the Site. An Interim Remedial Measures program for soils and an RI/FS were subsequently implemented at the Site.

The results of the various programs implemented at the Site are summarized in the sub-sections which follow.

1.2.3 Previous Investigations

The following discussion briefly summarizes each sampling program. Available data and associated documentation from each is presented in the RI Report.

1.2.3.1 1989 Soil Sampling Program

In January 1989, after the drum and soil removal project was complete, the remaining soil in the three drum staging areas was sampled by J.D. Plumley Engineering, P.C. of Syracuse, New York. A total of 29 sample aliquots were collected and composited in six samples for analyses. Each composite sample represented a suspected "hot spot" within the former drum staging areas.

1.2.3.2 Soil IRM Investigations

Implementation of the soil IRM Program began in July 1990 under the terms and conditions of an Order on Consent (Index No. A7-0232-90-05) entered into by the NYSDEC and the PRPs. The soil IRM Program consisted of the performance of three major tasks, as identified in the soil IRM Work Plan, which included:

- i) investigation/characterization of soils by performance of a magnetometer survey of the Site and the collection of soil samples;
- ii) removal of significantly contaminated soils, if any, which represent an imminent risk or hazard to public health or the environment; and
- iii) temporary securement/isolation of residually contaminated soils remaining on Site, if appropriate.

The field investigative component of the soil IRM Work Plan consisted of a field survey to establish horizontal control; performance of a magnetometer survey over the Site; the screening of surficial soils for organic vapors; and the collection and analysis of surficial and subsurface soil samples for volatile organic compounds (VOCs). This work was conducted by Conestoga-Rovers & Associates (CRA) on behalf of the PRPs in July 1990.

The data from this investigation has been presented in the report entitled "Soil Interim Remedial Measures, Interim Data Report, Duva Property, Town of Clay, New York", dated September 1990 (CRA).

Based on the soil IRM data, the soils located within or adjacent to the former disposal areas did not appear to represent an imminent threat to human health or the environment. However, in order to address visual contamination observed in the soil which had been stockpiled on Site during the original drum removal program, the removal and off-Site disposal of this soil had been recommended and was performed in early 1991.

1.2.3.3 1989 Groundwater Sampling Program

In mid 1989, a groundwater investigation program which included the installation and sampling of four groundwater monitoring wells and sampling of adjacent residential basement sumps, was implemented.

In May 1989, the New York State Department of Health (NYSDOH) sampled basement sumps in homes adjacent to the Site. Samples were analyzed for VOCs.

In June 1989, four groundwater monitoring wells were installed and groundwater samples were collected from each of the four monitoring wells and analyzed for VOCs.

The analytical data obtained from these sampling events were previously reported in the document entitled "Interim Remedial Measures, Duva Property, Town of Clay, New York, Site Code 7-34-051, Volume III", March 23, 1990 (Malcolm Pirnie). Additional data which have been generated during the on-going operation of the groundwater collection trench and on-Site water treatment plant and which are presented under separate cover include: water level measurements, analytical data for extracted groundwater and analytical data from adjacent monitoring wells.

1.2.3.4 1990 Indoor Air Monitoring

Indoor air monitoring was conducted in four homes immediately adjacent to the southeast perimeter of the Site by NYSDOH in January and March 1990. This monitoring was intended to determine the impact the Site may have had on air quality within the adjacent homes and the effectiveness of the corrective measures which had been implemented to seal and vent the basement sumps of these same residences located immediately downgradient of the Site earlier in 1990.

In March 1992, additional monitoring of the indoor air quality in four homes adjacent to the southeast perimeter of the Site was performed by Malcolm Pirnie, Inc. in consultation with the Weinberg Consulting Group.

The results of indoor air sampling performed to date are summarized in the "Remedial Investigation Report", dated March 31, 1992.

1.2.3.5 Remedial Investigation

The characterization of the nature and extent of contamination at the Site was achieved through the completion of the various field activities as proposed in the approved RI/FS Work Plan. These activities included the following:

- i) topographic survey of the Site;
- ii) magnetometer survey of the area north and west of the Site;
- iii) collection of soil samples for the development of a Site Specific Parameter List (SSPL);
- iv) investigation of surficial and/or shallow subsurface soils in the area north and east of the westernmost drum staging area;
- v) collection of subsurface soil samples;
- vi) excavation of test pits;
- vii) installation and sampling of three monitoring wells within the till unit and five shallow monitoring wells within the shallow sand unit overlying the till;
- viii) collection of surface water and sediment samples in drainage swales and ponded areas upstream and downstream of the drum staging areas; and
- ix) related air monitoring.

All results, data and figures produced relating to these activities are presented in the "Remedial Investigation Report", dated March 31, 1992.

1.2.4 Interim Remedial Measures Implemented To Date

Two separate programs, one for groundwater and one for soils, have been developed and implemented as interim remedial measures for the Site. These programs are discussed below.

1.2.4.1 Groundwater Interim Remedial Measures

In June 1989, an interim remedial measures program was implemented pursuant to the Order on Consent (Index No. A7-0225-90-03) to address off-Site contaminated groundwater migration. This program, conducted by Malcolm Pirnie, Inc., included: installation of groundwater piezometers; and the design and construction of a groundwater collection trench to intercept groundwater beneath the Site and prevent its migration off Site. The primary components of the system include:

- i) a subsurface collection drain and collection manhole at the downgradient perimeter of the Site which collects groundwater from the alluvium material situated above the lower permeability till unit;
- ii) a buried forcemain to convey collected groundwater from the collection trench to the on-Site water treatment plant;
- iii) an on-Site water treatment plant which utilizes carbon adsorption for treatment of organics and chemical precipitation for removal of metals (the latter is necessary for removal of iron to meet surface water discharge criteria); and
- iv) a buried discharge pipe leading to a tributary of Bloody Brook.

Groundwater collected in the sumps of the downgradient residences which showed the presence of Site contaminants is also pumped into

the on-Site collection trench for subsequent treatment at the on-Site water treatment facility.

Details of the design of the groundwater collection and treatment systems were submitted to the NYSDEC in the report entitled "Interim Remedial Measures, Duva Property, Town of Clay, New York", March 23, 1990 (Malcolm Pirnie, Inc.). The system was installed and put into operation during the summer of 1990.

1.2.4.2 Soils Interim Remedial Measures

In July 1990, the field investigation phase of the soil IRM Program was performed in accordance with the approved soil IRM Work Plan. Based on the soil IRM investigative results, it was recommended that soil generated during the original drum removal program and which had been stockpiled on Site be removed and disposed off Site in order to address visual contamination observed in the stockpile. By letter dated November 1, 1990, NYSDEC agreed with the recommendation and further requested that additional soil stockpiled on Site as a result of the groundwater interim remedial measures be removed. The work, as proposed and recommended, was performed during the winter/spring of 1991. A description of activities performed is presented in the "Soil Interim Remedial Measures, Soil Stockpile Removal/Disposal, Final Engineering Report, Duva Property, Town of Clay, New York", dated October 1991.

1.2.5 Nature and Extent of Contamination

1.2.5.1 General

Media investigated at the Site prior to and during the RI consisted of the following:

- i) Soils
 - background soils,
 - surface and sub-surface soils over the entire Site;
- ii) Surface Water and Sediments
 - on-Site surface water and sediment,
 - off-Site, downgradient surface water and sediment;
- iii) Groundwater
 - overburden (alluvium and underlying till);
- iv) Air
 - on-Site air quality during active remediation,
 - inside air quality in adjacent residences.

The primary Site contaminants are VOCs consisting of trichloroethene, 1,1,1-trichloroethane, 1,2-dichloroethene, tetrachloroethene, toluene, acetone, ethylbenzene and xylene. The most predominant Site contaminant is trichloroethene. The distribution of contaminants within these media is illustrated on Figures 1.3 to 1.7, inclusive, and is further described in the sections which follow.

1.2.5.2 Soils

Background Soils

None of the Target Compound List (TCL) VOCs were detected in the background samples except for trichloroethene. Trichloroethene was detected at estimated concentrations below the practical quantitation limits.

Base/Neutral Acid extractables (BNAs), including fluoranthene, pyrene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, benzo(a)fluoranthene (b and k isomers), were also detected at estimated

concentrations below the practical quantitation limits; no other BNAs were detected.

DDD, DDE, and DDT (which are generally ubiquitous in agricultural areas) were detected in background surficial soil samples at concentrations ranging from 13J $\mu\text{g}/\text{kg}$ to 630 $\mu\text{g}/\text{kg}$. All of the Target Analyte List (TAL) metals were detected within published concentration ranges for natural soils. No cyanide was detected in the background soil samples.

Surficial and Shallow Subsurface Soils

Residual VOC contamination in surficial soils was greatest within or immediately adjacent to the former drum staging areas. Organic vapor concentrations recorded on Site in the upper foot of the soil horizon indicated the greatest levels of residual organic concentrations in surficial soils located along the western limit of the easternmost drum staging area. The apparent zone of contamination, based on organic vapor concentrations, extends from the northern limit of the eastern most drum storage area, runs southward along a narrow strip located between the two easternmost drum staging areas, and terminates approximately 100 feet south of these areas.

This general distribution of contaminants in the surficial soils was confirmed by the analytical results for the surficial soil samples collected on Site. Concentrations of total VOCs in surficial soils within or immediately adjacent to the former drum staging areas ranged up to 225 ppm. Total VOCs in adjacent surficial soils decreased rapidly with distance from the staging areas and are generally less than 1 ppm. No significant VOC contamination was detected in the surficial soils from the westernmost drum staging area.

The relative distribution of contaminants in the shallow subsurface soils (18 to 30 inches) is generally consistent with the surface soils. The concentrations of VOCs were, however, generally higher in this zone and

ranged up to approximately 7,300 ppm with the highest VOC concentrations reported within or immediately adjacent to the former drum staging areas.

Subsurface Soils

The primary VOCs detected in the on-Site subsurface soils consisted of: 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, 1,2-dichloroethene, toluene, ethylbenzene, and xylenes.

The distribution of contaminants in the subsurface soils was generally consistent with the distribution noted in the surficial soils. VOCs were present at elevated concentrations beneath and downgradient of the drum staging areas. VOCs reported in the sub-surface soils were generally present at higher concentrations than the overlying surficial soils.

Total VOC levels in the westernmost former drum staging areas were generally less than 1 ppm in the shallow subsurface soils and in the deeper subsurface soils.

Subsurface soil contamination in the two easternmost drum staging areas did not extend significantly beyond the eastern and western limits of the drum staging areas. VOC contamination within and/or between the two easternmost former drum staging areas was present up to depths ranging from about 4 feet to 30 feet. VOC contamination downgradient of the eastern drum staging areas was generally present to a maximum depth of approximately 10 feet below ground surface (BGS).

The highest total VOC concentrations reported in any on-Site sample was 41,329 ppm from a depth of 8 to 9 feet below grade at Station B/1+00. The sample was collected from a sand pocket encountered within the till. The sand pocket and associated VOC concentrations were not detected in any adjacent boreholes indicating that the sand pocket is a very localized feature.

The greatest concentrations of VOCs in the remaining sub-surface soils appeared at or above the till contact beneath and downgradient of the easternmost drum staging areas. Soils above the till contact tended to be consistently wet to moist and displayed the highest concentrations of VOCs throughout the Site suggesting this zone represents the primary contaminant migration pathway at this Site. The lower permeability till underlying the Site appears to retard the vertical migration of groundwater and contaminants. This is confirmed by the rapid decrease in VOC concentrations with depth in the till where samples were collected.

