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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 174TH FIGHTER WING (ANG)
6001 EAST MOLLOY ROAD
SYRACUSE, NEW YORK 13211-7099

2 July 2008

Mr. Robert Corcoran
Environmental Geologist
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A, 11th Floor
625 Broadway
Albany, New York 12233-7015

RE: Task 6B Deliverable – July 2008 – Final
Engineering Evaluation and Cost Analysis
174th Fighter Wing - Hancock ANG Base
Site 15 Interim Remedial Action
Syracuse, New York

Dear Mr. Corcoran:

On behalf of the 174th Fighter Wing at the Hancock Air National Guard Base, Environmental Resources Management (ERM) is pleased to provide the New York State Department of Environmental Conservation (NYSDEC) with one copy and one computer disk (CD) containing the above referenced Final Engineering Evaluation and Cost Analysis (EE/CA) dated July 2008. The Draft Final EE/CA did not have to be revised based on telephone conversations by ERM with Air National Guard (ANG) and NYSDEC project managers on 1 July 2008.

If you have any questions, please contact me on my office phone at (315)233-2111.

Sincerely;

Timothy C. Sager, Civ, NYANG
Environmental Manager

Environmental Resources Management

5788 Widewaters Parkway
DeWitt, New York 13214
315-445-2554
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2 July 2008

Veronica L. Allen, P.E.
BB&E, LLC
37610 Hills Tech Drive
Farmington Hills, MI 48331

Subject: Task 6B Deliverable – July 2008 – Final Engineering Evaluation and Cost Analysis
174th Fighter Wing - Hancock ANG Base
Site 15 Interim Remedial Action
Syracuse, New York

Re: Contract Number DAHA92-01-D-0005
Delivery Order 0033
ERM Project Number 0020534

Dear Ms. Allen:

As requested by the Air National Guard (ANG), Environmental Resources Management (ERM) is pleased to provide the BB&E, LLC with one copy of the Final Engineering Evaluation and Cost Analysis. The complete document has been included for ease of reference. A computer disk (CD) with the complete Draft report is also included for your use.

The Draft Final EE/CA did not have to be revised as no public comments were received during the 1 to 30 June 2008 public notice period. In addition, based on telephone conversations by ERM with ANG and New York State Department of Environmental Conservation (NYSDEC) project managers on 1 July 2008, no agency comments were requested.

Thank you for the continued opportunity to support ANG. Please contact me at 518-461-8936 or dave.myers@erm.com if you have any questions or comments.

Sincerely,

David W. Myers

David W. Myers, C.G.
Project Manager

Attachments

Cc: Ms. Jody Murata (ANG Program Manager)

Environmental Restoration Program
Final Engineering Evaluation/Cost Analysis
Site 15 Interim Remedial Action

174th Fighter Wing
New York Air National Guard
Hancock Air National Guard Base
Syracuse, New York

July 2008

Air National Guard

Andrews AFB, Maryland
Environmental Restoration Program
Final Engineering Evaluation /Cost Analysis
Site 15 Interim Remedial Action

174th Fighter Wing
New York Air National Guard
Hancock Air National Guard Base
Syracuse, New York

July 2008

Prepared For:

Air National Guard
Andrews AFB, Maryland
Contract No. DAHA92-01-D-005
Delivery Order 0033

Prepared By:

Environmental Resources Management
5788 Widewaters Parkway
DeWitt, New York 13214

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LIST OF ACRONYMS

Acronym	Definition
ANG	Air National Guard
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ECL	Environmental Conservation Law
EE/CA	Engineering Evaluation/Cost Analysis
ERM	Environmental Resources Management
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FW	Fighter Wing
NYSDEC	New York State Department of Environmental Conservation
PID	Photoionization Detector
ppm	Parts per million
RAO	Removal Action Objective
RSCO	Recommended Soil Cleanup Objective
VOC	Volatile Organic Compound

Executive Summary

EXECUTIVE SUMMARY

Environmental Resources Management (ERM) has developed this Engineering Evaluation/Cost Analysis (EE/CA) for the the 174th Fighter Wing (FW) of the New York Air National Guard, located at the Hancock Air National Guard Base in DeWitt, New York. This EE/CA was performed in support of a planned interim remedial action at Environmental Restoration Program (ERP) Site 15.

During remedial investigation activities conducted in 2006, elevated photoionization detector (PID) readings and visual evidence of residual petroleum (sheen) were noted in soil overlying the groundwater table within the former pump house area at Site 15. A total of 44 soil borings were installed during a supplemental remedial investigation in August 2007 to delineate the extent of the source area located above saturated soil at Site 15. Photoionization detector results from soil screening in the unsaturated zone ranged from not-detected to 1,754 parts per million (ppm).

One of ten soil samples submitted for laboratory analyses contained compounds of potential concern at concentrations exceeding applicable soil cleanup objectives. Specific volatile organic compounds (VOCs) that exceeded Recommended Soil Cleanup Objectives (RSCOs) established in Part 375 by the New York State Department of Environmental Conservation (NYSDEC) included benzene, ethylbenzene, and total xylenes. Residual petroleum (sheen) was also observed on water following agitation testing in soil samples screened at PID readings of 628 ppm and greater. This residual sheen classifies the soil as "grossly contaminated". The NYSDEC requires remediation of "grossly contaminated soil" during source removal actions. The estimated volume of petroleum-affected soil recommended for removal at Site 15 is approximately 2,000 cubic yards or 3,000 tons. The presence of this mass of residual petroleum in soil overlying groundwater could have a significant negative effect on the effectiveness of planned future groundwater remediation.

