Final Proposed Plan for Environmental Cleanup

New York Air National Guard 174TH Fighter Wing
Hancock Air National Guard Base
Syracuse, New York
Site 15

26 July 2010

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ERM

National Guard Bureau
Proposed Plan

Environmental Restoration Program
Site 15

The National Guard Bureau invites the public to comment on the Proposed Plan to clean up Site 15 at the New York Air National Guard 174th Fighter Wing located at the Hancock Air National Guard Base in Syracuse, New York.

The site is referred to as Environmental Restoration Program (ERP) Site 15, located within the New York Air National Guard (ANG) 174th Fighter Wing (FW) at Hancock ANG Base (Base). The Site was listed as a Class 2 site on the New York State Inactive Hazardous Waste Disposal Site Registry in 1994 as Site Number 734054. 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 originally consisted of brush and wooded vegetation, a large concrete pad, and a bermed area where a 215,000-gallon aboveground tank was formerly located. Site 15 has sustained spills of mainly jet propulsion (JP)-4 and JP-8 military aviation fuels and poly-chlorinated bi-phenols (PCBs) over the years.

This Proposed Plan (PP) identifies the preferred alternatives for cleaning up the environmental impacts to groundwater at ERP Site 15. This site is hereafter referred to as Site 15 in the remainder of this document. This PP is being issued by ANG in accordance with the public participation requirements in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The PP requirement is described in Section 300.430(f)(2) of Title 40 (Environment) within the Code of Federal Regulations (CFR). This PP was completed under contract DAHA92-01-D-0005, Delivery Order 0119, between ERM-West, Inc. (ERM) and the National Guard Bureau.

Want to know more?

Following are several ways to obtain additional information:

The reference material cited in this document is available for review at the

INFORMATION REPOSITORY:

Salina Free Library
100 Belmont Street
Mattydale, New York 13211
Telephone: (315) 454-4524
Monday-Thursday
10:00 a.m. to 8:00 p.m.
Friday
10:00 a.m. to 5:00 p.m.
Saturday
10:00 a.m. to 4:00 p.m.

The complete Administrative Record is available for review by contacting:

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The ANG has worked very closely with the New York State Department of Environmental Conservation (NYSDEC) to identify and test cleanup technologies for environmentally impacted soil and groundwater at Site 15. The community will have the opportunity to comment on this PP and comments will be addressed in the Record of Decision (ROD). The ANG will review comments submitted during this 30-day public comment period, and will consult with the NYSDEC to determine whether to modify the preferred alternatives presented in this PP. The remainder of this PP describes:

- Site conditions and types of contamination present at each site;
- Current and future risks to human health and the environment;
- The preferred alternative for Site 15;
- How to participate in the selection or modification of the preferred alternatives; and
- Where to get more information.

Site Background

The current mission of the 174th FW is to provide combat ready personnel, aircraft, and equipment prepared for worldwide deployment; to deter, or attack and destroy enemy surface and airborne forces in support of joint operations, and to support civil authorities at the direction of the Governor. The current vision of the 174th FW is to:

- Safely fly, fix, and support the F-16 mission;
- Prepare, deploy, support, and reintegrate Air Expeditionary Force personnel; and
- Stand-up the MQ-9 Field Training Detachment and the first MQ-9 Combat Air Patrol.

Site 15 is located at the 174th FW, which is based at Hancock Field, an active international airport and a former Air Force Base (AFB) located 2 miles north-northeast of the City of Syracuse in Onondaga County in central New York (Figure 1). The ANG facility is currently operating within the southern portion of the former Hancock AFB located south of the municipal airport.

Environmental studies performed from 1990 to 2009 identified Site 15 as having potential to cause environmental impact and a site that warranted further assessment. Site 15 and down-gradient off-site areas were subsequently identified as having soil and groundwater impacted with chemicals from petroleum products. Cleanup of the soil materials causing the contamination has taken place over the last decade in order to prevent further environmental impacts. The current focus is to clean up contamination in the groundwater at Site 15 and related off-site areas. Site 15 and the related off-site areas that are the subject of this PP as also shown on Figure 1.

Site 15 is approximately 2.5-acres in area and consists of brush and wooded vegetation, a large concrete pad, and a former bermed area where a 215,000-gallon aboveground tank was located. Site 15 was formerly used as a pump house for the Petroleum, Oil, and Lubricants area and sustained spills of mainly JP-4 and JP-8 military aviation fuels and PCBs over the years of operation. A removal action was completed at Site 15 by the ANG in accordance with an approved Work Plan for the *Time Critical Removal Action at Site 15 at Hancock Field* (Parsons, October 2001). The objective of the removal action was to reduce the risk to potential receptors by excavation and removal of the PCB-impacted soil from Site 15. Supplemental objectives included removing the closed underground tanks and soil directly adjacent to the tanks, conducting additional investigation of groundwater conditions at and down-gradient of Site 15, and providing selected monitoring well rehabilitation and abandonment.

Field work consisted of excavation and offsite disposal of 2,880 tons of PCB-impacted soil and 5,360 tons of BTEX-impacted soil, removal and offsite disposal of steel tanks and associated piping, monitoring well rehabilitation, abandonment of one monitoring well within the excavation area, and additional groundwater investigation work. A report is available that documents the methods and findings of the removal action (Parsons, 2003).

ERM developed and performed an Engineering Evaluation/ Cost Analysis for the 174th FW of the New York ANG, located at the Hancock ANG Base in DeWitt, New York. This Engineering Evaluation/Cost Analysis was performed in support of a planned interim remedial action (IRA) at ERP Site 15 as a result of remedial investigation activities conducted in 2006. Elevated photoionization detector 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.

Excavation, transportation, and disposal of petroleum-affected soil were completed by ERM and their remediation contractor in August 2008. Petroleum-affected soils were transported to the Ontario County Landfill for use as a non-hazardous daily cover at their Stanley, New York facility. A total of 84 truck loads of petroleum-affected soil (approximately 2,890-tons) were removed from the site. Approximately 4,800 pounds of the chemical equivalent of PermeOx® Plus, an Oxygen Releasing Material, were applied within the bottom of the excavation areas.