1.2.5.3 Groundwater

As was anticipated due to the dense, low permeability nature of the till beneath the Site, groundwater analyses confirmed the most significant groundwater contamination is present on Site in the lacustrine sands overlying the till. The highest estimated total VOC concentrations of 281.136 ppm and 342.816 ppm were reported in monitoring well MW-6, a shallow well completed above the till contact. Total VOC concentrations were several orders of magnitude lower in monitoring well MW-7 (1.569J ppm and 0.887J ppm), the deeper well of the pair completed in the till. VOC concentrations were also lower in monitoring well MW-1 (0.290J ppm and 1.526J ppm) located downgradient of MW-6 on the downgradient side of the groundwater collection trench.

The significantly lower concentrations of VOCs in the till further suggest this layer is retarding the vertical migration of contaminants at the Site.

The significant reduction in contaminant concentrations in MW-1, MW-10, MW-2, MW-9 and MW8, immediately downgradient of the groundwater collection trench, confirm the trench is effectively containing contaminants to the Site. Fluctuations in VOC concentrations in well MW-1 (as well as others on Site) appears to be related to groundwater conditions with

higher concentrations reported during relatively dry periods. As a result, no reduction in VOC concentrations have been observed in this well.

No significant concentrations of VOCs were reported in the remaining monitoring wells installed on or adjacent to the Site. Consequently, the lateral extent (east-west) of on-Site groundwater contamination has been defined and is limited in an east-west or cross-gradient direction. This pattern of contamination is consistent with what would be expected from a discreet source of contamination such as the drum staging areas.

Monitoring well MW-13, installed adjacent to Platinum Drive, downgradient of the Site, had reported total VOC concentrations of 1.26J ppm, 0.067 ppm, 0.013 ppm and 0.007J ppm during the four events it was sampled. These results, presented in their sequence of collection, indicate a significant decrease in concentrations of total VOCs has occurred over time.

VOCs were reported during one event only at 0.004J ppm in monitoring well MW-12, located west of MW-13. The samples collected from temporary probes advanced downgradient of MW-13 were also reported to contain residual low level VOCs.

No significant VOC concentrations were reported in samples collected from MW-14, MW-15, and MW-16 which are downgradient of MW-13. Samples collected from MW-17, immediately downgradient and to the east of MW-13, showed decreasing levels of VOCs in consecutive sampling rounds.

The analytical results from samples collected from downgradient monitoring wells have clearly identified the terminus of the contaminated plume and have delineated the extent of the off-Site migration of contaminants. Additionally, the analytical data indicated a reduction in the spread of contaminants off Site. This reduction in the concentration of VOCs over time indicate that the projects undertaken to date have been successful in reducing the off-Site spread of contamination from on-Site source areas.

A complete description of off-Site groundwater sampling activities and a presentation of associated results are presented under separate cover in the report entitled, "Off-Site Investigation, Addendum, Duva Property, Town of Clay, New York".

1.2.5.4 Sediment and Surface Water

Surface water and sediment samples were collected at two on-Site and three downgradient off-Site locations.

VOCs were not detected in any of the off-Site surface water samples collected. VOCs were detected in the off-Site sediment samples at total VOC concentrations ranging from 0.164 ppm to 0.260 ppm.

VOCs were detected in both on-Site surface water and sediment samples. The highest total VOC concentrations reported were 1.167(J) ppm for surface water and 0.168(J) ppm for sediment at a location immediately downgradient of the easternmost drum staging area. Significantly lower concentrations of VOCs were reported in the surface water and sediment samples collected downgradient of the westernmost drum staging area.

The results indicate residual soil contamination at the Site has had a limited effect on on-Site surface water and sediment quality and a negligible effect on sediment located off-Site. No effect on off-Site surface water was observed.

1.2.5.5 On-Site Air

Total VOCs were measured in the worker breathing zone and around the perimeter of active work areas during all ground intrusive activities conducted at the Site. Although VOCs were detected in the immediate vicinity of some soils disturbed during the investigation, total VOC

concentrations rapidly dissipated and no effects on air quality were noted downwind of the active work zones.

Undisturbed soils at the Site are not expected to have any significant effect on ambient air quality based on existing Site conditions including:

- i) the vegetative cover established over the on-Site soils;
- ii) reported concentrations and limited areal extent of contaminants in the surficial soils; and
- iii) lack of any surface discharge of sub-surface contaminants.

This scenario is supported by the fact that even disturbed contaminated soils, which would have the greatest potential effect on ambient air quality, had a minimal effect on air quality at the Site.

1.2.6 Soil Vapor Extraction Pilot Study

In mid 1992, a soil vapor extraction (SVE) pilot study was performed at the Site by Vapex Environmental Technologies, Inc. (Vapex). The objectives of the pilot study were to evaluate the feasibility of soil vapor extraction (SVE) and, if appropriate, develop a conceptual design parameter for utilizing SVE to remove the VOCs from contaminated subsurface soil at the Site. The results of this study were presented in the report entitled, "Report on the Results of the Soil Vapor Extraction Feasibility Study at the Miller/Duva Site in Clay, New York", dated October 1992. Conclusions presented in the report include:

- i) Subsurface soils at the Site can be categorized into three primary strata: an approximate 2.5 to 3.0 foot thick upper zone of sand/fill alluvium underlain by a 2.5 to 3.0 foot thick zone of wet soft/till transitioning to a

dense till. Groundwater is generally encountered at depths ranging from 2 to 4 feet below grade.

- ii) The majority of elevated VOC concentrations are found within the alluvium and soft till in the vicinity of the two eastern former drum staging areas. VOCs are present in the dense till but appear to be most prominent in the upper two feet of the till.
- iii) The removal of VOCs from Site soils utilizing vacuum extraction will require the implementation of dual phase vacuum extraction for the dewatering of the alluvium and soft till and the reduction in the moisture content of the dense till.
- iv) The installation of an impermeable cover across the entire remediation area will be required to control infiltration and limit short circuiting of air flow.
- v) The dual phase vacuum extraction system should utilize horizontal trench wells as the primary type of extraction well. The trench wells should be installed into the top two to three feet of the dense till. Trenches should be oriented perpendicular to the direction of groundwater flow at a spacing of 40 to 45 feet on center and should be designed to operate as both extraction wells and air inlet wells. Trench wells should be operated at a vacuum of approximately 15 inches of Hg to achieve an air flow rate of 1.5 scfm per foot of trench and a pore volume exchange rate of approximately 2,500 to 3,000 pore volumes per year.
- vi) It is estimated that the majority of VOCs detected in Site soils (within the alluvium and soft till soil stratas) will be removed over the initial 2.5 to 3.5 years of dual phase vacuum extraction operation. However, testing indicates that an overall operating duration of eight to ten years will likely reduce VOC soil concentrations by 90 percent in the upper dense till.

2.0 REMEDIAL ACTION GOALS AND OBJECTIVES

The primary goal of the remedial action is to protect human health and the environment. The Remedial Action Objectives (RAOs) for the Site are:

- i) to prevent or mitigate the migration of Site-related contaminated soils and groundwater, both on-Site and downwind or downgradient from the Site;
- ii) to remediate Site-related contaminated soils and groundwater to the point where leachate from the soils and on-Site groundwater is eliminated or does not present an unacceptable health risk;
- iii) to monitor groundwater and sample soils in a manner to verify the effectiveness of any remedial measures performed; and
- iv) to minimize future Site restrictions to the maximum extent practical in order to allow for potential unimpeded future use of the Site.

Specific media cleanup levels for the Site are identified in the ROD. In the event that the cleanup levels cannot be reached by the continued operations of the dual SVE/groundwater extraction system and the remaining contamination does not pose risk to human health and the environment, it may be requested that the SVE system be discontinued.

In order to achieve the remedial objectives, the remedial action plan (see Section 1.1) identified in the ROD will be implemented and will consist of the following activities:

- i) continued operation, maintenance and monitoring of the existing groundwater collection and treatment system;
- ii) continued operation, maintenance and monitoring of the indoor air containment migration system;

- iii) excavation and backfilling of Area #3 (soil from Area #3 will be transferred to Areas #1 and #2);
- iv) construction and startup of the dual SVE/groundwater extraction system and the soil vapor treatment system, and modification of the existing groundwater treatment system, if required;
- v) construction of an impermeable cap over the remediation area;
- vi) construction of an upgradient groundwater collection trench;
- vii) preparation of the final Operation, Maintenance and Monitoring Plan;
- viii) long-term operation, maintenance and reporting; and
- ix) development and implementation of long-term land-use restrictions.

A detailed description of the above activities are presented in the sections which follow.

3.0 PROJECT MANAGEMENT ACTIVITIES

3.1 SITE MANAGEMENT PLAN

Appendix A presents a Site Management Plan (SMP) developed to describe in detail the overall management of the RA activities. The selected RD/RA contractor is TreaTek-CRA Company. The SMP will include:

- i) a list of key project personnel;
- ii) organization structure of the contractor and subcontractor;
- iii) a brief description of key project personnel's responsibilities; and
- iv) a description of the contractor's previous experience in similar projects.

3.2 CITIZEN PARTICIPATION PLAN

A Citizen Participation Plan (CPP) was prepared and is presented in Appendix B for the Site RD/RA activities. The CPP will be consistent with the NYSDEC publication "New York State Inactive Hazardous Waste Site Citizen Participation Plan", dated August 30, 1988; the NYCRR Part 375 Inactive Hazardous Waste Site Regulations, effective May 30, 1992; and the NYSDEC memorandum, dated October 28, 1992, entitled, "Citizen Participation Requirements Contained in Part 375 - Interim Guidance".

Fact sheets will be developed and/or public information meetings may be held:

- i) upon completion of the RD;
- ii) prior to start of remedial construction;
- iii) after completion of remedial construction; and/or
- iv) annually during the long-term operation, maintenance and monitoring of the remedial system.

3.3 ADMINISTRATIVE PERMITTING PLAN

An Administrative Permitting Plan (APP) is presented in Appendix C and describes in detail the substantive administrative permitting requirements and actual permits, if any, and/or property access agreements necessary to construct and operate the remedial systems. The APP will also include a schedule for seeking and obtaining such permits and/or access agreements.

Actual permits (i.e. air emission discharge permit, SPDES permit) may not be required if operation of the remedial systems can be regulated under the terms and conditions of the RD/RA Consent Order. Treated groundwater from the existing Groundwater Treatment System is currently discharged to an off-Site storm sewer system under the terms and conditions of the Groundwater IRM Consent Order (Index No. A7-0225-90-3) which substantively complies with the NYSDEC SPDES requirements.

4.0 DESIGN PLANS AND SPECIFICATIONS

4.1 GENERAL

There are several components or systems that have been designed or specified to complete the remedial action for the Site. These included the following:

- i) upgradient groundwater collection trench;
- ii) dual groundwater/soil vapor extraction (SVE) systems;
- iii) Area #3 excavation;
- iv) impermeable cover; and
- v) modification of existing groundwater treatment system.

The detailed design specifications and plans for the above components are presented in Appendix D. A brief description of the above components or systems are presented in the following subsections.

4.2 UPGRADIENT GROUNDWATER COLLECTION TRENCH

A Soil Modification Report (SMR) was prepared and submitted to the NYSDEC on September 14, 1993. This report evaluated the effectiveness of several support technologies to reduce the overall estimated soil remedial time and recommended that an upgradient groundwater collection trench be installed to enhance the dewatering of the soils in the remediation area. The upgradient groundwater collection trench will divert clean groundwater from flowing into the SVE Remediation Area and decrease the time required to dewater the SVE Remediation Area.

The Upgradient Groundwater Collection Trench (UGCT) will be installed in accordance with specifications described in Appendix D, upgradient of the remediation area at the northern end of the Site. Figure 4.1 illustrates the approximate boundaries of the SVE Remediation Area. The base of the UGCT will be installed into the top of the till beneath the Site. The collection

media in the trench consists of a 6-inch diameter high density polyethylene (HDPE) perforated pipe surrounded by pea gravel and wrapped within a layer of geotextile fabric. The trench will be sloped toward the east end where a collection sump will be installed. The length of the trench will extend beyond the width of the SVE Remediation Area by approximately 50 feet.