The purpose of this EE/CA is to evaluate long term solutions to reduce or eliminate the majority of unsaturated zone petroleum-affected soil in the Site 15 source area in order to reduce the potential threats to human health and the environment and to identify the most cost effective remedial alternative. The EE/CA identifies the objectives of the removal action,

identifies and evaluates several alternative solutions, and recommends the best alternative according to the evaluation criteria. The following three alternatives were developed to address removal action objectives for remediation of petroleum-affected soil in the source area at Site 15:

- Alternative 1 - No Action
- Alternative 2 – Soil Excavation and Off-Site Disposal
- Alternative 3 – Soil Excavation and On-Site Treatment

According to guidance provided by the Environmental Protection Agency (EPA), removal action alternatives are evaluated based on their effectiveness, implementability, and cost. These evaluation criteria ensure that each alternative developed will be effective in protecting human health and the environment, will be technically and administratively feasible, and will be cost effective.

Alternative 2 (Soil Excavation and Off-Site Disposal) is the recommended removal action alternative. This alternative provides the most reliable long-term source control action and provides the most effective protection of human health and environment. This alternative is both technically and administratively implementable and requires no long-term maintenance or monitoring on the part of the individual residents. Alternative 2 is also the most cost effective and time critical active removal action evaluated.

The *Draft Final EE/CA* report was made available to the public for a 30-day public comment period starting 1 June 2008. No comments were received during the 30-day public comment period or at the public meeting held on 26 June 2008.

SECTION 1.0

INTRODUCTION

This EE/CA has been prepared for a planned soil removal action at the 174th Fighter Wing FW of the New York Air National Guard (ANG) at the Hancock ANG Base in Dewitt, New York. This report was completed under National Guard Bureau contract DAHA92-01-D-0005, Delivery Order 0033, Addendum Number 2 between ERM and the National Guard Bureau, Departments of the Army and Air Force.

1.1 Purpose and Scope of the EE/CA

The purpose of this EE/CA is to evaluate long term solutions and identify the most cost effective alternative to mitigate petroleum-affected soil in the Site 15 source area in order to reduce potential threats to human health and the environment. The EE/CA identifies the objectives of the removal action, identifies and evaluates several alternative solutions, and recommends the best alternative according to the evaluation criteria.

Removal actions for soil source area contamination at Site 15 will be conducted under the ANG's ERP in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance. This EE/CA report was prepared according to the EPA guidance document entitled *Guidance on Conducting Non-Time Critical Removal Actions under CERCLA* (EPA 1993) and the *Environmental Restoration Program Investigation Guidance* document (ANG 2005).

1.2 Statutory Authority

The ANG has solicited and received input from the State of New York during the performance of all ERP activities at the 174th FW. The NYSDEC is the lead regulatory agency providing oversight for all ERP activities.

Section 2

Section 2

SECTION 2.0

SIZE CHARACTERIZATION

Following is a general description of environmental conditions at the 174th FW. A site location map is presented as Figure 2-1, and the Site 15 and off-site investigation areas are shown in detail on Figure 2-2.

2.1 Site Description and History

The 174th FW of the New York ANG is based at Hancock Field, an active international airport and a former Air Force Base located two miles north-northeast of the City of Syracuse in Onondaga County in central New York. The 174th FW supplies air reconnaissance for the eastern portion of the United States. The ANG facility is currently operating within the southern portion of the former Hancock Air Force Base located south of the municipal airport. Facilities on the base include hangers, support buildings, office buildings, and maintenance buildings. Hancock ANG is bordered by the airport to the north, the Town of Dewitt to the east and south, and the Town of Salina to the west.

Site 15 was formerly used as a pump house for the Petroleum, Oil and Lubricants area. It is approximately 2.5 acres in area, and consists of brush and wooded vegetation, a large concrete pad, a formerly bermed area where a 215,000-gallon aboveground tank was located, and two drainage swales. One drainage swale borders the site along the north-northeast side, and a second borders the west side of the site. The drainage swales contain water intermittently following storm events. Water within the drainage swales does not appear to be hydraulically connected to underlying groundwater (Parsons, 2004).

Site 15 has sustained spills of polychlorinated biphenyls and JP-4 and JP-8 military aviation fuels over the years. Several site structures were removed in 2003 as part of a removal action for polychlorinated biphenyl-impacted soils, including a transformer pad, the foundation of the former pump house, six underground tanks, three drainage sumps, and an oil-water separator (Parsons, 2004).

2.1.1 Surrounding Land Use

The surrounding land use is currently a mixture of transportation with the Syracuse Hancock International Airport, recreational, industrial, commercial, and a handful of residences within one-quarter mile downgradient (south) of the site. Lands to the west, north, and east of the 174th FW are used for military and transportation purposes that have continued for decades. Land directly to the south of Site 15 across Molloy Road is used for a golf course. Overall land use in the site vicinity has not changed significantly in the last 30 to 40 years and is not expected to change significantly in the foreseeable future.

2.2 Geology

The surficial geology at Site 15 consists of glaciofluvial sediments deposited by glacial meltwater overlying poorly sorted till deposited directly by glaciers. The glaciofluvial sediments include silty clays, sands, and gravels, with thickness ranging from 45 to 55 feet. The underlying till consists of gravel, cobbles, and boulders entrained in a silty clay matrix and ranges in thickness from 30 to 100 feet (Lockheed, 1997).

Bedrock is encountered at depths ranging from 75 to 109 feet below ground surface, and is one of the Upper Silurian Vernon Formation. This formation consists of thinly bedded soft red shale with thin beds of green shale, gypsum, halite, and dolomite. Competence varies from soft and crumbly to dense and hard. The degree of competence appears to be proportional to the density of the fractures in the shale. The shale is characterized by enlarged fractures, joints, and bedding planes (Lockheed, 1997).

2.3 Hydrogeology

The overburden at Site 15 consists of fine-grained sediments. The subgrade soils are fairly uniform, with the upper 10 to 15 feet of the soil characterized by relatively soft, dark yellowish-brown silt and silty clay. Towards the southeast the interval thins to approximately 5 feet. Beneath the silty clay are fine- to medium-grained sands, yellowish brown to dark brown with silt, and trace amounts of clay down to a depth of approximately 20 feet. Underlying these silty sands is a lens of stiff clayey silts (often called glacial till). Till was encountered was as much as 15 feet thick (Lockheed, 1997).