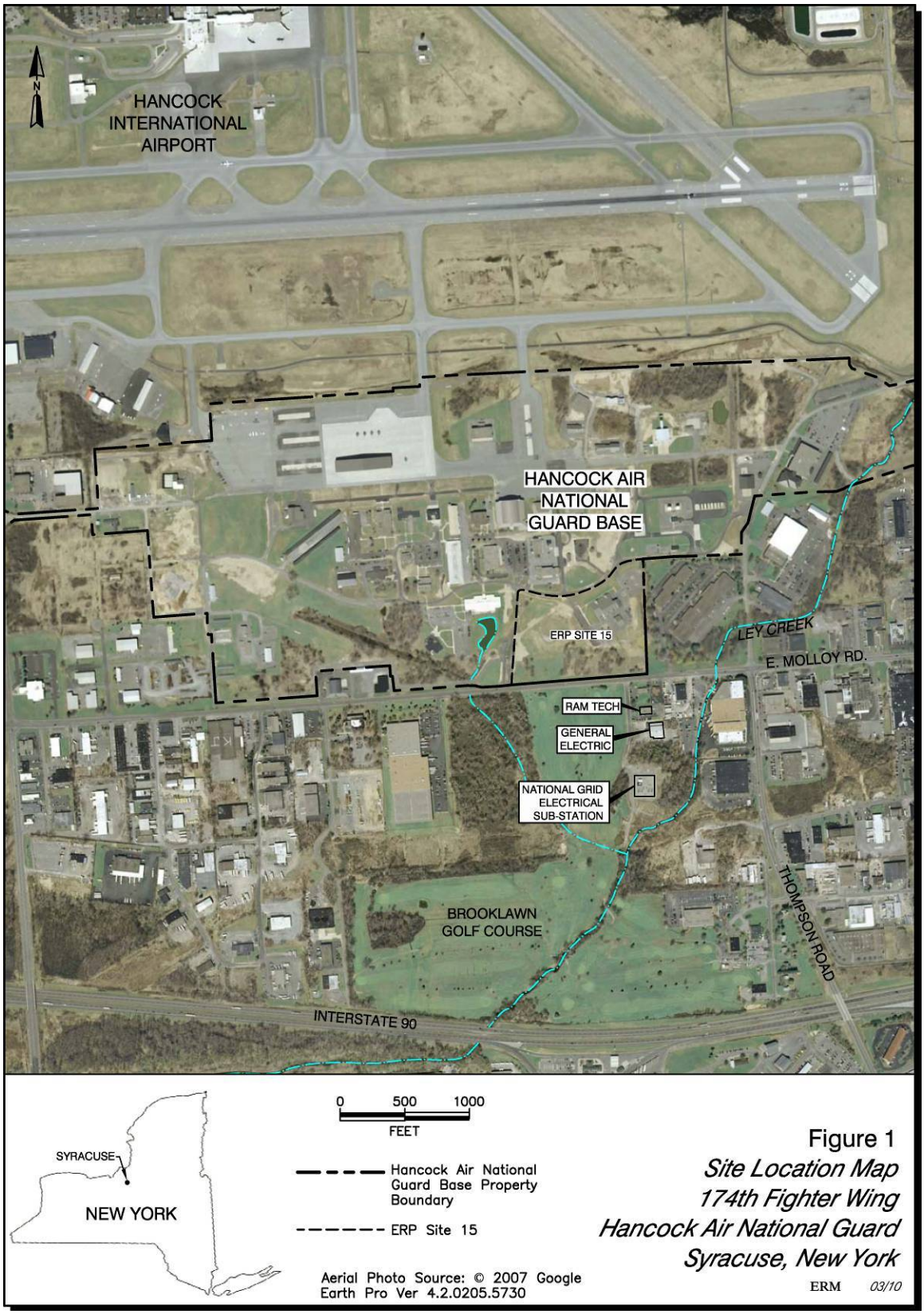


Figure 1
Site Location Map
174th Fighter Wing
Hancock Air National Guard
Syracuse, New York
ERM 03/10

Site Characteristics

This section briefly summarizes the environmental impacts that have been identified at Site 15. Additional details on recent investigations can be obtained from the reference documents available at the Information Repository at the Salina Free Library, and the administrative record is available at the base (See information box on Page 1).

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).

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).

The Site 15 *Final Technical Memorandum – Supplemental Remedial Investigation/Pilot Test (PT) Report* (ERM 2010a) indicated that benzene, ethylbenzene, and total xylenes (BEX) were detected in groundwater samples at this site. Groundwater monitoring identified the BEX compounds exceeding NYSDEC Class GA ambient groundwater quality standards. The results of the environmental investigations conducted at Site 15 and the off-site locations indicated the following:

- Groundwater flows in a south to south easterly direction as shown on Figure 2;
- Depth to groundwater is approximately 2.0- to 10.5-feet below ground surface; and
- In groundwater, both on Site 15 and off-site on Brooklawn and Ram Tech Property, the contaminants of concern (COCs) are BEX.

These results suggested that a cleanup, technically referred to as a remedial action (RA), is necessary to address BEX-impacted groundwater at Site 15.

Successful field scale testing of a BEX cleanup technology was conducted in April 2009, consisting of an in situ chemical oxidation (ISCO) PT via injection of calcium peroxide in 20 locations. The injection of the calcium peroxide provided an additional energy source (i.e., food) for the natural microorganisms so that their populations can grow and metabolize the BEX compounds in groundwater. The results of this pilot study are the basis for selecting Source Removal and Focused Enhanced Aerobic Bioremediation with Monitored Natural Attenuation (MNA) as the RA for Site 15 groundwater (ERM 2010a).

On Figure 3, the areas where groundwater is contaminated at levels above the NYSDEC Class GA Ambient Groundwater Quality Standards are outlined in yellow. These are the areas where the selected RA will be applied at Site 15.