Groundwater will be pumped from the sump through a buried 2-inch diameter polyethylene pipe into the treated water discharge line from the groundwater treatment plant for discharge to the storm sewer without treatment.

4.3 SVE SYSTEM

The SVE Remediation Area will encompass the two eastern former drum staging areas (see Figure 4.1). Contaminated soil from the western former drum staging area (Area #3) will be excavated and transferred to the SVE Remediation Area.

The design of a dual phase SVE system for the Site is based on the conclusions and design criteria specified in the Vapex pilot study report (see Section 1.2.6). The design elements for the SVE system consist of the following:

- i) extraction/air vent trenches;
- ii) vacuum system;
- iii) air treatment system; and
- iv) process control system.

Appendix D presents the detailed specifications for the SVE system, including the layout of the SVE trenches. The construction drawings referenced in Appendix D are provided separately.

4.3.1 Extraction/Air Vent Trenches

Groundwater/soil vapor extraction trenches will consist of perforated high density polyethylene (HDPE) piping (4-inch diameter) installed in a pea gravel bed. The trenches are oriented perpendicular to the groundwater flow toward the existing groundwater collection trench. A low sump in the center will collect groundwater which will then be conveyed to the groundwater treatment system.

The extraction trenches will also be used to supply fresh air into the soil. The extraction trenches will be connected to headers with appropriate valving which will provide for alternating trench service. During routine system operation, the even number of trenches will be used for vapor extraction and the odd numbers will be used as air vents. When being used as air vents, the extraction trenches will be vented to the discharge of the vapor phase carbon adsorbers. This will allow warm air from the carbon adsorbers to be naturally vented into the soil via the extraction trenches/air vents.

4.3.2 Vacuum System and Air Treatment System

The extracted air stream will be treated by vapor phase carbon adsorbers for removal of VOCs prior to discharge to atmosphere.

4.3.3 Process Controls and Instrumentation

The process controls for the SVE system will be integrated with those of the groundwater treatment system.

4.4 AREA #3 EXCAVATION

Potentially contaminated vadose zone soil from former drum staging Area #3 will be excavated from the approximate boundaries

identified on Figure 4.1. The limits of excavation will be based on field organic vapor readings of the excavation base and sides. Excavation of Area #3 will proceed after completion of the SVE trench installation.

As described in Section 5.0, excavated soil from Area #3 will be placed over the SVE Remediation Area and graded as appropriate.

Upon completion of excavation activities, confirmatory soil samples will be collected for analyses of the Site-specific volatile organic compounds (VOCs). One soil sample will be collected for analyses from each of the excavation sides and the base in accordance with procedures specified in the SAMP (Appendix F).

4.5 IMPERMEABLE COVER

An impermeable cover will be installed over the remediation area after construction of the SVE extraction trench system and completion of the excavation/transferring of potentially contaminated soil from Area #3 to the remediation area. The cover will extend approximately 25 feet beyond the limits of the SVE Remediation Area. Plans and specifications for the cover are presented in Appendix D.

The design for the impermeable cover consists of:

- i) a 12 mil thick LDPE liner;
- ii) 6-inch thick layer of sand;
- iii) 6-inch thick layer of topsoil; and
- iv) vegetative cover.

A 6-inch thick layer of clean sand will be placed on top of the liner to protect the liner and facilitate lateral drainage. Six inches of topsoil will be placed over the sand and will be seeded and mulched to promote vegetation and protect the cover from erosion.

4.5 EXISTING GROUNDWATER TREATMENT SYSTEM

The existing groundwater treatment system building will be modified to accommodate the addition of the SVE system. It is anticipated that approximately 15 gallons per minute (gpm) of groundwater will be initially pumped for treatment from the SVE upon startup of the system. After the initial dewatering of the SVE Remediation Area, it is anticipated that a total of 5 gpm of groundwater would be pumped for treatment from the Site. This is within the design criteria of the existing groundwater treatment system. The additional organic loading may result in more frequent carbon canister changes. Accordingly, significant modifications to the system are not required. One modification to be performed is relocation of the bag filters to provide space for the vapor/liquid knock-out pot.

5.0 REMEDIAL DESIGN IMPLEMENTATION

5.1 SITE PREPARATION

Site preparations will include all activities necessary to prepare the Site prior to commencing the excavation activities and are described in the subsections which follow. All activities will be conducted in such a manner to protect the integrity of all on-Site monitoring wells.

5.1.1 Site Clearing and Grubbing

The SVE Remediation Area and the Area #3 excavation area will be cleared and grubbed of all trees, shrubs, logs, brush, rubbish and any other vegetation to the degree necessary to facilitate excavation and construction activities. Cleared trees and other vegetation will be chipped and the chip debris will be spread evenly over the adjacent areas or stockpiled for other use.

5.1.2 Security Fence

The existing fence will be removed at the north end of the SVE Remediation Area prior to trench construction activities. Where practicable, a permanent fence will be installed around the SVE Remediation Area and the UGCT areas prior to or during trench construction activities. Appropriate signs will be posted on the security fence around the Site.

5.1.3 Equipment Decontamination Pad

The existing decontamination pad will be used during the excavation and construction activities. The pad will be repaired, if necessary, prior to commencement of the work activities. All decontamination water will be collected and temporarily stored in a tank. The water from this tank will be

pumped into the water treatment system at an appropriate flow rate to ensure that the treatment capacity of the system is not exceeded.

5.2 EXCAVATION AND TRENCHING

5.2.1 Excavation Procedures

General procedures for excavation, loading and transportation of waste soils from Area #3 to the SVE Remediation Area are summarized below. Procedures may be modified in the field based on field conditions encountered. Soil removal activities shall proceed as follows:

- i) all activities associated with the loading and handling of potentially contaminated soils shall be performed as a minimum in accordance with the Health and Safety Plan (HASP) contained in Appendix E of this Report;
- ii) the initial limits of excavations shall be clearly delineated by snow fencing, barricades, or other appropriate means;
- iii) all equipment required for the implementation of engineering controls shall be assembled on Site prior to initiation of excavation activities, including equipment required for:
 - a) dust suppression,
 - b) regrading, if required, to prevent or contain surface water run-on and runoff, and
 - c) decontamination of equipment and vehicles;
- iv) trees, shrubs and vegetation shall be cleaned from the area as described in Section 5.1.1;

- v) contaminated vadose zone soils shall be excavated by a backhoe or loader; the depth and exact extent of excavation will be confirmed in the field by visual observation and/or by screening exposed soils with an organic vapor analyzer; additional soil will be removed if visible residual soil contamination is detected (i.e. significant staining and organic vapors in excess of 5 ppm above background);
- vi) a backhoe, front-end loader or similar equipment will be used to load vadose zone soils excavated from Area #3 directly into lugger/roll-off boxes or dump trucks and transferred to the SVE Remediation Area;
- vii) if required, haul roads and excavation areas will be wetted down with potable water to prevent excessive dusting during work activities;
- viii) dump trucks or lugger/roll-off boxes used for the transportation and/or staging of waste soils shall comply with applicable regulations; boxes and dump trucks shall be lined prior to loading and shall be equipped with watertight gates;
- ix) exterior sides of the truck or lugger/roll-off boxes shall be draped with polyethylene during loading to prevent contact with potentially contaminated soils;
- x) any visible soils shall be removed from the sides of the vehicle and any other exterior surfaces which may have come in contact with potentially contaminated soils shall be thoroughly removed by brushing prior to leaving the Exclusion Zone (EZ) and/or Contaminant Reduction Zone (CRZ);
- xi) all dump truck or lugger/roll-off boxes shall be securely covered before leaving the EZ or CRZ;
- xii) confirmatory soil samples shall be collected from the base and sides of the Area #3 excavation prior to backfilling (see the SAMP in Appendix F);

- xiii) all equipment which came into contact with potentially contaminated soils shall be thoroughly decontaminated prior to leaving the Site; and
- xiv) upon receipt of approval of the NYSDEC, the excavated areas shall be backfilled with clean imported fill material.

5.2.2 Trenching

The UGCT and the SVE trenches shall be approximately 2 feet wide to an approximate depth of 10-12 feet which is approximately 3 feet into the till beneath the Site. Trenches shall be excavated for construction of the UGCT and the SVE trenches as described in Section 5.2.1 except that excavated soils shall be placed on the ground surface adjacent to the excavated trenches.

Geotextile fabric will be placed in the trench. The 6-inch or 4-inch diameter HDPE perforated pipe will be surrounded by a minimum of 6 inches of crushed gravel or pea gravel. The fabric will be folded over the top of the gravel and the remainder of the trench will be backfilled with the excavated soils.

Detailed specifications and plans for the installation of the trenches are presented in Appendix D.

5.3 GRADING AND CAPPING

Upon completion of the construction of the SVE trenches, excavated soils from Area #3 and the trenches will be graded as specified in Appendix D.

The impermeable cover shall be constructed as specified in Appendix D.

5.4 EQUIPMENT INSTALLATION

Vapor/liquid extraction and treatment equipment consisting of blowers, heat exchangers and vapor phase carbon adsorbers will be installed in accordance with the plans and specifications described in Appendix D.

5.5 SYSTEM START-UP

Upon completion of the equipment installation, the dual vapor/liquid extraction and treatment system will be started up. The system will be performance tested and validated as specified in Appendix D.

5.6 PROJECT CLOSE-OUT

Prior to removal from the Site, all equipment which may have been in contact with potentially contaminated materials will be decontaminated on Site by brushing, wiping or other appropriate means for removal of solids and rinsing with potable water or steam cleaning.

Final Engineering Report shall be prepared with a certification by a Professional Engineer that the Remedial Design was implemented in accordance with the approved Remedial Design.

5.7 CONSTRUCTION SCHEDULE AND SEQUENCING

Figure 5.1 illustrates the proposed schedule for implementation of the remedial action activities.

It is proposed that the Site preparation activities and construction of the UGCT be performed before the end of 1993. This will allow some time for the SVE Remediation Area to dewater during the winter and

spring. Excavation, installation of the SVE trenches and the impermeable cover will be performed in late Spring 1993, weather permitting.

Construction of the air treatment and vacuum systems will follow closely behind the Site capping.

6.0 HEALTH AND SAFETY PLAN AND EMERGENCY PROCEDURES

A HASP is included as Appendix E to this RD report and was developed to detail activities to be performed at the Site for the protection of persons at and in the vicinity of the Site during construction and after construction of the RD.

The HASP includes personnel responsibilities, protective equipment requirements, decontamination procedures, training requirements, medical surveillance requirements and an emergency response plan. The emergency response plan consists of a list of appropriate regulatory and emergency agencies to be notified in the event of an emergency, telephone numbers, and routes to emergency medical care facilities. The emergency plan will be implemented in case of an emergency or special condition, including but not limited to equipment breakdowns, fire, odor, explosion and spills or releases of hazardous or toxic substances.

7.0 SAMPLING, ANALYSIS AND MONITORING PLAN

A Sampling Analysis and Monitoring Plan (SAMP) has been developed to describe in detail the various sampling activities to be undertaken at the Site during the RD/RA and includes an analytical Quality Assurance Project Plan. Appendix F presents the SAMP.

The SAMP includes a discussion of the types of samples, sampling locations, the sampling protocols, analytical parameters and protocols, the data quality objectives, data validation requirements and sampling schedule.