2.4 Summary of Remedial Investigation Results

During remedial investigation activities conducted in 2006, elevated PID readings and visual evidence of residual petroleum (sheen) were noted in soil overlying the groundwater table within the former pump house area at Site 15. A total of 44 soil borings were installed during a supplemental remedial investigation in August 2007 to delineate the extent of the source area located above saturated soil at Site 15. PID results from soil screening in the unsaturated zone ranged from not-detected to 1,754 ppm in the soil borings at Site 15.

Ten soil samples were selected for laboratory analysis based on field observation at the sample location and also to cover the full spectrum of recorded VOC concentrations measured in the field with a calibrated PID. One of the ten soil samples contained compounds of potential concern at concentrations exceeding recommended soil cleanup objectives (RSCOs) for protection of ground water as outlined in NYSDEC Part 375-6.8(b). Specific VOCs that exceeded RSCOs include benzene (SB-10@ 3' bgs at .67 ppm), ethylbenzene (SB-10@ 3'bgs at 25ppm), and total xylenes (SB-10@ 3' at 90ppm) .

2.4.1 Nature and Extent of Contamination

As stated above, specific VOCs exceeding RSCOs in Site 15 soils include benzene, ethylbenzene, and total xylenes. Soil water agitation testing was also conducted on seven soil samples representing the range of PID concentrations detected in the field. The results are summarized in the following table.

BORING ID	FIELD SCREENED (PPM)	SHEEN PRESENT
SB-32-8	0	NO
SB-16-8	60	NO
SB-2-6.5	143	NO
SB-1-2.5	225	NO
SB-17-6	628	YES
SB-7-5	1,498	YES
SB-28-14.5	2,167	YES

Residual petroleum (sheen) was observed on water following the agitation testing in soil samples screened at PID readings of 628 ppm and greater. The NYSDEC requires remediation of "grossly contaminated soil" during source removal actions. Grossly contaminated soil contains "visibly identifiable or otherwise readily detectable free or residual product" as defined in the NYSDEC Division of Environmental Remediation guidance document entitled *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002).

ERM used the laboratory data, results of the sheen testing and input from the ANG to define areas of petroleum-affected soil in the unsaturated zone. Those areas were defined as Areas A, B, and C as shown on Figure 2-3 and listed in the table below. Based on the dimensions and impacted depths of those areas, the estimated volume of petroleum-affected soil requiring remediation or removal is approximately 2,000 cubic yards or 3,000 tons.

Area ID	Size	Zone of affected Soil	Thickness	Volume
A	230′ x 30′	2′-7′	5′	1,280 yd^3
B	80′ x 30′	0′-5′	5′	450 yd^3
C	80′ x 30′	4′-7′	3′	270 yd^3

2.5 Risk Evaluation

Based on the analytical data collected in the Site 15 Source area (ERM 2008), an unacceptable risk currently exists in the areas defined on Figure 2-3. That risk involves continued leaching of benzene, ethylbenzene and total xylenes to the groundwater which could result in concentrations exceeding NYSDEC groundwater standards and continued expansion of the groundwater plume. Additional risks exist in the form of dermal contact and inhalation of vapors through contact associated with future construction activities in this area. A removal action is required to address petroleum-affected soil prior to initiating enhanced bioremediation of groundwater and prior to planned mission-critical construction of administrative facilities in 2009.

Section 3

Section 3

SECTION 3.0

IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

The following sections summarize the remedial action objectives (RAOs), scope, schedule, and applicable, relavant and appropriate requiredments (ARARs) for a planned soil removal action in the Site 15 source area.

3.1 Removal Action Objectives

The overall RAO is to remove soil overlying the groundwater table at Site 15 containing benzene, ethylbenzene, and total xylenes at concentrations exceeding RSCOs. This objective will facilitate protection of human health and the environment by preventing leaching of benzene, ethylbenzene, and total xylene to groundwater and by decreasing potential exposure pathways (ingestion, inhalation, and dermal contact) for site workers and visitors.

3.2 Removal Action Scope

The removal action scope includes excavating the petroleum-affected soil defined by Areas A, B, and C (Figure 2-3) and and managing/disposing of excavated material acording to all applicable federal, state and local guidelines. Excavated soil meeting the criteria specified in Section 3.4.2, supplemented with imported clean fill material, will be used to backfill the excavation in compacted lifts to pre-excavation grade. Proper drainage and revegetation will be established as necessary. Dewatering of soil will not be necessary as the excavations will only proceed to the depth of the water table, estimated at 7 feet below ground surface (bgs).

3.3 Removal Action Schedule

Following approval of the EE/CA, an Action Memorandum detailing the selected removal action will be prepared and submitted for review and

approval. Upon approval of the Action Memorandum by the NYSDEC, an Interim Remedial Action Work Plan will be prepared, with implementation of the soil removal action scheduled for July 2008.

3.4 Applicable or Relevant and Appropriate Requirements

A soil removal action is needed based on planned mission-critical construction at Site 15 in fiscal year 2009. This removal action will be implemented under the ERP, which incorporates requirements of CERCLA and subsequent amendments. All CERCLA remedial actions must, to the extent practicable, comply with promulgated Federal and State ARARs (40 Code of Federal Regulations 300.415 [j]). CERCLA remedial actions must meet the following criteria:

- Assure the protection of public health, welfare, and the environment;
- To the extent practicable, provide for the control and management and cleanup of hazardous (and non-hazardous or petroleum-affected) substances so as to allow maximum beneficial use of the Site and eventually beneficial use of groundwater; and
- Be cost effective over the period of potential exposure to such petroleum-affected substances.