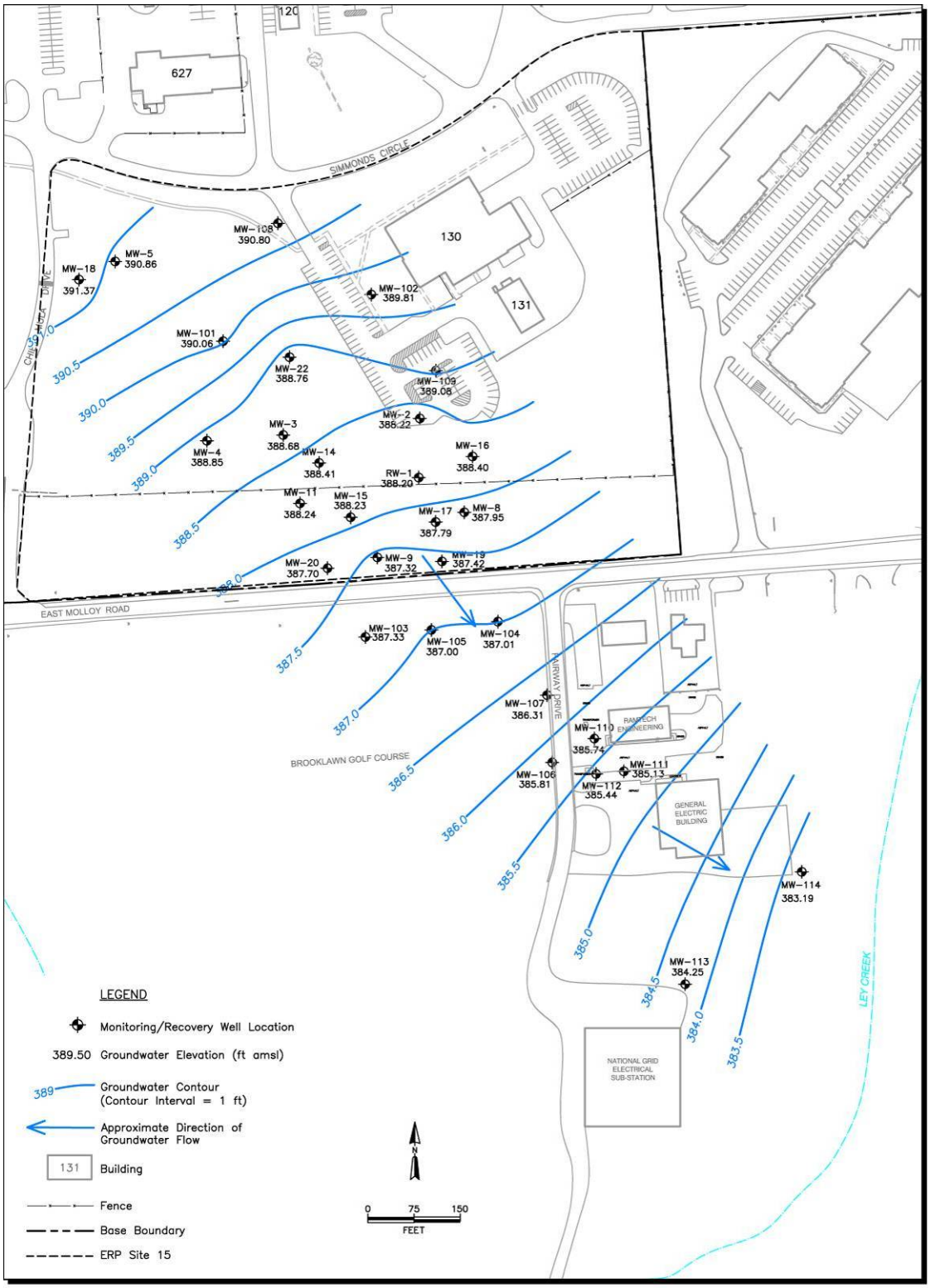


Figure 2
Static Groundwater Contour Map
6 October 2009
174th Fighter Wing
Hancock Air National Guard
Syracuse, New York
ERM 03/10

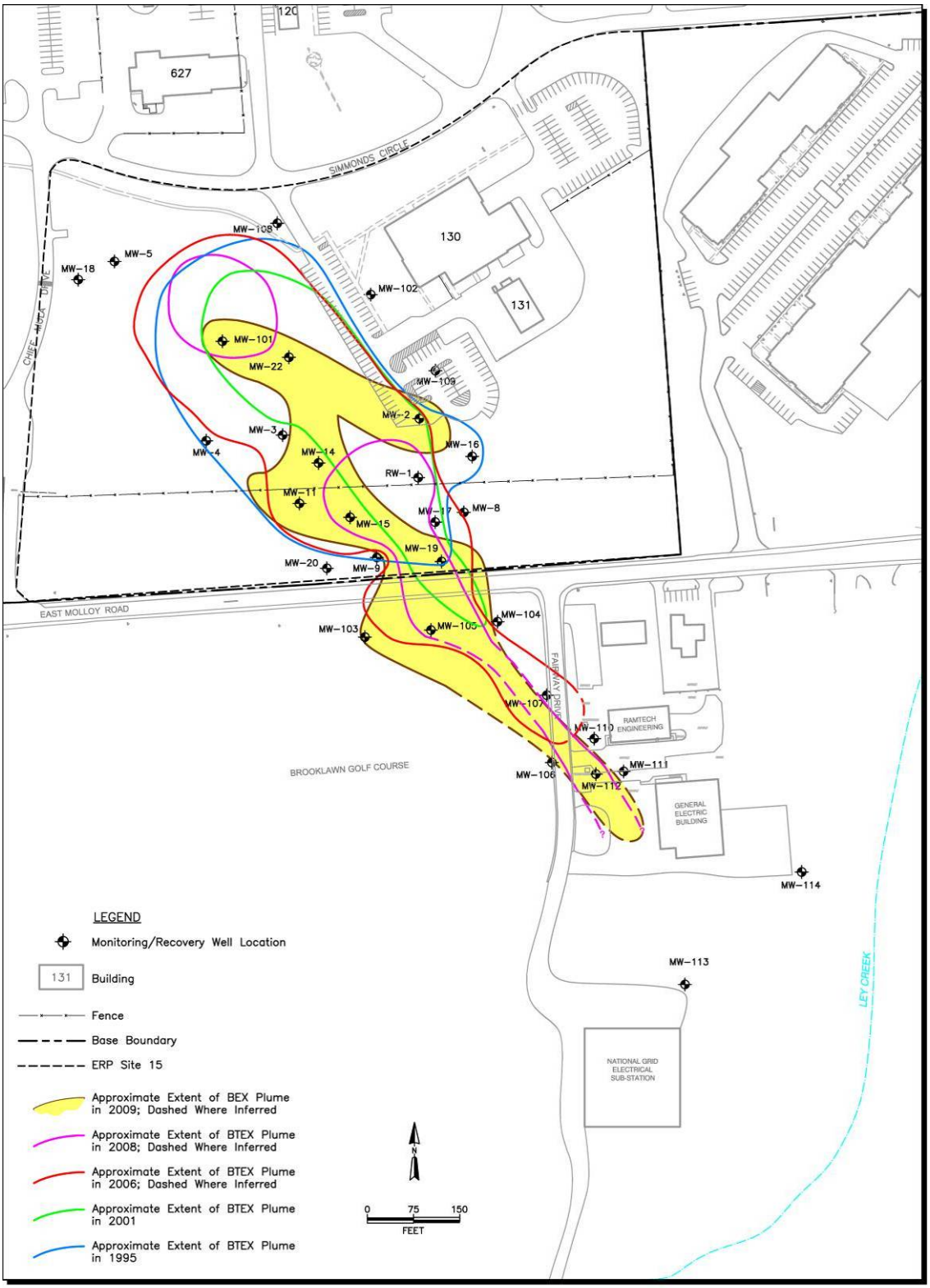
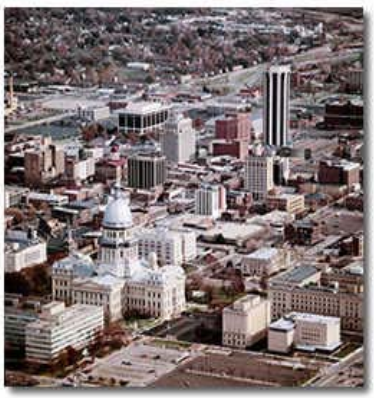