8.0 CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

A Construction Quality Assurance Project Plan (CQAPP) has been prepared to ensure, with a reasonable degree of certainty, that the remedial design meets or exceeds all design criteria, plans, and specifications. The CQAPP is presented in Appendix G. At a minimum, the CQAPP will include the elements that are summarized below:

- i) quality assurance objectives;
- ii) responsibility and authority;
- iii) construction quality assurance personnel qualifications;
- iv) CQAPP staffing requirements;
- v) inspection activities;
- vi) types and frequency of inspection and testing activities;
- vii) sampling requirements;
- viii) documentation of CQAPP activities;
- ix) inspection/testing passing and failure criteria; and
- x) contingency plan for instituting corrective action if any element of the RD/RA fails to achieve any of its design objectives.

9.0 OPERATIONS, MAINTENANCE, AND MONITORING PLAN

A draft Operations, Maintenance and Monitoring Plan (OMMP) is presented in Appendix H. The draft OMMP will describe operations, maintenance, and monitoring activities to be undertaken after approval of the construction of the RD. After completion of the RD activities and RA construction activities, the draft OMMP will be revised, as appropriate, and a final OMMP will be submitted to the NYSDEC.

10.0 REPORTING

10.1 PROGRESS REPORT

As required in the RD/RA Order, monthly progress reports shall be submitted to the NYSDEC by the tenth of every month to describe the previous month's RD activities. These reports shall be prepared as specified in the executed RD Order.

10.2 LONG-TERM OPERATION PROGRESS REPORT

The long-term operation, maintenance and monitoring progress reports will be submitted as follows:

- i) first two years of SVE operation - monthly;
- ii) second to fifth year of successful operation - quarterly;
- iii) fifth+ years of successful operation - yearly; and
- iv) discharge monitoring reports - monthly.

The PRPs can propose reporting on a less frequent basis than that cited above once the removal rates for the SVE system have been established.

10.3 FINAL ENGINEERING REPORT

Upon completion of the remedial construction activities and the initial startup of the SVE system, a Final Engineering Report shall be prepared to describe the activities performed and will include as-built drawings, a description of all changes made to the Remedial Design during construction, and a certification by a Professional Engineer that the Remedial Design was implemented and all construction activities were completed in accordance with the Department-approved Remedial Design.

10.4 FINAL OMMP

The draft OMMP will be revised and a final OMMP will be submitted to NYSDEC along with the Final Engineering Report.

FIGURES

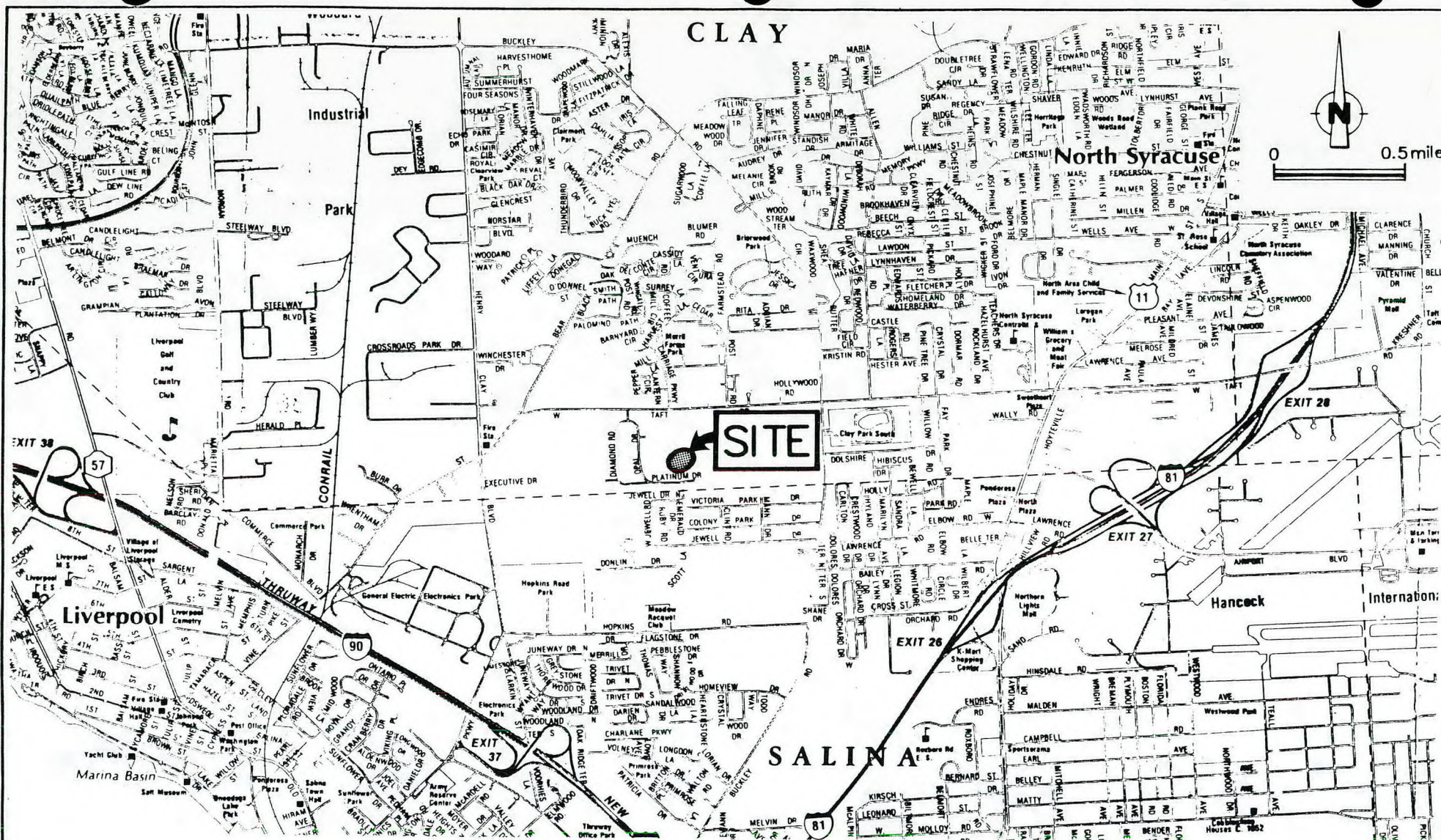
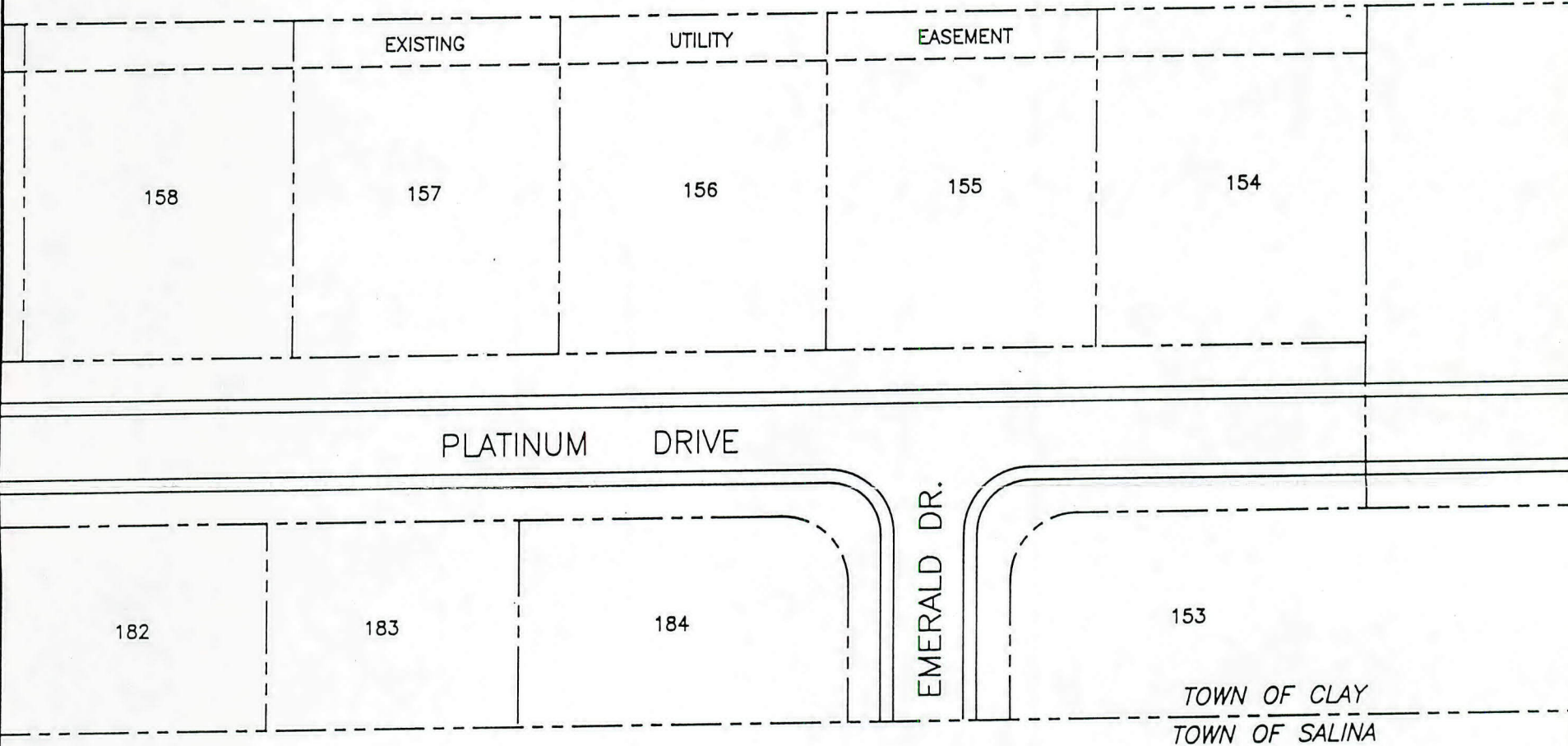
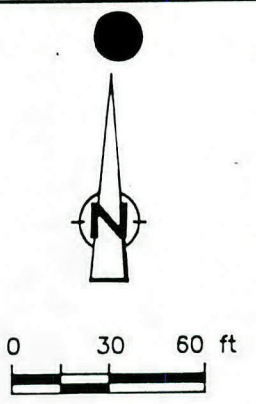
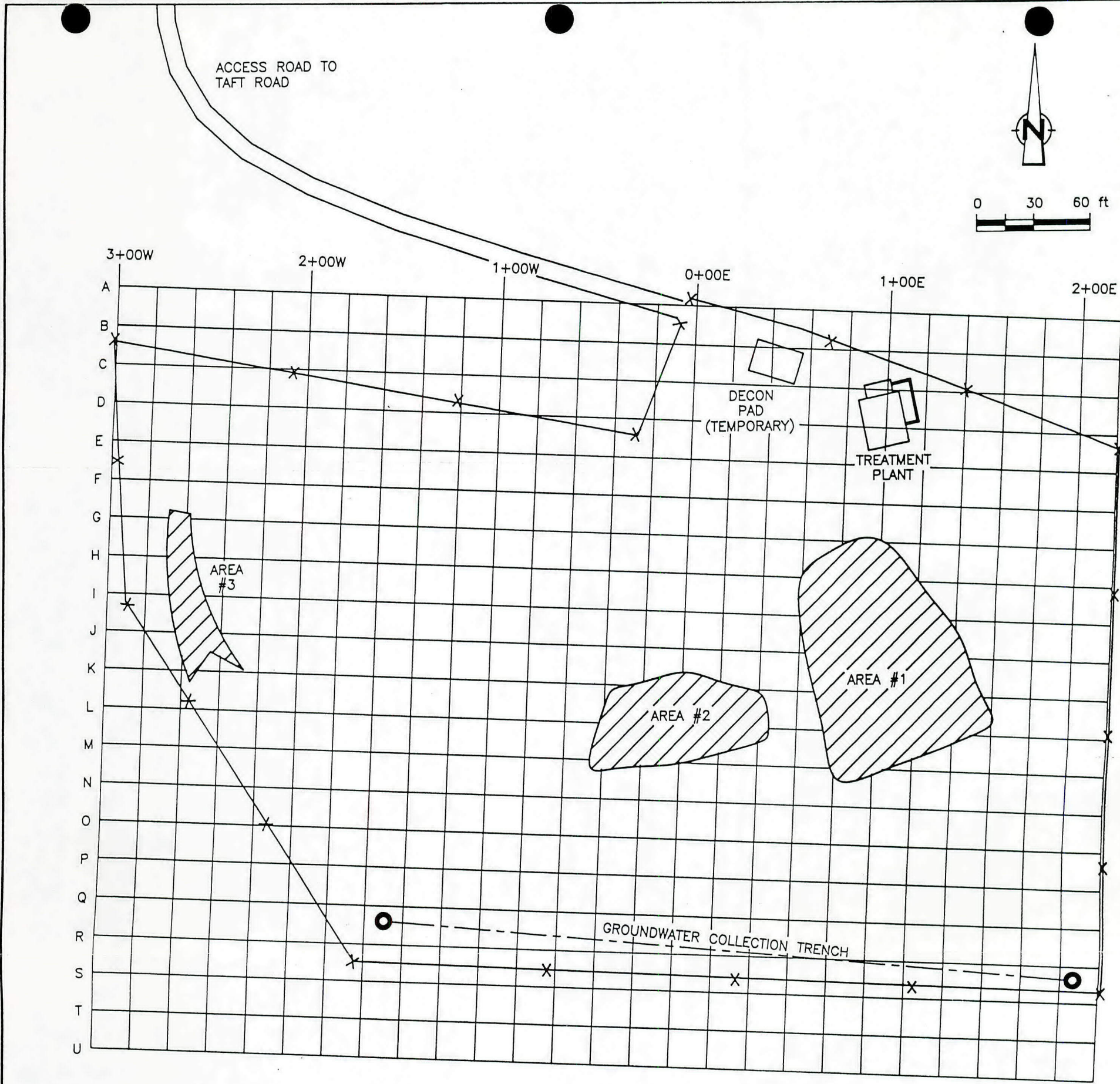