3.4.1 Chemical-Specific ARARs

The chemical-specific ARARs for the planned soil removal action are the NYSDEC Remedial Program Soil Cleanup Objectives (RSCOs) for protection of ground water as outlined in NYSDEC Part 375-6.8(b). The RSCOs for protection of groundwater for the Site 15 chemicals of concern are listed below.

- Benzene: 0.06 ppm
- Ethylbenzene: 1.0ppm
- Total Xylenes: 1.6 ppm

3.4.2 Action/Location-Specific ARARs

The *Petroleum-Contaminated Soil Guidance Policy* states that excavated soil may be used to backfill an excavation if the excavated soil does not

contain compounds of potential concern at concentrations exceeding the applicable RSCOs, and as long as the soil does not exhibit objectionable nuisance characteristics (NYSDEC 1992). The protection of ground water RSCOs are more stringent than the RSCOs for the protection of human health. Therefore, laboratory analytical results for excavated soil will be compared to groundwater protection RSCOs for purposes of evaluation of the suitability of the excavated soil for reuse as backfill.

Section 4

Section 4

SECTION 4.0

IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The following sections describe the removal action alternatives developed to address RAOs for the Site 15 soil removal action. These removal action alternatives are each evaluated based on their effectiveness, implementability, and cost.

4.1 Identification of Removal Action Alternatives

The following three alternatives were developed to address RAOs based on land use considerations, data from previous investigation activities at Site 15, and consideration of NYSDEC and EPA guidance on remedial action selection:

- Alternative 1 - No Action
- Alternative 2 - Soil Excavation and Off-Site Disposal
- Alternative 3 – Soil Excavation and On-Site Treatment

These alternatives are described in the following subsections.

4.1.1 Alternative 1 – No Action

Under Alternative 1, no removal action would be implemented and elevated levels of benzene, ethylbenzene, and total xylenes would remain in the source area and continue to impact groundwater. This alternative does not provide additional protection of human health or the environment from the impacted groundwater.

4.1.2 Alternative 2 – Soil Excavation and Off-Site Disposal

Under Alternative 2, petroleum-affected soil will be removed based on field screening for total VOCs augmented by soil-water agitation testing

for residual petroleum. The removal action would generally be performed as follows:

1. Remove soil containing separate- and/or residual-phase petroleum and/or soil with PID readings generally exceeding 628 ppm. The final limits of excavation will be based on floor and wall confirmation samples as presented in NYSDEC Draft DER-10 (2002). There is an estimated volume of approximately 2,000 cubic yards or 3,000 tons (see Figure 2.3);

2. Dewatering of soil will not be necessary as the excavations will only proceed to the depth of the water table estimated at 7 feet bgs;

3. Manage and dispose excavated material at an off-site non-hazardous waste Subtitle D landfill; and

4. Replace excavated material with clean fill in compacted lifts to pre-excavation grade. Provide proper drainage and re-vegetate as necessary.

4.1.3 Alternative 3 – Soil Excavation and On-Site Treatment

Under Alternative 3, petroleum-affected soil will be removed and stockpiled for land farming operations based on field screening for total VOCs augmented by soil-water agitation testing for residual petroleum. The removal action would generally be performed as follows:

1. Remove soil containing separate- and/or residual-phase petroleum and/or soil with PID readings generally exceeding 628 ppm. The final limits of excavation will be based on floor and wall confirmation samples as presented in NYSDEC Draft DER-10 (2002). There is an estimated volume of approximately 2,000 cubic yards or 3,000 tons (see Figure 2.3);

2. Dewatering of soil will not be necessary as the excavations will only proceed to the depth of the water table estimated at 7 feet bgs;

3. Treat excavated soil using fertilizers or an equivalent form of soil treatment along with regularly scheduled "plowing" activities to aerate the stockpiled material;

4. Replace excavated material with clean fill in compacted lifts to pre-excavation grade. Provide proper drainage and re-vegetate as necessary; and

5. Upon completion of land farming activities (estimated at a minimum of two-years), spread stockpiled material over the lay down area and vegetate.

4.2 Evaluation Criteria

Removal action alternatives are evaluated based on the following three criteria to ensure that each alternative developed would be effective in protecting human health and the environment, would be technically and administratively feasible, and cost effective. These evaluation criteria, listed below, are based on Environmental Protection Agency (EPA) guidance (1993).

1. The effectiveness of an alternative;
2. The implementability of an alternative; and
3. The capital cost, indirect capital cost, and annual costs associated with implementing the alternative.

Evaluation based on these three broad criteria helps ensure that all alternatives considered achieve RAOs. Each criterion is discussed below.

4.2.1 Effectiveness

The effectiveness of a removal action alternative is a measure of the ability of that alternative to satisfy the RAOs established for the site. The effectiveness of each alternative for addressing petroleum-affected soil was assessed by evaluating the effectiveness criteria described below.

4.2.1.1 Short-Term Effectiveness

The short-term effectiveness criterion addresses the effects of the alternative during implementation before the RAOs have been met. Specific factors addressed within this criterion include protection of workers, the community, and the environment during implementation of the removal action, and the time until RAOs are achieved.

4.2.1.2 Long-Term Effectiveness

Long-term effectiveness provides an evaluation of the ability of the alternative to reduce exposure to site impacts. Finally, long-term effectiveness of the removal action addresses the alternative's continued ability to comply with RAOs.

4.2.2 Implementablity

The implementability of a removal action is assessed by evaluating the technical and administrative feasibility of implementing the removal action.

4.2.2.1 Technical Feasibility

Technical feasibility evaluates the degree to which a removal action can be constructed and reliably operated and maintained following construction. Technical feasibility also evaluates the availability of personnel, services, and materials to implement a removal action; the availability of required treatment, storage, and disposal services; and the capacity of available services.

4.2.2.2 Administrative Feasibility

Administrative feasibility evaluates those activities needed to coordinate with state and local agencies. The administrative feasibility of each alternative includes the need for off-site permits, adherence to applicable non-environmental laws, and concerns of other regulatory agencies.