Figure 3
Estimated BTEX Extent
1995 to 2009
174th Fighter Wing
Hancock Air National Guard
Syracuse, New York
ERM 03/10

Scope and Role



The primary objective of the RA at Site 15 is to reduce potential risks to human health and the environment from COC-impacted soil and/or groundwater. Soil at Site 15 was addressed by the IRA in August 2008 (ERM 2009). Therefore, cleanup of the impacted groundwater at Site 15 will be addressed to reduce COC concentrations in groundwater to below the applicable or relevant and appropriate requirements (ARARs). The NYSDEC Remedial goals are derived in Title 6, New York Code of Rules and Regulations [6NYCRR] Part 375. Media that are candidates for remedial evaluation are identified based on the nature and extent of contamination and ARARs standards, criteria, and guidance (SCGs). As identified in 6 NYCRR 375-1.10(c)(1)(ii), SCGs are provided in NYSDEC guidance. The most recent NYSDEC guidance containing SCGs is draft DER-10 (NYSDEC 2002).

The ANG is working closely with the NYSDEC to implement this cleanup in accordance with all applicable federal and state environmental laws, thereby ensuring that the public is protected and kept fully informed throughout the cleanup process.

This PP summarizes the logic used to develop RAs for cleaning up COC-impacted groundwater at Site 15. Information used to prepare the PP is part of the Administrative Record and is available for public review at the local Public Information Repository (see the Introduction section, page 1).

Summary of Site Risks

As part of the Focused Feasibility Study (FFS), the ANG evaluated the potential risk to persons who would be living or working at or near the impacted site. Additional information on the risk to human health and the environment is presented in the *Final FFS* (ERM 2010b).

Cleanup of BEX-contaminated soil, consisting of removal of thousands of cubic yards of material, has already been performed at Site 15. As contaminated soil has previously been removed, the main focus of the risk evaluation was exposure by ingestion of groundwater (i.e., by drinking COC-impacted well water). Exposure by inhalation and skin contact are not considered to be realistic exposure scenarios for Site 15 groundwater. Site worker exposure to impacted groundwater through ingestion is unlikely, due to the absence of groundwater supply wells and the availability of municipal water at the site. Exposure to groundwater for people living or working off the Base is also unlikely because impacts are limited to a very small area within the site boundaries.

Site-specific quantitative baseline risk assessments were not conducted for Site 15 groundwater; therefore, the basis for implementing RAs at these sites is the exceedance of SCGs. SCGs represent the concentrations of COCs in groundwater that can be safely consumed daily for a lifetime. Therefore, they are conservative, generic, and risk-based groundwater remediation standards.

Migration pathways define the route and method by which a chemical moves from the source to a location where people could potentially be exposed. The soil at these sites is slightly clayey fine to medium sand, which results in relatively slow groundwater flow that limits contaminant migration across the base and off-site. Groundwater testing indicates that contaminants have migrated beyond the site boundary in a very narrow band; thus, the potential for public exposure is very low.

Table 1 below summarizes the COCs in groundwater for Site 15.

Table 1 – Contaminants of Concern in Groundwater at Site 15

Contaminant	Highest Level Detected (mg/L)	Groundwater Quality Standards* (mg/L)
Benzene	0.049	0.001
Ethylbenzene	0.380	0.005
Xylenes	0.420	0.005

Notes:
Highest Level Detected Data is from the October 2009 Sampling Event described in the 2010 Final Technical Memorandum on 2009 Supplemental Remedial Investigation.
mg/L – milligrams per liter
* *NYSDEC Division of Water Technical and Operational Guidance Series Memorandum Number 1.1.1* (TOGS 1.1.1; NYSDEC 1998).Class GA.

Site 15 – Effect on Ecology

The area encompassed by Site 15 is primarily covered by grasses, weeds, bushes, and asphalt or concrete pavement, with no significant natural vegetation or wildlife other than small birds, and small mammals. Therefore, the impacts at Site 15 are not anticipated to have an effect on the ecology.

It is the lead agency's current judgment that the Preferred Alternative identified in the PP, or one of the other active measures considered in the PP, is necessary to protect public health or welfare or the environment from actual or threatened released of hazardous substances into the environment.

Remedial Action Objectives

Remedial Action Objectives (RAOs) are site-specific goals that define the scope and extent of cleanup. The RAOs were formulated to achieve ANG and NYSDEC goals for protection of human health and the environment by restoring the impacted groundwater to levels that are safe for current and future uses.

RAOs must comply with the ANG policy to perform RAs in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), complete remediation while occupying the property, and avoid post-lease remedial activity. Additionally, the ANG requires that RAs not interfere with their ability to carry out the Base mission, which has potential for direct consequences to Homeland Security.

Site 15 – Groundwater

Based on the evaluation discussed in the *Final FFS* (ERM 2010b) and the draft NYSDEC guidance regarding development of RAOs in DER-10 (NYSDEC 2002), the RAOs for Site 15 groundwater are:

- GWRAO1 - Prevent human exposure to contaminated groundwater containing BEX concentrations above the NYSDEC Ambient Water Quality Standards and Guidance;
- GWRAO2 - Prevent or minimize further off-site migration of the contaminant plume (plume containment);
- GWRAO3 - Prevent or minimize further migration of contaminants from source materials to groundwater (source control);
- GWRAO4 - Enhance the natural process for the attenuation of BEX compounds on-site and off-site; and
- GWRAO5 - Prevent inhalation of or exposure from chemicals of potential concern volatilizing from groundwater that poses a risk to public health and the environment given the intended use of the Site.

Achieving these RAOs through the application of the selected RAs will allow unrestricted future use of Site 15.

Development & Selection of Remediation Technologies

Based on the information provided above, the ANG and NYSDEC believe that the RAs at Site 15 identified

in this PP are necessary to protect human health and the environment. The following sections summarize the RA method selection process, as well as the logic used to select the cleanup technologies for contaminated groundwater at Site 15.