figure 1.1
SITE LOCATION
DUVA PROPERTY
Town of Clay, New York

Treatek - CRA™ COMPANY



LEGEND

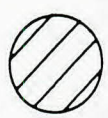
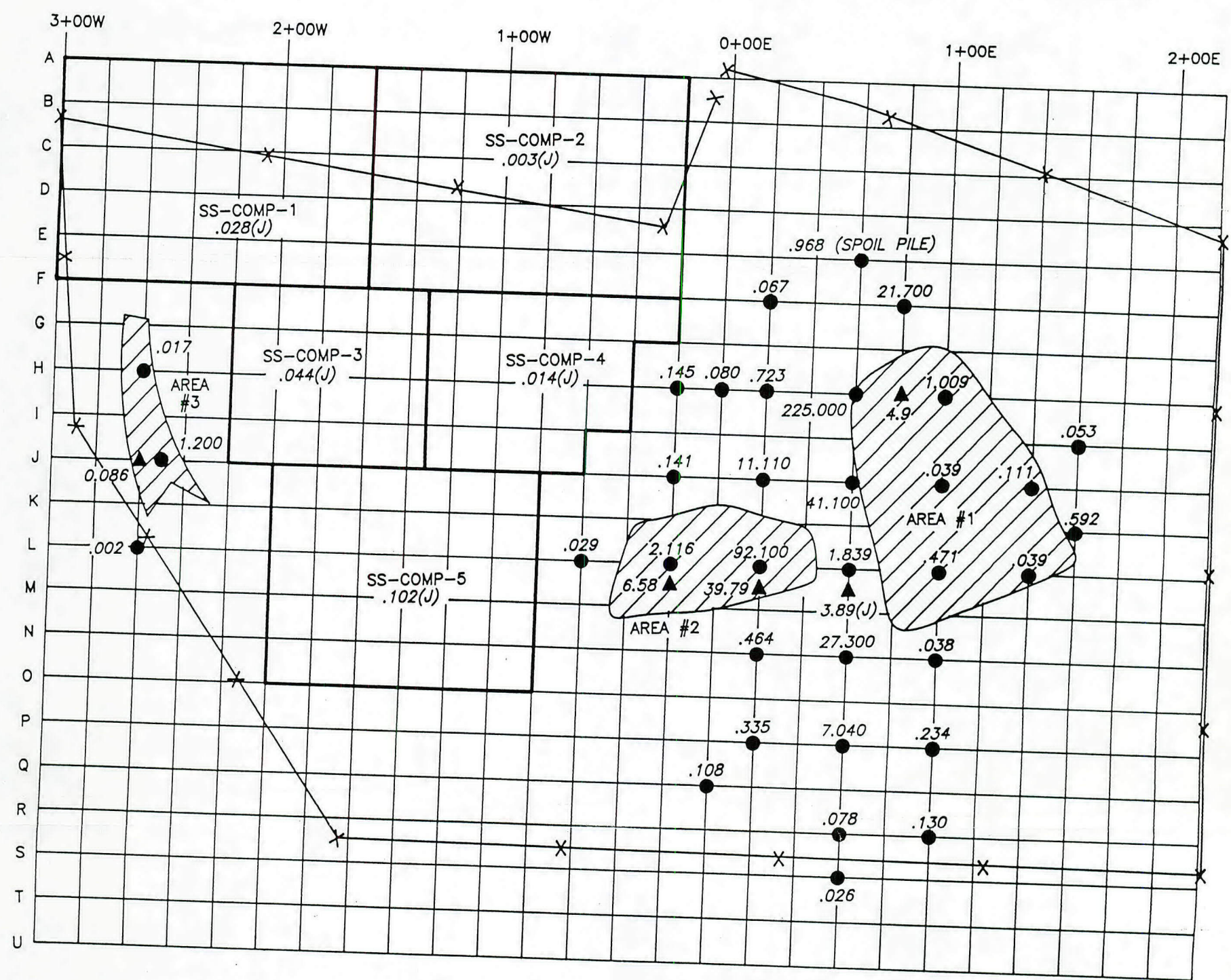
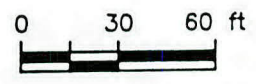
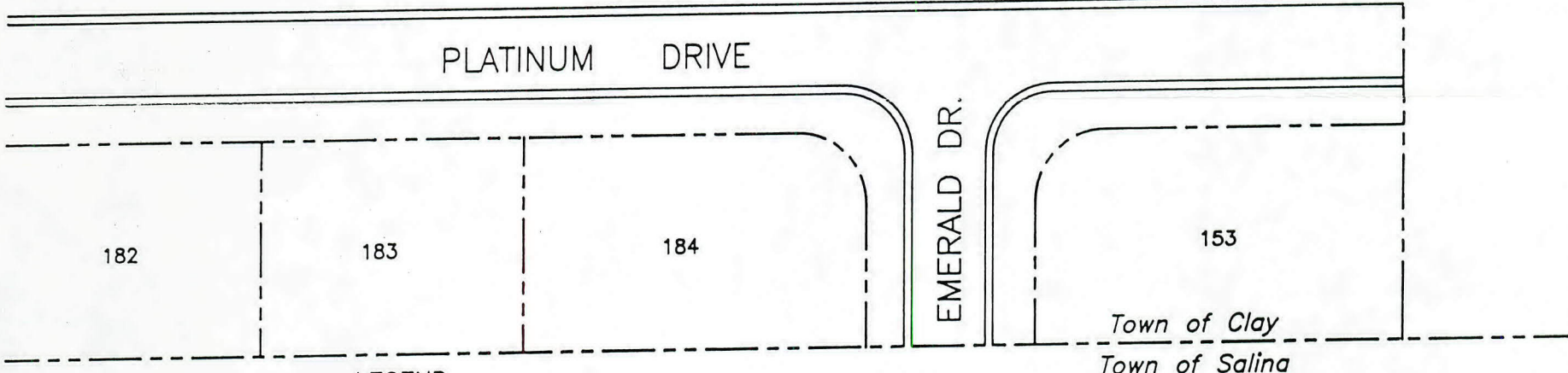
-  APPROXIMATE LOCATION OF FORMER DRUM STAGING AREA