4.2.3 Cost

The financial cost for implementing each removal action alternative is estimated to allow cost comparisons between the alternatives. Capital costs, such as engineering design, and equipment are included. Operation and maintenance costs are also included, when applicable. Costs developed for each alternative were based on a combination of vendor quotations and actual bid prices for similar projects.

4.3 Evaluation of Alternatives

This section describes and evaluates three removal action alternatives, including the "No Action" alternative as required by applicable guidance from the EPA and the NYSDEC, for the source removal action at Site 15. Each alternative has been developed to address the RAOs and to achieve the overall goal of protecting human health and the environment. In addition, time to completion will be evaluated as mission-critical construction is planned for the site in 2009.

4.3.1 Alternative 1 - No Action

The evaluation of Alternative 1 is provided below.

4.3.1.1 Effectiveness

Because concentrations of benzene, ethylbenzene, and total xylenes in the Site 15 source area currently exceed their respective SCOs for protection of groundwater as presented in NYSDEC Table 375-6.8(b), continued leaching of petroleum residuals will continue to represent an ongoing risk to site groundwater. Alternative 1 would not meet the short-term or long term effectiveness to comply with RAOs.

4.3.1.2 Implementability

Alternative 1 is implementable as there are no technical or administrative obstacles associated with no removal action.

4.3.1.3 Cost

As no actions would be taken, no financial costs are associated with Alternative 1.

4.3.2 Alternative 2 - Soil Excavation and Off-Site Disposal

The evaluation of Alternative 2 is provided below.

4.3.2.1 Effectiveness

Alternative 2 would provide for the removal of the majority of petroleum-affected soil from the source area at Site 15. Therefore, this alternative meets the short-term and long term effectiveness in addressing the alternative's ability to comply with RAOs.

4.3.2.2 Implementability

Standard and readily available construction equipment would be adequate to implement Alternative 2; therefore, this alternative is technically feasible. Administratively, this alternative will not require permits or other administrative compliance tasks.

4.3.2.3 Cost

Table 4-1 provides a breakdown of costs associated with Alternative 2 based on the removal and off-site disposal of approximately 2,000 cubic yards of petroleum-affected soil. The estimated cost to implement this alternative is $505,433.

4.3.3 Alternative 3 – Soil Excavation and On-Site Treatment

The evaluation of Alternative 3 is provided below.

4.3.3.1 Effectiveness

The effectiveness of Alternative 3 would be similar to that of Alternative 2 by providing on-site treatment of the petroleum-affected soil from the Site 15 source area. This alternative meets the short-term and long term effectiveness in terms of complying with RAOs.

4.3.3.2 Implementability

Standard and readily-available construction equipment would be adequate to implement Alternative 3; therefore, this alternative is technically feasible. Administratively, this alternative should not require permits or other administrative compliance tasks.

4.3.3.3 Cost

Table 4-2 provides a breakdown of costs associated with Alternative 3 based on the removal and on-site treatment of approximately 2,000 cubic yards of petroleum-affected soil. The estimated cost to implement this alternative is $570,269.

Section 5

SECTION 5.0

COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The following sections provide a comparative analysis of the effectiveness, implementability, and cost of each removal action alternative developed for the Site 15 Source area remedial effort. Table 5-1 summarizes the comparative analysis for each of the three alternatives.

5.1 Effectiveness

Alternative 1 would not meet the short-term or long term effectiveness to comply with RAOs. Concentrations of benzene, ethylbenzene, and total xylenes in the Site 15 source area currently exceed their respective SCOs for protection of groundwater. Leaching of these petroleum products will continue and will represent an ongoing risk to groundwater quality. Alternative 2 would provide for the removal of the majority of petroleum-affected soil from the source area at Site 15 and is effective for the short-term and long-term in addressing the RAOs. The effectiveness of Alternative 3 would be similar to that of Alternative 2 by providing on-site treatment of the petroleum-affected soil from the Site 15 source area. This alternative meets the short-term and long term effectiveness in terms of complying with RAOs.

5.2 Implementability

Alternative 1 is implementable as there are no technical or administrative obstacles associated with no action. Standard construction equipment would be adequate to implement Alternative 2; therefore, this alternative is technically feasible. Administratively, this alternative will not require permits or other administrative compliance tasks. Standard construction equipment would be adequate to implement Alternative 3; therefore, this alternative is technically feasible. Administratively, this alternative also will not require permits or other compliance tasks.

5.3 Cost

There are no costs associated with Alternative 1 as no removal action would be implemented. The net present value costs to implement removal actions 2 and 3 are as follows:

- Alternative 2 (Soil Excavation and Off-Site Disposal) = $505,433
- Alternative 3 (Soil Excavation and On-Site Treatment) = $570,269

5.4 Additional Criteria

Discussions with ANG personnel indicate that mission-critical consturction is planned for the Site 15 area in 2009. Based upon this information, ERM has also evaluated the three alternatives based on the required time to achieve RAOs.

There are no time restrictions associated in Alternative 1 as no removal action would be implemented. Alternative 2 (Soil Excavation and Off-Site Disposal) can be implemented in a three to four week time frame with an estimated completion date of September 2008.

Alternative 3 (Soil Excavation and On-Site Treatment) would initially take three to four weeks to construct the on-site stockpiles. Based on the soil volume and concentrations of VOCs within the soil, approximately two years of operations and maintenance, including adding fertilizers and tilling, will be required to complete the removal action. This results in an estimated completion date of September 2010.

Section 6

Section 6

SECTION 6.0

RECOMMENDED REMOVAL ACTION

Alternative 2 (Soil Excavation and Off-Site Disposal) is the recommended removal action alternative. This alternative provides the most reliable short and long-term effectiveness and provides effective protection of human health and environment. This alternative is both technically and administratively implementable and requires no long-term maintenance or monitoring. Alternative 2 is also more cost effective than the other removal action evaluated. Additionally, Alternative 2 is the only removal action contemplated that will be completed prior to planned mission-critical building construction at Site 15.