RA Development

As part of the RA development process, a small-scale field test of potential RAs referred to as a PT was conducted at Site 15. Prior to the PT, all of the COCs identified at Site 15 were proven to biologically degrade during laboratory tests. In the PT conducted on Site 15 groundwater, the use of calcium peroxide generally resulted in the decrease in concentrations of the BEX compounds. The results of the PT demonstrated that calcium peroxide is an effective method for removing COCs in groundwater at this site. Significant reduction in COC concentration was evident within a 6-month time frame. A more detailed description of the PT results is provided in *the Final Technical Memorandum Supplemental Investigation/PT* (ERM 2010a) and the *Final FFS* (ERM 2010b).

RA Screening

The RAs selected for this site are, to the extent practicable, in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and the NCP.

The CERCLA requirements for RAs are:

- Be protective of human health and the environment;
- Attain RAOs;
- Be cost-effective; and
- Utilize permanent solution and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element.

In order to meet the statutory requirements listed above, eight of nine evaluation criteria stipulated in the NCP have been used for evaluation of the potential alternatives. The submittal of this PP and the review, analysis, and incorporation of public comments into this document, represent the evaluation of the ninth NCP criteria (Community Acceptance). Descriptions of these criteria are provided below.

Overall Protection of Human Health and the Environment

This evaluation criterion provides a final check to assess whether each alternative provides adequate protection of human health and the environment. The overall assessment of protection considers the assessments conducted under other evaluation criteria, particularly long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. This evaluation also allows for consideration of whether an alternative poses any unacceptable short-term or cross-media impacts.

Compliance with ARARs

This evaluation criterion is used to determine whether each alternative will meet all of their identified federal and state ARARs.

Long-Term Effectiveness and Permanence

The evaluation of a remedial alternative relative to its long-term effectiveness and permanence is made considering the risks remaining at the site after the remedial goals have been met.

Reduction of Toxicity, Mobility, or Volume

This evaluation criterion addresses the degree to which the remediation alternatives permanently and significantly reduce the toxicity, mobility, or volume of the COC(s).

Short-Term Effectiveness

The short-term effectiveness of a remedial alternative is evaluated relative to its effect on human health and the environment during implementation of the alternative.

Implementability

The remedial alternatives must be evaluated to estimate the degree to which each can satisfy implementability criteria. Implementability refers to the technical, administrative, and environmental feasibility of implementing an alternative, and the availability of various materials and services required for implementation.

Cost

Detailed cost estimates were developed for each remedial alternative and compared in order to establish the cost effectiveness of each alternative.

State Acceptance
This assessment evaluates any concerns the state may have regarding implementation of the selected alternative. This criterion will be further addressed in the ROD, once regulatory comments on this PP have been received.

Community Acceptance
This assessment evaluates any concerns the community may have regarding implementation of the selected alternative. This criterion will be addressed by a thorough evaluation of the comments received during the public presentation and comment period. Public concerns and comments on this PP will be documented in the ROD, including any public responses and changes made to this PP.

Previous public meetings associated with the soil removal interim remedial measure (IRM) were held in July 2008 and no responses were received from the public at that time.

Remedial Action Selection

Site 15 – Groundwater

The alternatives evaluated as potential RAs at Site 15 as groundwater remedies are:

- Alternative 1: No Further Action.
- Alternative 2: Source Removal and MNA.
- Alternative 3: Source Removal and Focused Enhanced Aerobic Bioremediation with MNA.
- Alternative 4: Source Removal and Expanded Enhanced Aerobic Bioremediation with MNA.

Alternative 1 – No Further Action. The No Further Action alternative assumes that no active treatment measures, site modifications, groundwater monitoring, or other actions would be undertaken to prevent or eliminate human health and environmental risks associated with impacted media. Please note: As previously discussed, IRMs were performed in 2001, 2008 and 2009.

This alternative does not meet the effectiveness criterion, as it includes no measures to protect human health and the environment, comply with RAOs, or reduce contaminant, toxicity, mobility or volume (TMV), except through unmonitored natural attenuation processes. The only protection to human health would be the mandatory enforcement of Part 5 of the New York State Department of Health (NYSDOH) State Sanitary Code, which prevents installation of a private potable water supply well in areas that are served by a public water supply system. This would prevent potable water consumption of affected Site groundwater. However, the No Further Action alternative is a required component of the United States Environmental Protection Agency Feasibility Study process and thus is retained as a baseline for comparison against the other alternatives.

Alternative 2 – Alternative 2 utilizes excavation and off-site disposal of the source areas and MNA as the primary treatment methods. Based on the observed BEX concentrations, the duration of this alternative is expected to range from up to 30 years.

Implementation of Alternative 2 at the Site would involve:

- Use restrictions: Part 5 of the NYSDOH State Sanitary Code, which prevents installation of a private potable water supply well in areas that are served by a public water supply system, would continue to be enforced. This would prevent future use of the BEX affected groundwater as drinking water;
- Implementation of Common Action No. 1: Indoor Air investigation at the Ramtech Property;
- Implementation of the excavation IRA: Excavation and disposal of the identified source area. This portion of Alternative 2 has already been completed as an IRA;
- Implementation of the enhanced bioremediation PT IRA: Completion of the 2009 PT in the areas where BEX compounds were above NYSDEC Standards. This portion of Alternative 2 has already been completed as an IRA;
- Monitoring BEX concentrations and natural attenuation parameters in shallow groundwater quarterly for 5 years and annually for up to 30 years; and
- Monitoring of volatile organic compounds (VOCs) would be performed to verify that concentrations are decreasing with time. A decreasing trend in VOC concentrations throughout the area of contamination would indicate that the TMV of the COCs are decreasing and that VOC plume is not continuing to expand. Monitoring of natural attenuation parameters would be conducted to verify that VOCs are

biodegrading and to estimate the rate of intrinsic bioremediation.

This alternative meets the criteria of implementability and cost, but does not meet the criteria for effectiveness, since the rate at which attenuation is occurring has been insufficient to contain the plume on site and decrease concentrations across the plume. Therefore, this alternative is not retained for further evaluation.

Alternative 3 – In Alternative 3, the primary treatment utilizes excavation and off-site disposal of the source areas, aerobic bioremediation to prevent further off-site migration and MNA as the primary treatment methods.