figure 1.2
SITE LAYOUT
DUVA PROPERTY
Town of Clay, New York



	EXISTING	UTILITY	EASEMENT	
158	157	156	155	154



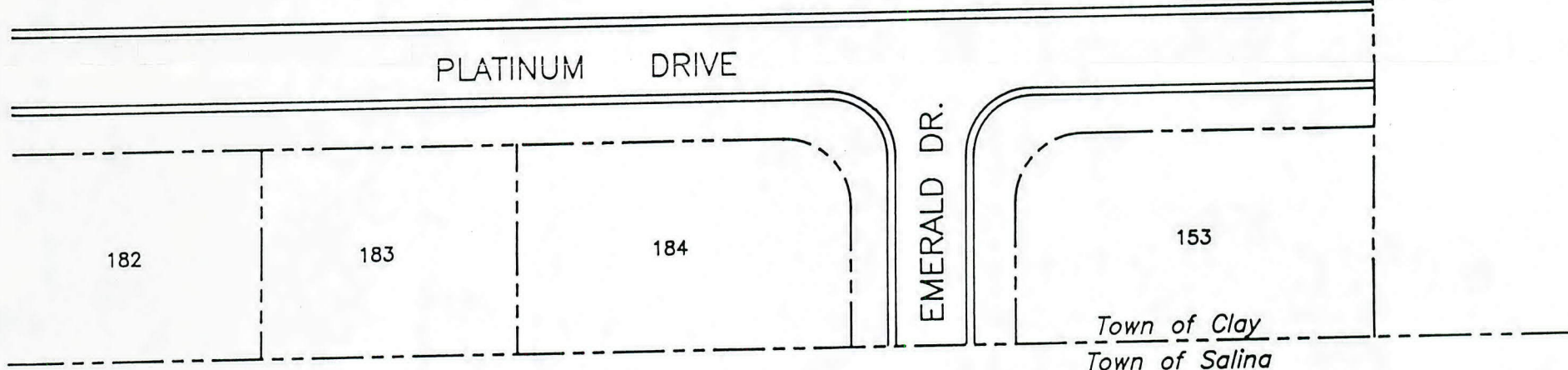
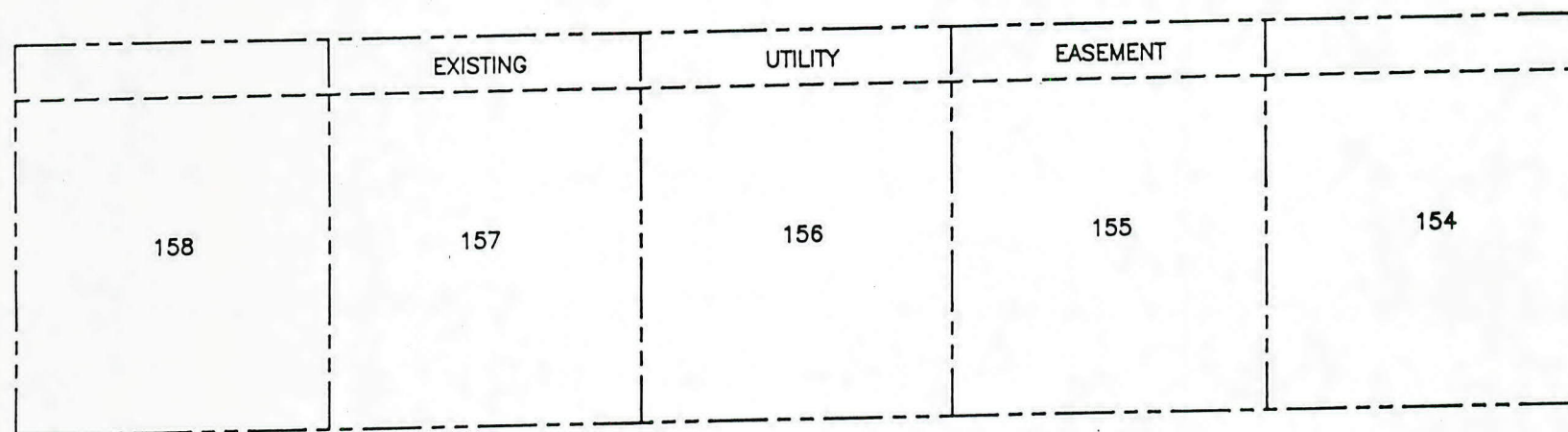
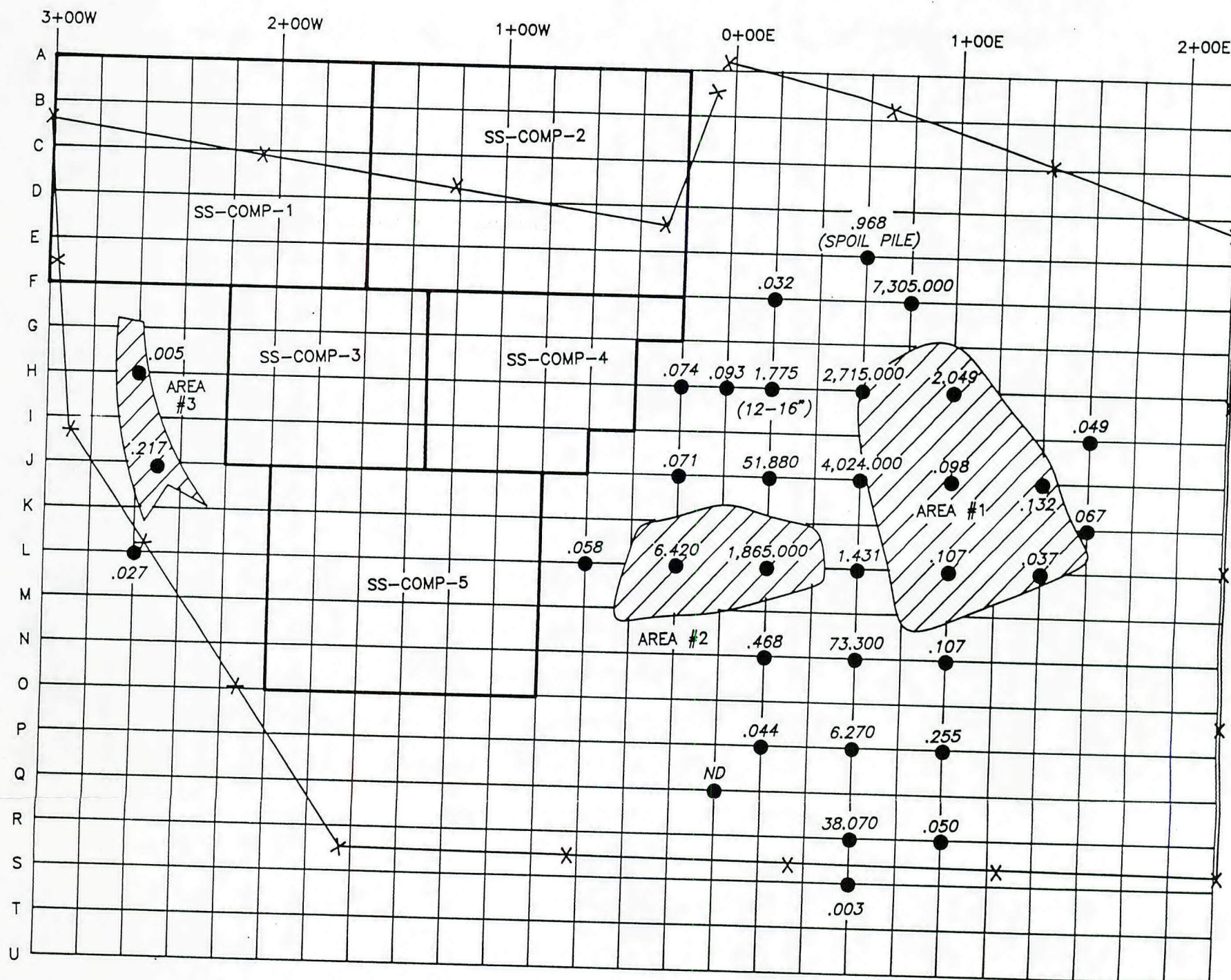
LEGEND

- .145 TOTAL VOC's (ppm)
- J ESTIMATED VALUE
- IRM SURFICIAL SOIL SAMPLING LOCATION
- ▲ RI SURFICIAL SOIL SAMPLING LOCATION - DISCREET SAMPLE
- RI SURFICIAL SOIL SAMPLING LOCATION - COMPOSIT SAMPLE

figure 1.3
TOTAL VOC CONCENTRATIONS
IN SURFACE SOILS (0-6")
DUVA PROPERTY
Town of Clay, New York



0 30 60 ft

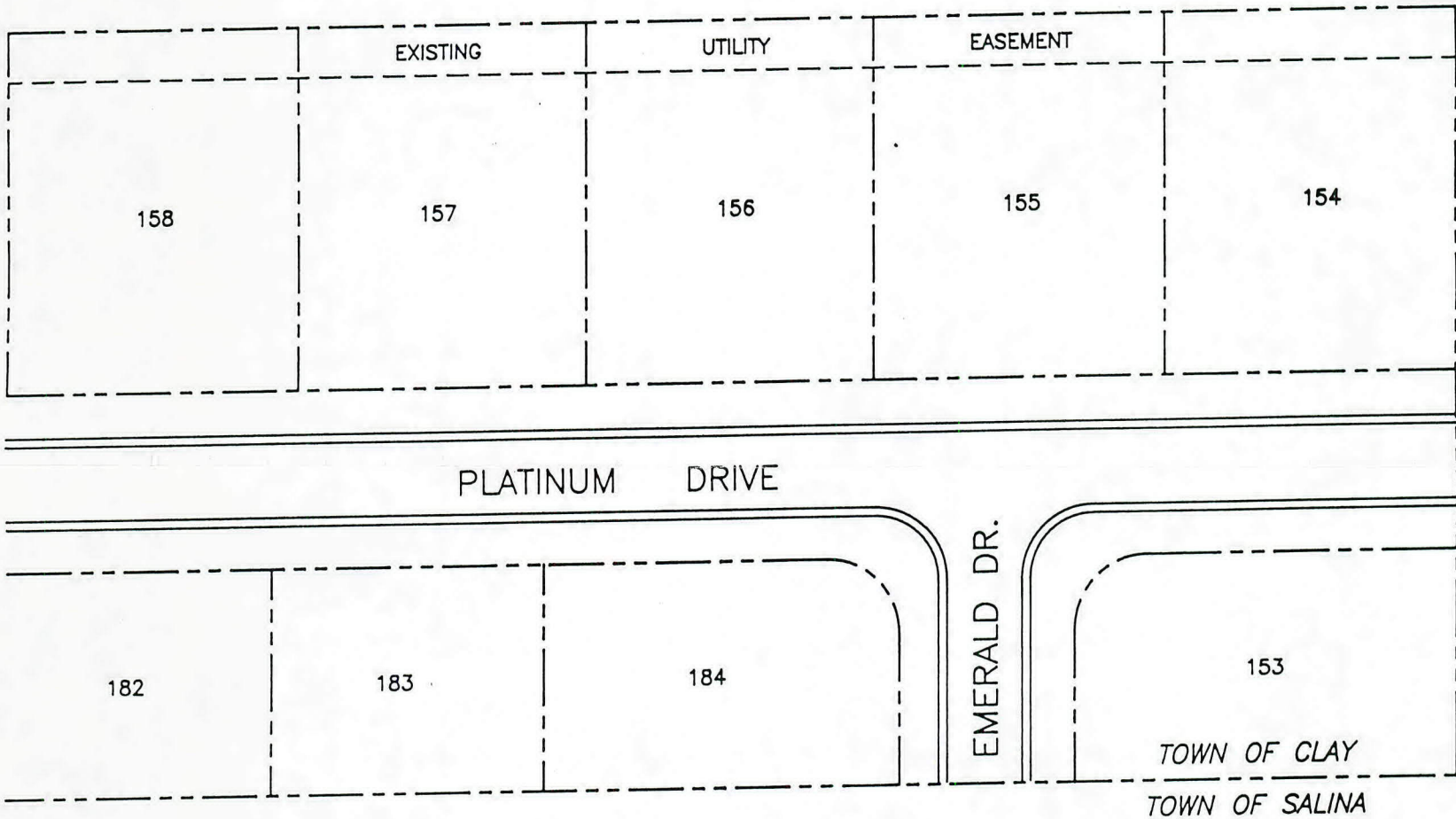
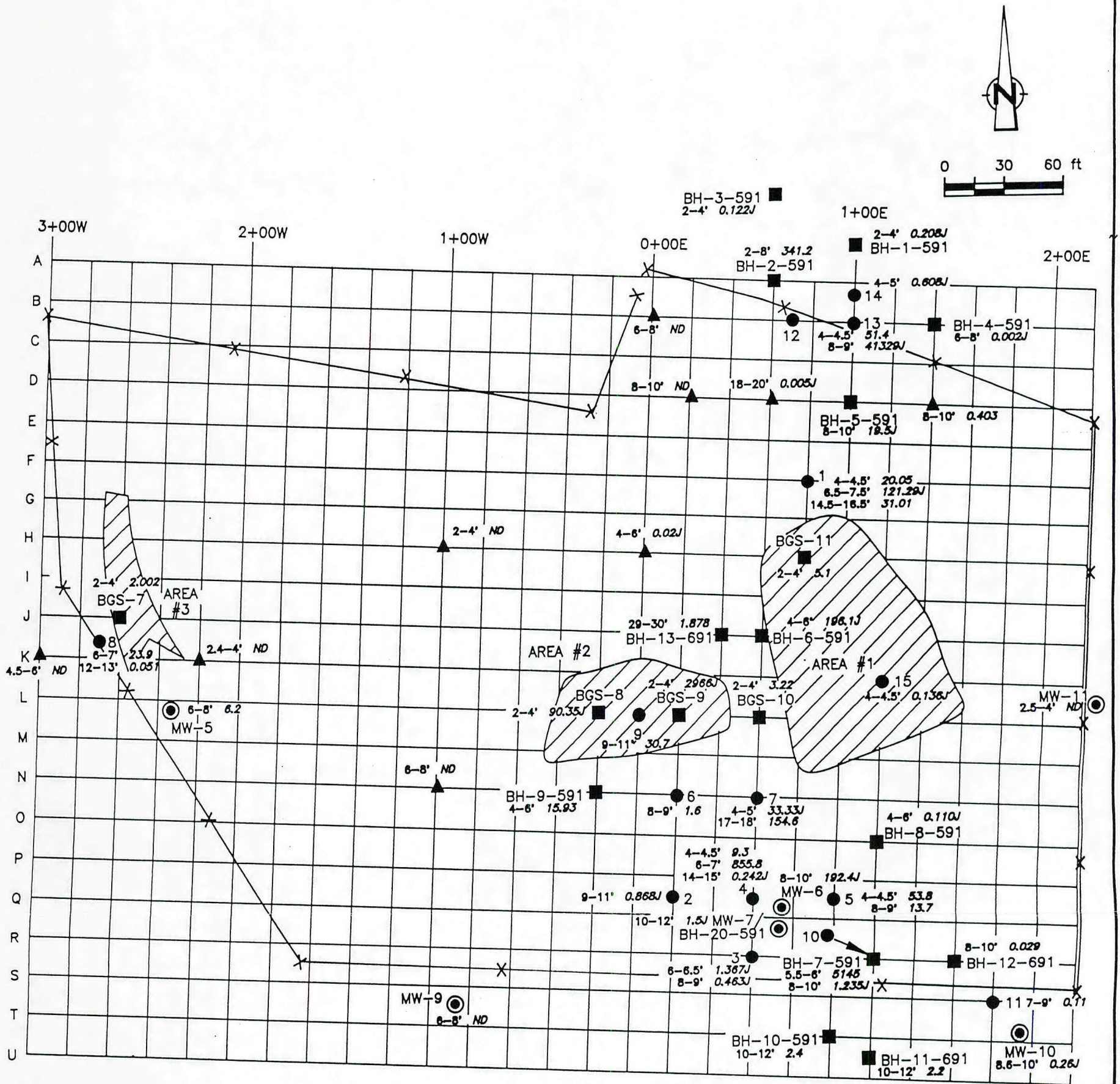