Section 7

Section 7

SECTION 7.0

PUBLIC COMMENT

The *Draft Final EE/CA* report was made available to the public during a 30-day public comment period of 1 June through 30 June 2008. An advertisement was placed in the Syracuse Post Standard in the Sunday, 1 June 2008 edition describing the EE/CA process and points of contact. The comment period included a community relations meeting held at the Mattydale Library in Mattydale, New York on 26 June 2008 to present the findings of the EE/CA document and to provide a forum for public comment. No written or verbal comments were received during the 30-day public comment period or at the community relations meeting.

Section 8

Section 8

SECTION 8.0

REFERENCES

Air National Guard (ANG). 2005. *Environmental Restoration Program Investigation Guidance.*

EPA. 1993. *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA,* Office of Solid Waste and Emergency Response. EPA/540/P-93/057.

Environmental Resource Management (ERM), 2008. *Site 15 Interim Remedial Action - Supplemental Remedial Investigation Technical Memorandum - Revised,* 174th Fighter Wing - New York Air National Guard- Hancock Air National Guard Base - Syracuse, New York - ERM, Dewitt, New York, May 2008

ERM, 2007. *Site 15 Interim Remedial Action - Remedial Investigation Technical Memorandum,* 174th Fighter Wing - New York Air National Guard- Hancock Air National Guard Base - Syracuse, New York - ERM, Dewitt, New York, January 2007

Lockheed, 1997. *Final Remedial Investigation Report for Petroleum, Oil, and Lubricant Facility, Site 15.* Volumes I and II. Prepared by Lockheed Martin for the Air National Guard Readiness Center, Andrews AFB, Maryland. July 1997.

New York State Department of Environmental Conservation (NYSDEC), 1992. *Petroleum-Contaminated Soil Guidance Policy.* NYSDEC Spill Technology and Remediation Series Memorandum Number One, Division of Construction Management, Bureau of Spill Prevention and Response, August 1992.

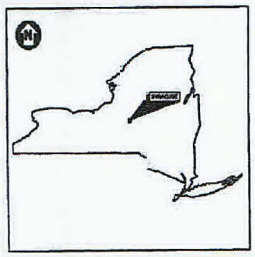
NYSDEC, 2006. Part 375: General Remedial Program Requirements, Environmental Conservation Law (ECL) Article 1, Section 0101; ECL Article 27, Titles 13 and 14; ECL Article 52, Title 3; ECL Article 56, Title 5; ECL Article 71, Title 36; Chapter 577, Laws of 2004 and State Finance Law Article 6, Section 97-B; Effective December 14, 2006.

Parsons, 2004. *Remedial Action Plan for Hancock ANG Site 15.* Parsons Engineering Science, Inc., Liverpool, New York, January 2004.

Figures

FIGURES

N



THE STATE OF NEW YORK
(NOT TO SCALE)

Legend

Supplemental Remedial Investigation Work Area

Air National Guard Base Property Outline (Note: property boundary extends outside figure extent)