Implementation of Alternative 3 at the site would involve:

- Use restrictions: Part 5 of the NYSDOH State Sanitary Code, which prevents installation of a private potable water supply well in areas that are served by a public water supply system, would continue to be enforced. This would prevent future use of the BEX affected groundwater as drinking water;
- Implementation of Common Action No. 1: Indoor Air investigation at the Ramtech Property;
- Implementation of the two IRAs:
  - Excavation and disposal of the identified source area. This portion of Alternative 3 has already been completed as an IRA; and
  - Enhanced Bioremediation Pilot Study already completed and used to evaluate effectiveness of enhanced bioremediation, spacing of the injection points and peroxide loading.
- Installation of aerobic biological treatment barriers primarily along Molloy Road and Fairway Drive to control off-site migration of VOCs; approximately 43 injection points would be installed using direct-push techniques with a maximum of 50 pounds of solid peroxide injected at each injection location; the barriers would consist of rows of direct-push injection points, with 20 feet spacing as determined during the PT;
- Monitoring BEX concentrations and natural attenuation parameters in shallow groundwater conducted quarterly for 4 years and annually for up to 10 years; and
- Since solid peroxide generally persists for 1 to 3 years after injection, additional injections of solid peroxide will be required at Year 2 at 50% of the original injection locations with a maximum of 50 pounds of solid peroxide injected at each injection location; the number of injection points will be fewer than the first injection event, since the attenuation of the plume is expected to accelerate due to the flux reduction resulting from the source area removal action and the initial peroxide injections. For cost estimation purposes it has been assumed that follow-up injections in approximately 50% of the 43 original locations (i.e., 22 locations) will be required at Year 2.

This alternative meets the criteria of effectiveness, implementability, and cost, and is, therefore, retained for further evaluation.

Alternative 4 – In Alternative 4, the primary treatment utilizes excavation and off-site disposal of the source areas, aerobic bioremediation of the plume site wide using solid peroxide and MNA as the primary treatment methods. Implementation of Alternative 4 at the site would involve:

- Use restrictions: Part 5 of the NYSDOH State Sanitary Code, which prevents installation of a private potable water supply well in areas that are served by a public water supply system, would continue to be enforced. This would prevent future use of the BEX affected groundwater as drinking water;
- Implementation of Common Action No. 1: Indoor Air investigation at the Ramtech Property;
- Implementation of the two IRAs:
  - Excavation and disposal of the identified source area. This portion of Alternative 4 has already been completed as an IRA; and
  - Enhanced Bioremediation Pilot Study already completed and used to evaluate effectiveness of enhanced bioremediation, spacing of the injection points and peroxide loading.
- Injection of a slurry of solid peroxide into rows of direct push points located within both on-site and accessible off-site areas of the plume that are currently above RAOs. The released oxygen will enhance aerobic biodegradation and as concentrations of VOCs decrease over time, the treatment area will be reduced.

Assuming an inter-well spacing within rows of 20 feet and 12 rows of points (7 on-site and 5 off-site), approximately 106 injection points will be required to address areas of the plume after excavation;

- Monitoring VOC concentrations and natural attenuation parameters in shallow groundwater quarterly for 3 years during active remediation and annually for up to 10 years;
- Since solid peroxide generally persists for 1 to 3 years after injection, additional injections of solid peroxide will be required at Year 2 at 53 of the original injection locations with a maximum of 50 pounds of solid peroxide injected at each injection location; the number of injection points will be fewer than the first injection event, since the attenuation of the plume is expected to accelerate due to the flux reduction resulting from the source area removal action and the initial peroxide injections. For cost estimation purposes it has been assumed that follow-up injections in approximately 50% of the 106 original locations (i.e. 50 locations) will be required at Year 2; and
- This alternative meets the criteria of effectiveness, implementability, and cost, and is, therefore, retained for further evaluation.

The evaluation of the four RA alternatives for Site 15 groundwater, based on the NCP criteria is summarized in Table 2.

Table 2 – Summary of Comparative Analysis Site 15 Groundwater

NCP Evaluation Criteria	Site 15 Groundwater			
	A1	A2	A3	A4
Overall Protection of Human Health and the Environment	***	**	*	*
Compliance with ARARs	***	**	*	*
Long-Term Effectiveness and Permanence	***	**	*	*
Reduction of Mobility, Toxicity, or Volume	***	**	*	*
Short-Term Effectiveness	***	**	**	**
Implementability	*	*	*	*
Cost	*	*	**	***
State Acceptance	***	**	*	*

Notes: Relative performance of remedy
* = alternative effectively satisfies criterion
** = alternative moderately satisfies criterion
*** = alternative poorly satisfies criterion
Alternative 1 (A1) – No Further Action
Alternative 2 (A2) – Source Removal and MNA
Alternative 3 (A3) – Source Removal and Focused Enhanced Aerobic Bioremediation with MNA
Alternative 4 (A4) - Source Removal and Expanded Enhanced Aerobic Bioremediation with MNA

The following is a summary of the comparative analysis for Site 15 groundwater. **Note: Alternative 1 does not meet the RAOs but has been included for comparison purposes only. Alternative 2 was not screened for further evaluation as it would not meet the groundwater RAOs.**

<u>Overall Protection of Human Health and the Environment</u>
All of the alternatives are equally protective in the near and long term since groundwater at the Site and in the vicinity of the Site is not currently used for drinking water or any other potable purposes based on the results of the well search. Therefore, the most protective alternative would be that which most reliably, completely, and quickly removes BEX from groundwater.

Alternative 1 (No Further Action) is not expected to reliably or quickly remove VOCs from site and off-site groundwater.

Alternatives 3 and 4 are expected to reliably and quickly reduce VOC concentrations in groundwater (through solid peroxide bioremediation) and impacted soil (through previous excavation). Solid peroxide bioremediation technologies have been used successfully in similar applications and both alternatives offer protection of human health and the environment.

Alternative 3 involves application of active treatment targeting the migration pathway mainly in the off-site plume area, and relies on institutional controls and natural attenuation processes for the protection of human health and the environment in the on-site impacted groundwater.

Alternative 4 has been designed to actively treat all BEX-impacted areas on and off-site. As there are currently no exposures to either on-site or off-site groundwater, Alternatives 3 and 4 are equally protective of human health and the environment.

Compliance with ARARs

Alternative 1 is not expected to reduce the chemical-specific SCGs (ARARs are complied with by meeting SCGs) for the impacted groundwater within a reasonable timeframe.

Both Alternatives 3 and 4 are expected to reduce chemical concentrations to below the chemical-specific SCGs for the impacted groundwater and soil within a reasonable timeframe.

Alternative 3 focuses its treatment on the off-site plume migration pathway with some on-site treatment. Reduction of further on-site and off-site and the Site's VOC concentrations are expected to be achieved within 2 to 4 years of implementation.

Alternative 4 actively treats on- and off-site groundwater and reduction of further off-site migration is expected to be achieved within 1 to 2 years and reduction of the site-wide VOC concentrations is expected to be achieved within 2 years of implementation.