LEGEND

- .108 TOTAL VOC's (ppm)
- IRM SUB-SURFACE SOIL SAMPLING LOCATION
- RI SURFICIAL SOIL SAMPLING LOCATION - COMPOSIT SAMPLE

TregTek - CRATM COMPANY

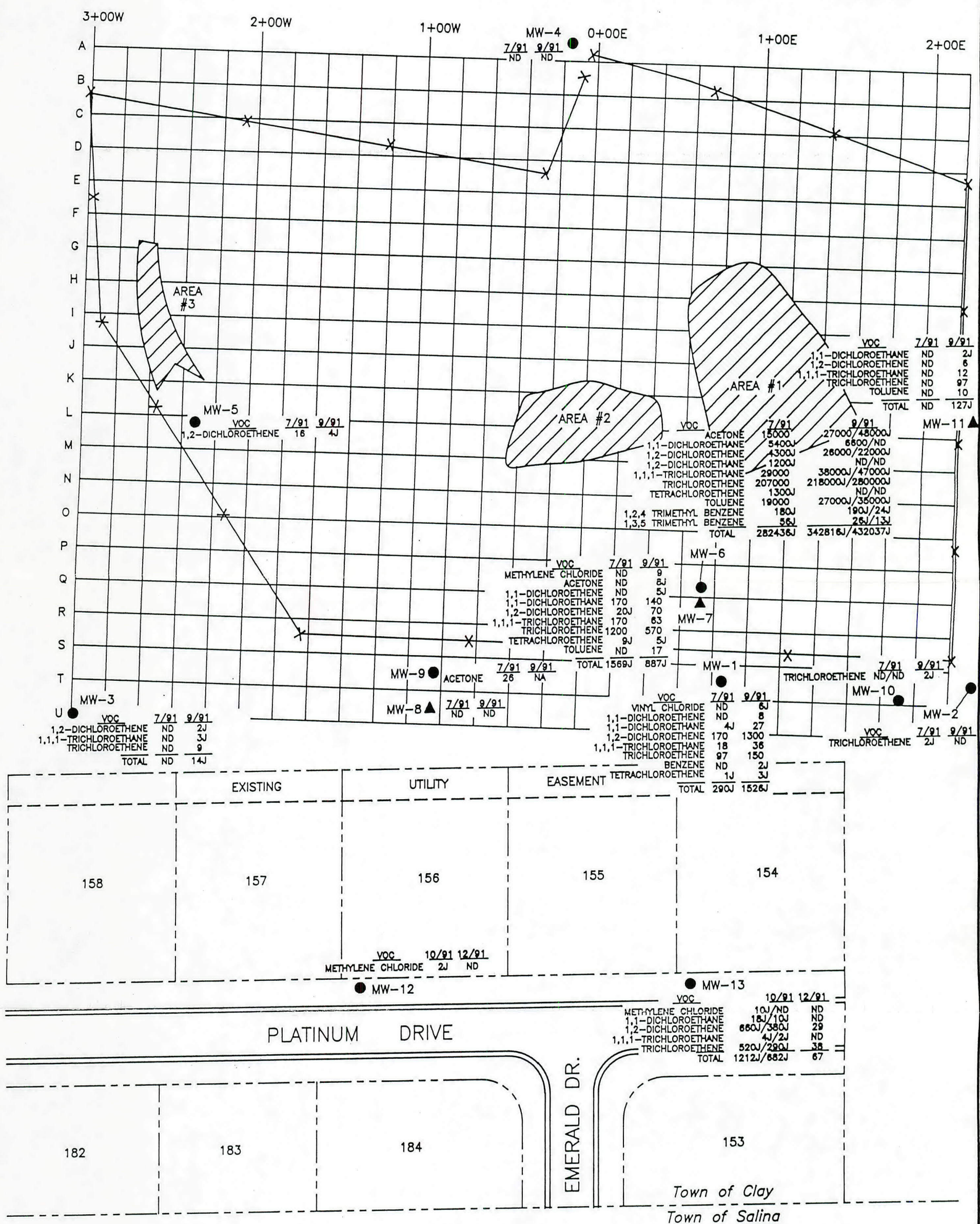
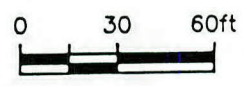
figure 1.4
TOTAL VOC CONCENTRATIONS
IN SUB-SURFACE SOILS (18-30")
DUVA PROPERTY
Town of Clay, New York



LEGEND

- 4 ● IRM BOREHOLE SAMPLING LOCATION
- BH-8-591 ■ RI BOREHOLE SAMPLING LOCATION
- ▲ ADRP BOREHOLE SAMPLING LOCATION
- MONITORING WELL

figure 1.5
TOTAL VOC CONCENTRATIONS (ppm)
IN SUB-SURFACE SOILS (>30")
DUVA PROPERTY
Town of Clay, New York



LEGEND

- MW-4 ● MONITORING WELL COMPLETED IN ALLUVIUM
- J ESTIMATED VALUE
- ▲ MONITORING WELL COMPLETED IN TILL

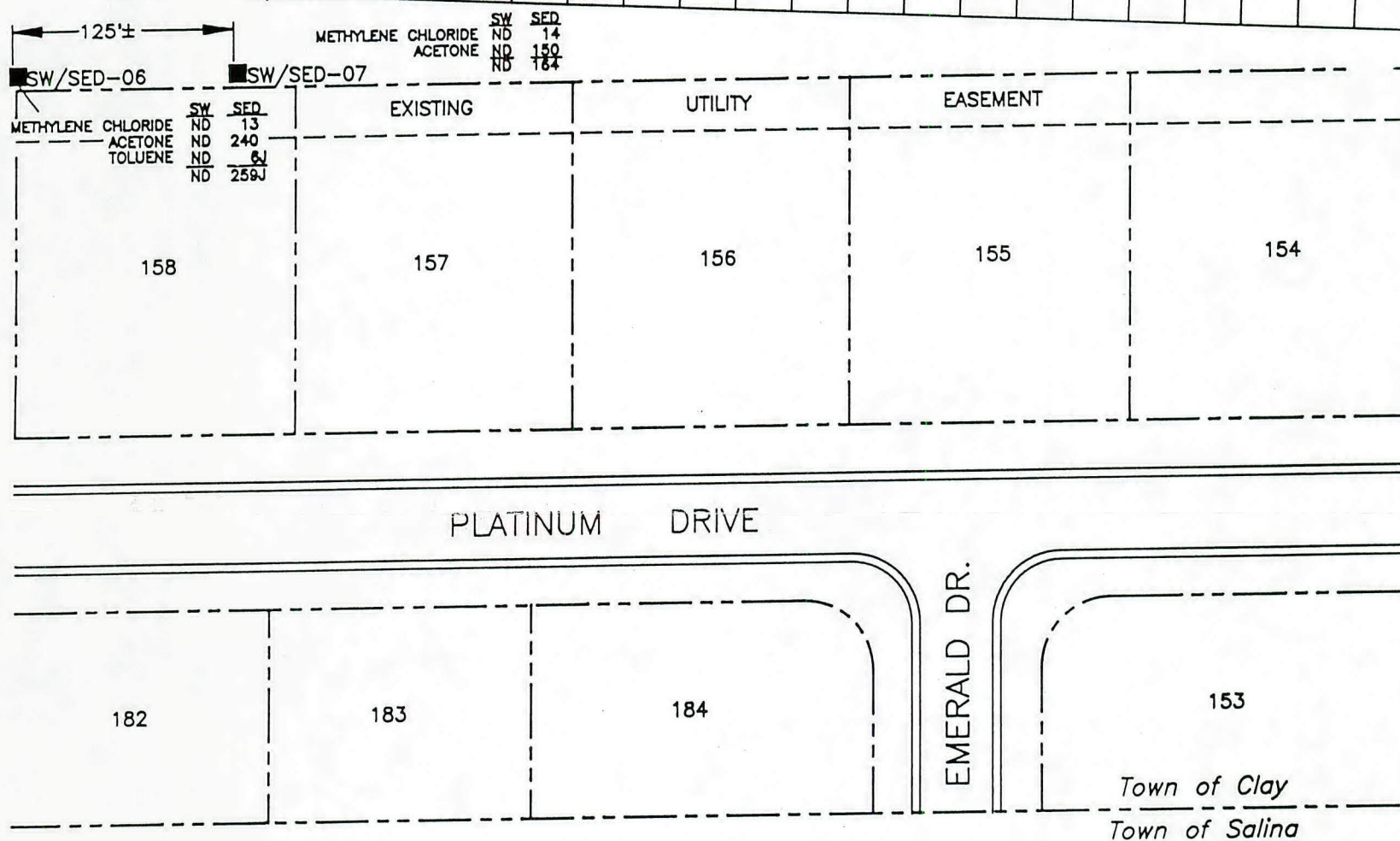
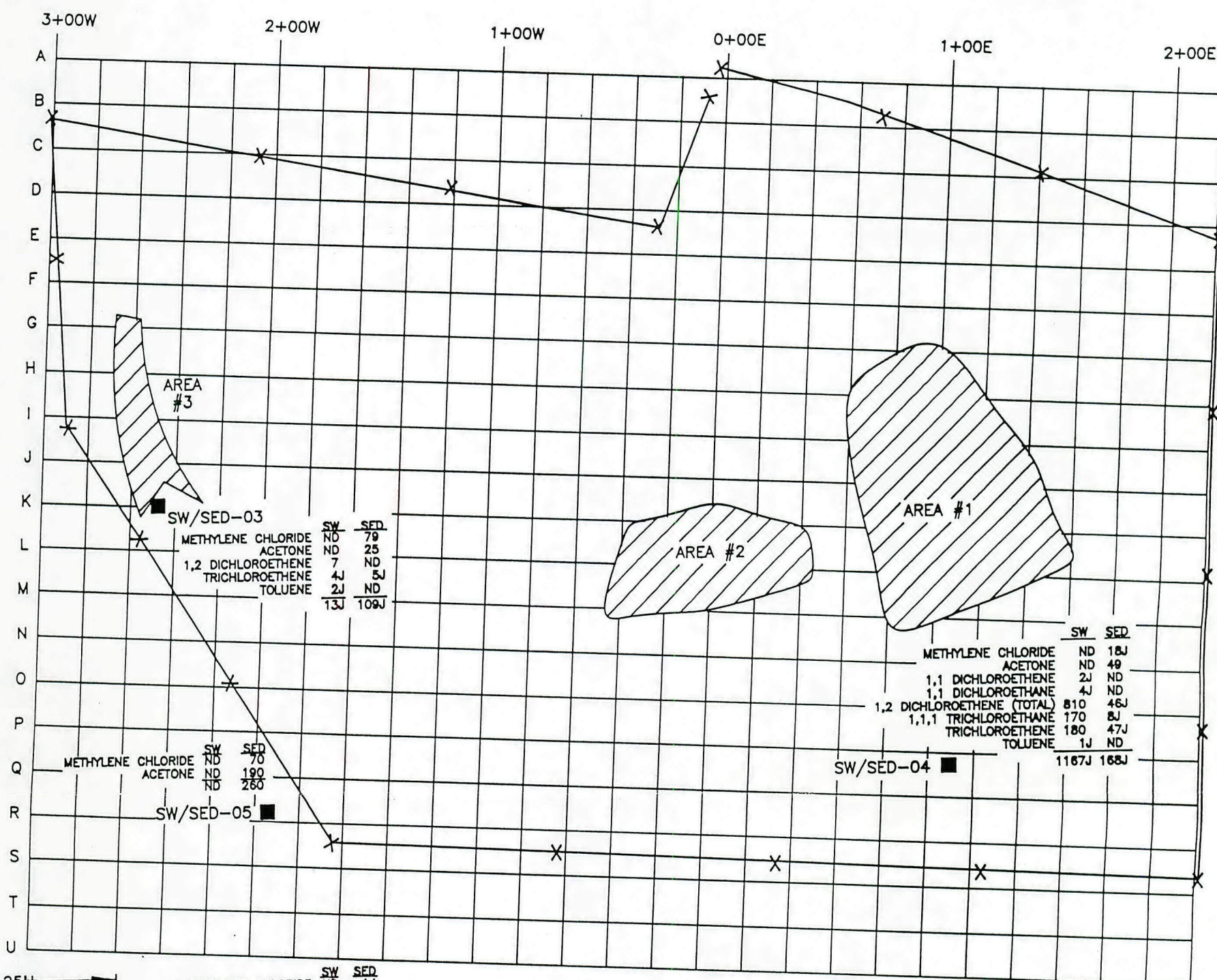
NOTES:

- MW-11 LOCATED 105'± EAST OF GRIDLINE 2+20E
- MW-2 LOCATED 185'± EAST OF SOUTHEAST CORNER OF FENCE
- ALL VOC'S REPORTED IN PPB

figure 1.6
TOTAL VOC CONCENTRATIONS
IN GROUNDWATER
DUVA PROPERTY
Town of Clay, New York



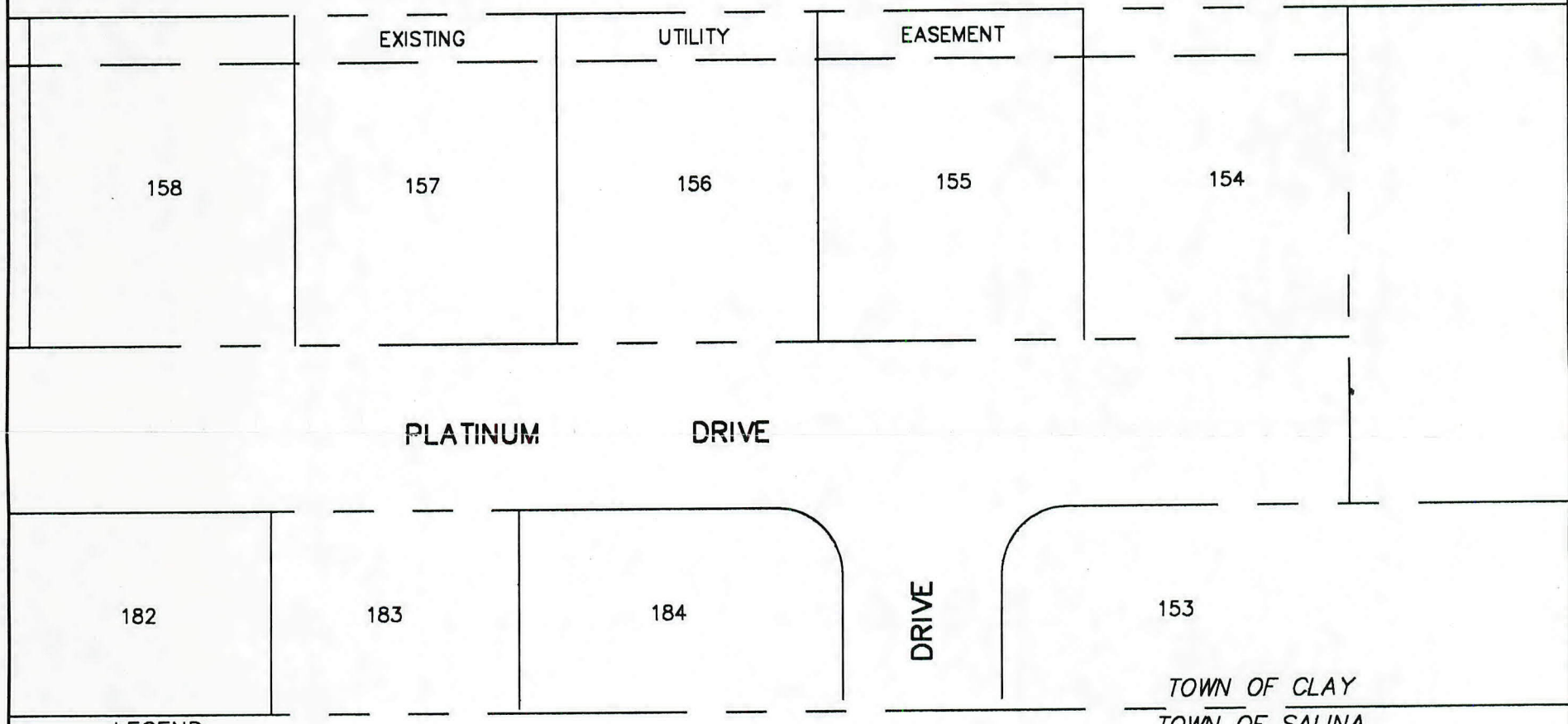
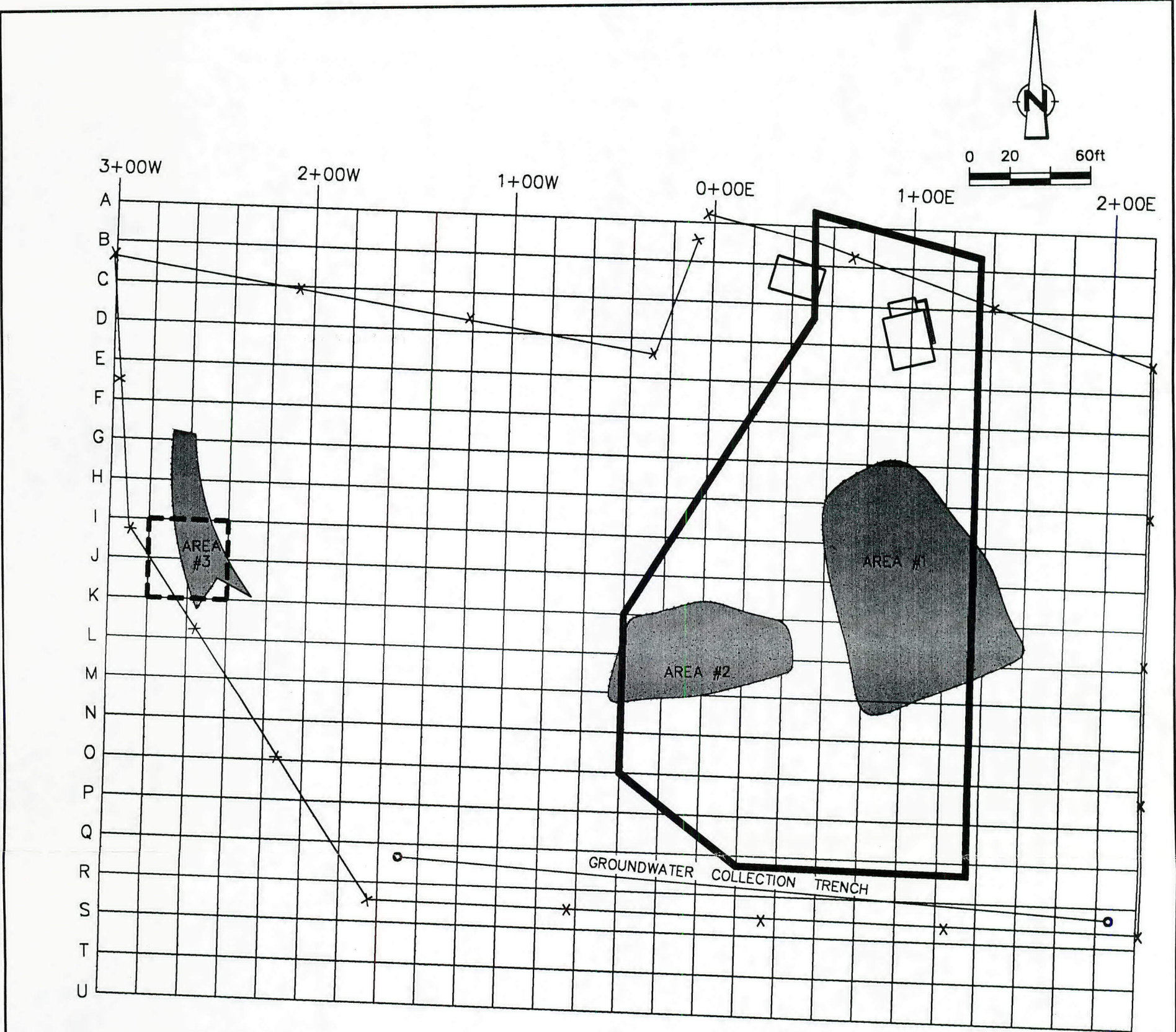
0 30 60 ft



LEGEND

- SW/SED-04 ■ SURFACE WATER/SEDIMENT SAMPLING LOCATION
- 240 TOTAL VOC's (ppb)
- J ESTIMATED VALUE
- ND NOT DETECTED

figure 1.7
TOTAL VOC CONCENTRATIONS
SURFACE WATER AND SEDIMENT SAMPLES
DUVA PROPERTY
Town of Clay, New York



LEGEND

APPROXIMATE LOCATION OF FORMER DRUM STAGING AREA

SVE REMEDIATION AREA

APPROXIMATE LIMITS OF EXCAVATION

Treatek - CRA™ COMPANY

figure 4.1
 AREA #3 AND SVE
 REMEDIATION AREAS
 DUVA PROPERTY
 Town of Clay, New York

DATE ACTIVITY	1993						1994								
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1. RD WORKPLAN APPROVED BY NYSDEC	—	*													
2. SOIL MODIFICATION REPORT															
a) PREPARATION		—	*												
b) REVIEW AND APPROVAL BY NYSDEC			—	*											
3. REMEDIAL DESIGN															
a) IMPLEMENTATION AND RD REPORT PREPARATION	—	—	—	*											
b) RD REPORT APPROVAL BY NYSDEC				—	*										
4. REMEDIAL ACTION															
a) SITE CLEARING					—	—									
b) EQUIPMENT PROCUREMENT/PREPARATION							—	—	—	—					
c) SUBCONTRACTOR PROCUREMENT															
d) FIELD INSTALLATION															
e) START-UP															
f) CONFIRMATION OF PERFORMANCE															
g) REMEDIAL ACTION ALTERNATIVES DEEP SOIL TILLING/MIXING, SOIL FRACTURES AND INTERCPTOR TRENCH)										—	—	—	—	—	
h) RA REPORT AND FINAL OMMP PREPARATION															*
5. MONTHLY REPORTING		*	*	*	*	*	*	*	*	*	*	*	*	*	*

LEGEND

* SUBMITTAL

figure 5.1
RD/RA PROJECT SCHEDULE
DUVA PROPERTY
Town of Clay, New York