SITE LOCATION

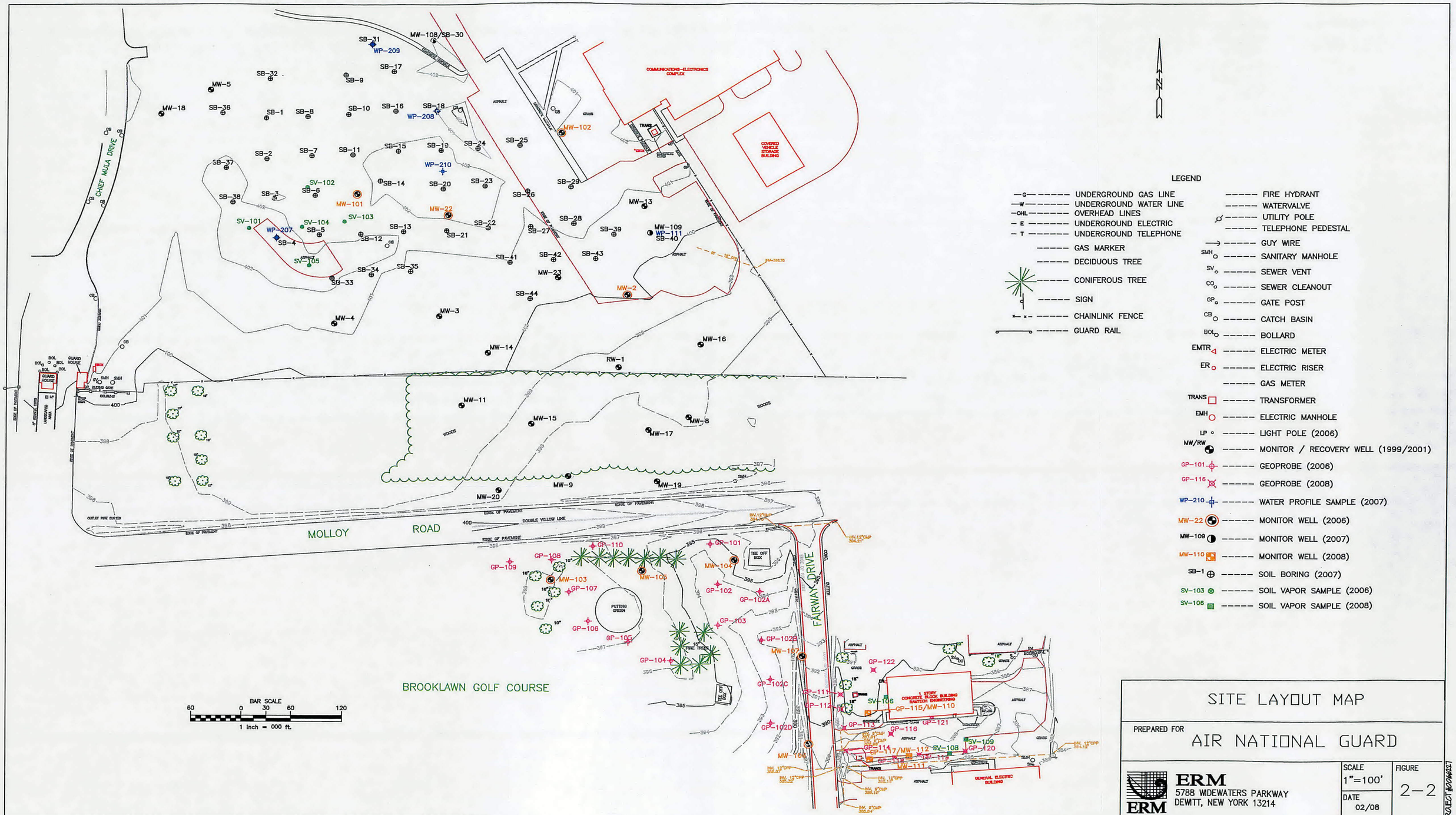
PREPARED FOR
AIR NATIONAL GUARD

ERM
5788 WIDEWATERS PARKWAY
DEWITT, NEW YORK 13214

SCALE	FIGURE
ON MAP	2-1
DATE	
03/08	

PROJECT #0066227

R:\Flanath Drawings\Name Date



N

LEGEND

- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- OVERHEAD LINES
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- GAS MARKER
- DECIDUOUS TREE
- CONIFEROUS TREE
- SIGN
- CHAINLINK FENCE
- GUARD RAIL
- FIRE HYDRANT
- WATERVALVE
- UTILITY POLE
- TELEPHONE PEDESTAL
- GUY WIRE
- SANITARY MANHOLE
- SEWER VENT
- SEWER CLEANOUT
- GATE POST
- CATCH BASIN
- BOLLARD
- ELECTRIC METER
- ELECTRIC RISER
- GAS METER
- TRANSFORMER
- ELECTRIC MANHOLE
- LIGHT POLE (2006)
- MONITOR / RECOVERY WELL (1999/2001)
- GEOPROBE (2006)
- GEOPROBE (2008)
- WATER PROFILE SAMPLE (2007)
- MONITOR WELL (2006)
- MONITOR WELL (2007)
- MONITOR WELL (2008)
- SOIL BORING (2007)
- SOIL VAPOR SAMPLE (2006)
- SOIL VAPOR SAMPLE (2008)

SITE LAYOUT MAP

PREPARED FOR

AIR NATIONAL GUARD

ERM
5788 WIDEWATERS PARKWAY
DEWITT, NEW YORK 13214

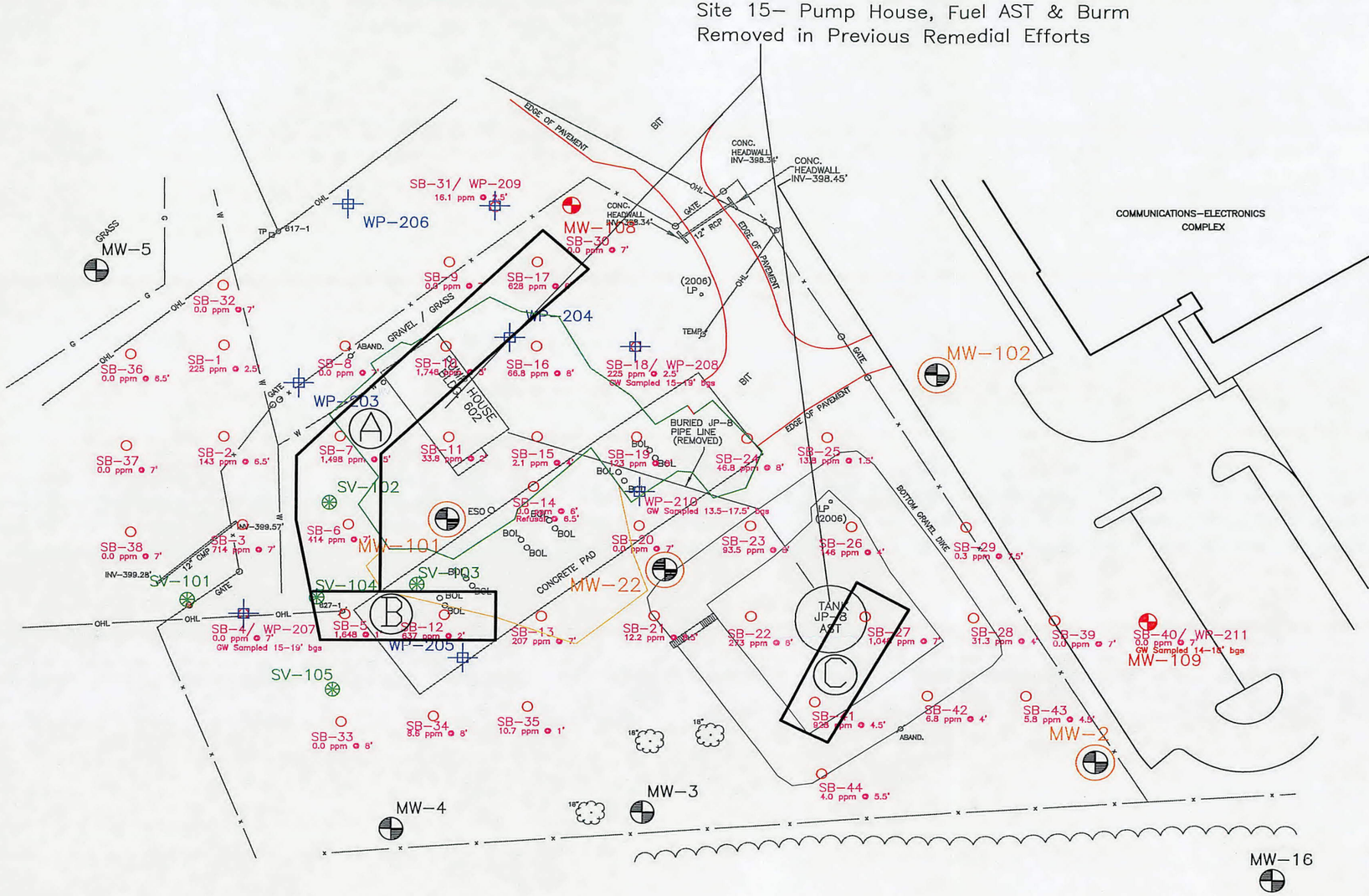
SCALE 1"=100'