Long-Term Effectiveness and Permanence

Alternative 1 does not provide long-term effectiveness, since no measures are taken to reduce or monitor concentrations of VOCs in groundwater or to remove soil impacts.

Alternatives 3 and 4 both provide long-term protectiveness, since both alternatives will permanently reduce VOCs concentrations and achieve RAOs through excavation, solid peroxide bioremediation and natural attenuation. However, Alternative 4 is expected to provide the most reliable long-term effectiveness as in situ bioremediation is applied the most aggressively throughout the whole impacted plume.

Reduction of Toxicity, Mobility, or Volume

Alternative 1 will not significantly reduce the TMV impacted groundwater at the Site within a reasonable timeframe. Some reduction of toxicity may occur through natural attenuation; however, this alternative does not include measures to monitor this reduction, or to ensure that the mobility and/or volume of contaminated groundwater does not increase.

Alternatives 3 and 4 are expected to effectively reduce the TMV of contaminated groundwater at the Site through direct oxidation and natural attenuation.
Alternative 4 is expected to be more effective than Alternative 3 in reducing contaminant TMV, due to the expanded provisions for biodegradation.

Short-Term Effectiveness

Alternative 1 would not create new short-term concerns, as No Further Actions are being conducted. The potential health risks to workers in the form of exposure to the solid peroxide in Alternatives 3 and 4 can be controlled through the use of appropriate health and safety measures.

Implementability

Alternative 1 is the easiest alternative to implement, as it requires No Further Action.

Both Alternatives 3 and 4 primarily involve the direct-push injection of an oxidizer; however, Alternative 3 would be slightly easier to implement as it requires fewer injection points than Alternative 4.

Cost

Detailed cost estimates were developed in the *Final FFS* (ERM 2010b) for each remedial alternative and compared in order to establish the cost effectiveness of each alternative. The detailed cost estimates included: (1) Capital costs, including both direct and indirect costs; (2) Annual operation and maintenance costs; and (3) Net present value of capital and operation and maintenance costs. A Summary of these costs for Alternatives 1, 3 and 4 is presented below:

Table 3 – Alternative Cost Estimate

No.	Remedial Action Alternative	Total Incurred Capital Costs	Total Capital Costs to be Incurred	Total O&M NPV Cost	Total NPV Cost
		A	B	C	B + C
1	No Further Action	$0	$0	$0	$0
3	Source Removal + Focused Enhanced Aerobic Bioremediation + MNA	$607,000	$165,985	$507,244	$673,229
4	Source Removal + Extended Enhanced Aerobic Bioremediation + MNA	$607,000	$421,164	$512,349	$933,514

Alternative 1 is the least expensive alternative; however, this alternative does not satisfy the effectiveness criterion because it is not expected to achieve the site RAOs within a reasonable timeframe. This alternative is therefore not cost reasonable.

Alternatives 3 and 4 achieve the site RAOs within a reasonable timeframe. However, Alternative 4 costs are approximately $260,285 higher than Alternative 3 due to higher capital costs derived from the larger number of injection points required.

Alternative 3 would require a slightly more extensive monitoring program. Alternative 3 requires more years of quarterly monitoring (4 years) compared to Alternative 4's quarterly monitoring requirements (3 years) as the on-site plume will not be as aggressively treated in Alternative 3 and VOC reduction is expected to be achieved between 2 to 4 years; therefore, for cost estimation purposes, it has been assumed that 4 years of quarterly monitoring will be needed for Alternative 3.

Due to the expanded provisions for biodegradation, Alternative 4 is expected to reduce VOC concentrations within the first 2 years of implementation; therefore, for cost estimation purposes, it has been assumed that only 3 years of quarterly monitoring will be required.

Preferred Remedial Action

This section presents the selected RA alternatives for Site 15 based on overall protectiveness of human health and the environment, as well as adequately satisfying NCP evaluation criteria. The ANG believes that the RAs selected are the best options in order to achieve all RAOs, based on the site-specific conditions.

Site 15 – Groundwater

Based on information currently available, the ANG believes the Preferred Alternative meets the threshold criteria and provides the best balance of trade-offs among the other alternatives with respect to the balancing and modifying criteria. The NYSDEC does concur that the chosen remedy, Alternative 3, satisfies most of the RAOs, but questions the efficacy and cost effectiveness of additional peroxide injections. The NYSDEC believes that the already completed IRAs- source area contaminated soil removal and Enhanced Bioremediation Pilot Study - have eliminated any further threat of groundwater contamination and satisfy the RAOs, and that additional peroxide injections are not cost effective.

While the ANG believes the NYSDEC comments are valid (regarding MNA vs. injections), in the abundance of caution and to expedite the remedial process, the ANG recommends Alternative 3 because it satisfies the remedy-selection evaluation criteria and addresses the impacted groundwater and soil at the Site in the most cost-effective way. Alternative 3 involves the direct-push injection of solid peroxide in targeted migration pathway areas mostly located within the off-site plume, excavation of the identified source areas; institutional controls and MNA (see Figure 4). The solid peroxide solution in the migration pathways is expected to prevent further off-site migration by completely and permanently destroying dissolved VOCs and enhancing natural bioremediation. Impacted on-site groundwater would eventually be treated off-site, and source removal and natural attenuation processes would reduce on-site VOC levels within a reasonable timeframe. Alternative 3 is expected to achieve site RAOs within a relatively short time (i.e., 2 to 4 years).