DATE 02/08

FIGURE 2-2

PROJECT #0046827

Site 15– Pump House, Fuel AST & Burm Removed in Previous Remedial Efforts



LEGEND

- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- OVERHEAD LINES
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- GAS MARKER
- DECIDUOUS TREE
- CONIFEROUS TREE
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- CHAINLINK FENCE
- FIRE HYDRANT
- WATERVALVE
- UTILITY POLE
- TELEPHONE PEDESTAL
- GUY WIRE
- SANITARY MANHOLE
- CATCH BASIN
- BOLLARD
- LIGHT POLE (2006)
- MONITORING / RECOVERY WELL (1999/2001)
- WP–202C WATER PROFILE SAMPLE LOCATION (2006)
- DP–101 DIRECT PUSH SAMPLE LOCATION (2006)
- SV–103 SOIL VAPOR SAMPLE LOCATION (2006)
- MW–22 MONITORING WELL LOCATION (2006)
- MW–108 MONITORING WELL LOCATION (2007)
- SB–29 0.3 PPM BORING LOCATION WITH HIGHEST OBTAINED PPID READING IN PARTS PER MILLION (PPM) (2007)
- SOIL VAPOR SAMPLE LOCATION (2007)
- EXTENT OF BTEX EXCAVATION (PARSONS JUNE 2003) AVERAGE DEPTH OF SOIL EXCAVATION 9.5–FEET
- EXTENT OF SHALLOW PCB EXCAVATION (PARSONS JUNE 2003) AVERAGE DEPTH OF SOIL EXCAVATION 2–FEET
- PROPOSED SOURCE AREA SOIL REMOVAL
- (A) DESIGNATION FOR SOIL REMOVAL QUANTITY ESTIMATE

SCALE (FEET)

0 30 60 120 200

SITE 15 PROPOSED SOURCE AREA SOIL REMOVAL

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5788 WIDEWATERS PARKWAY
DEWITT, NEW YORK 13214

SCALE: AS SHOWN
DATE: 02/08
FIGURE: 2–3

PROJECT #0044021

Tables

TABLES

Table 4-1

Estimated Costs for Removal Action Alternative 2
Soil Excavation and Off-Site Disposal
174th Fighter Wing, New York Air National Guard
Hancock ANG Base
Syracuse, New York

Category	Total Cost
Direct Capital Costs	
Source Excavation and Off-Site Disposal	$354,244
Associated Laboratory Testing	$8,255
Direct Capital Costs	**$362,499**
Indirect Capital Costs	
Engineering Design	$65,667
Professional Services (Survey)	$3,649
Engineering, Procurement, and Construction Oversight	$73,618
Indirect Capital Costs	**$142,934**
Annual Costs - Not Applicable	$0
Annual Costs	**$0**
Total Costs for Removal Action Alternative 2	**$505,433**

Table 4-2

Estimated Costs for Removal Action Alternative 3
Soil Excavation and On-Site Treatment
174th Fighter Wing, New York Air National Guard
Hancock ANG Base
Syracuse, New York

Category	Total Cost
Direct Capital Costs	
Soil Excavation and On-Site Treatment (Construction)	$350,678
Associated Laboratory Testing	$23,250
Direct Capital Costs	**$373,928**
Indirect Capital Costs	
Engineering Design	$81,290
Professional Services (Survey)	$7,725
Engineering, Procurement, and Construction Oversight	$85,176
Indirect Capital Costs	**$174,191**
Annual Costs - Operations and Maintenance (O&M)	
Annual Costs	$11,075
Assumed Two Years thru 2010	**$22,150**
Total Costs for Removal Action Alternative 2	**$570,269**

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Table 5-1

Comparative Analysis of Removal Action Alternatives
174th Fighter Wing, New York Air Nation Guard
Hancock ANG Base
Syracuse, New York

Alternative	Effectiveness	Implementability	Additional Criteria - Time Frame	Cost
Alternative 1 - No Action	Alternative 1 would not meet the short-term and long term effectiveness to comply with RAOs as BTEX in the unsaturated soil currently exceeds regulatory criteria.	Alternative 1 is implementable as there are no technical and administrative obstacles associated with no removal action.	Alternative 1 is acceptable as there are no time critical obstacles associated with no removal action.	$0
Alternative 2 - Soil Excavation and Off-Site Disposal	Alternative 2 is effective for the short-term and long-term in addressing the RAOs.	Alternative 2 is implementable as standard construction equipment is adequate to implement the removal action and off-site disposal.	Alternative 2 is acceptable as there are no time critical obstacles associated with source area soil removal and off-site disposal.	$505,433
Alternative 3 - Soil Excavation and On-Site Treatment	Alternative 3 is effective for the short-term and long-term in the long-term in addressing the RAOs.	Alternative 3 is implementable as standard construction equipment is adequate to implement the removal action and on-site land farming.	Alternative 3 is unacceptable as there are time critical obstacles (Mission critical construction is planned for the area in 2009). - Estimated completion of Soil excavation and On-Site Treatment is the end of 2010.	$570,269