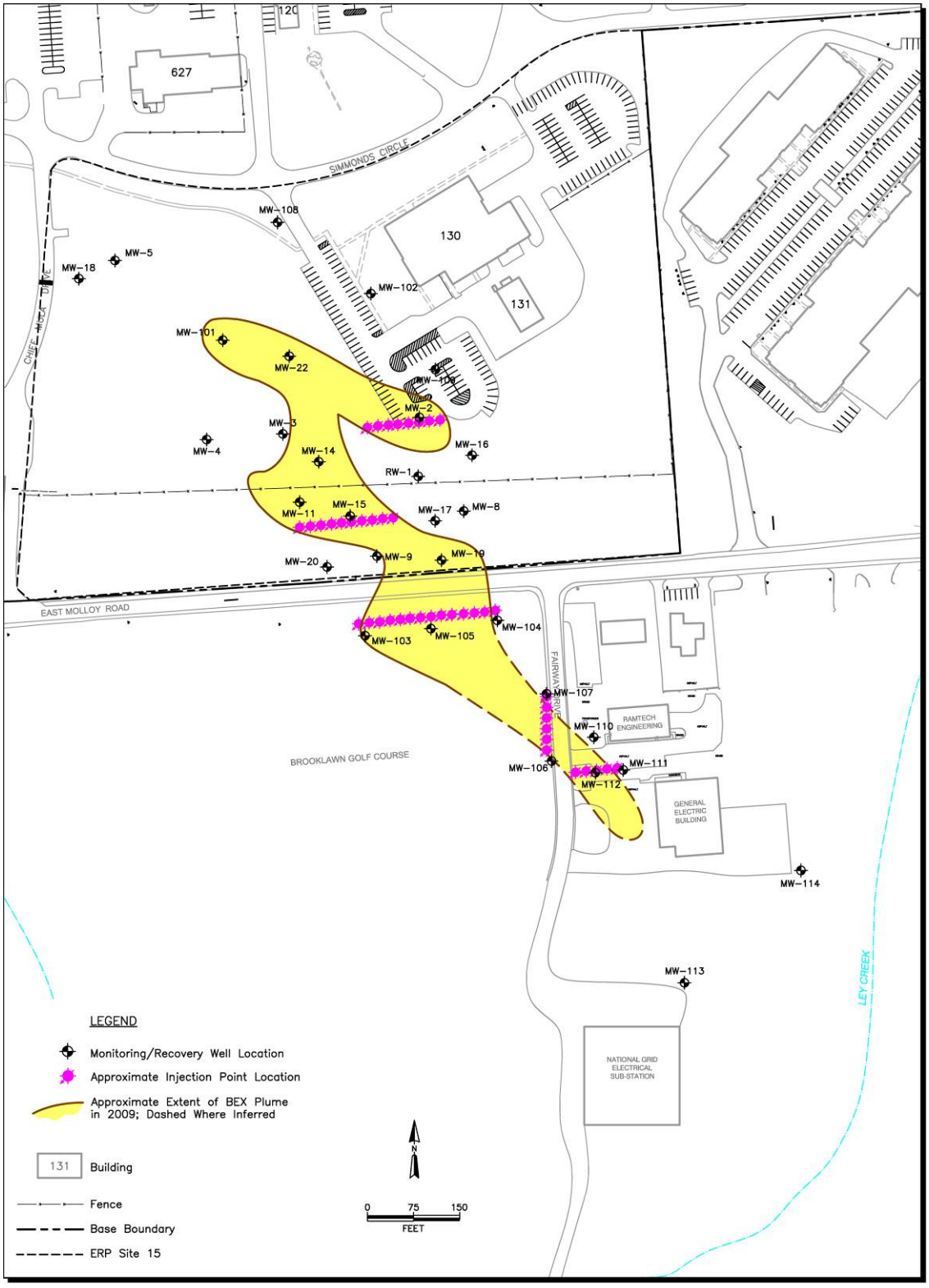


Figure 4
Alternative 3: Focused Enhanced ISCO Bioremediation
Proposed Conceptual Design Slurry Injection Locations
174th Fighter Wing
Hancock Air National Guard
Syracuse, New York
ERM 03/10

Community Participation

ANG encourages the public to review this document and other relevant documents in the Administrative Record to gain an understanding of Site 15 and the proposed cleanup actions. A copy of this PP, as well as pertinent documents, is located in the Information Repository at the Salina Free Library located at 100 Belmont Street in Mattydale, New York. The telephone number is (315) 454-4524.

Salina Free Library hours of operation:

Monday through Thursday	10:00 a.m. to 8:00 p.m.
Friday	10:00 a.m. to 5:00 p.m.
Saturday	10:00 a.m. to 4:00 p.m.

The ANG has tentatively scheduled a public meeting at the Salina Free Library for 9 September 2010 at 6:00 p.m. to discuss cleanup alternatives and to address questions and concerns the public may have about these RAs.

A 30-day public comment period, which allows the public time to review the documents and submit comments on the preferred and other alternatives, will take place following publication of the Final PP. All comments must be postmarked by the date listed in a public notice, which will be published in a local newspaper. Public input regarding the PP for Site 15 is important to the ANG. Comments provided by the public are valuable in helping the ANG and NYSDEC develop and implement RAs that are protective of human health and the environment. The ANG will document, evaluate, and respond to comments as part of the ROD for this site.

Want to give us your comments?

Make your opinions heard.

Please Contact:

Air National Guard Environmental Restoration Branch
Ms. Jody Murata
Program Manager
3500 Fetchet Avenue
Andrews AFB, MD 20762-5157
Telephone: (301) 836-8120
E-Mail: Jody.Murata@ang.af.mil

References

The following documents* can be reviewed in the Information Repository at the Salina Free Library located at 100 Belmont Street in Mattydale, New York.

ERM. 2009*. *Site 15 Final Construction Completion Report - Source Area Soil Removal*, 174th Fighter Wing - New York Air National Guard- Hancock Air National Guard Base – Syracuse, New York – ERM, Dewitt, New York, January 2009.

ERM. 2010a*. *Final Technical Memorandum – Supplemental Remedial Investigation/Pilot Test* - 174th Fighter Wing - New York Air National Guard- Hancock Air National Guard Base – Syracuse, New York, March 2010.

ERM. 2010b*. *Final Focused Feasibility Study* - 174th Fighter Wing - New York Air National Guard- Hancock Air National Guard Base – Syracuse, New York, March 2010.

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.

NYSDEC. 2002. DER-10, *Draft Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation, December 2002.

Parsons. 2001. Work Plan for the *Time Critical Removal Action at Site 15 at Hancock Field,* Prepared for the Air National Guard Readiness Center, Andrews AFB, Maryland, October 2002.

Parsons. 2003. Construction Completion Report for the *Time Critical Removal Action at Site 15 at Hancock Field* Prepared for the Air National Guard Readiness Center, Andrews AFB, Maryland.

Glossary

Administrative Record File: A compendium of all documents relied upon to select an alternative for a remedial action.

Air National Guard (ANG): A civilian reserve component of the United States Air Force that provides prompt mobilization during war and assistance during national emergencies.

Applicable or Relevant and Appropriate Requirements (ARARs): These are Federal or state environmental rules, regulations, or contaminant limits/standards.

Benzene, ethylbenzene, and total xylenes (BEX): The compounds present at Site 15 that are above NYSDEC Standards

Bioremediation: Bioremediation refers to treatment processes that use microorganisms such as bacteria, yeast, or fungi to break down hazardous substances into less toxic or nontoxic substances.

Code of Federal Regulations (CFR): The regulations published in the Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal regulation. Most Federal environmental regulations are found in Title 40 of the CFR.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The federal law that addresses problems resulting from releases of hazardous substances to the environment, primarily at inactive sites.

Contaminants: Chemicals present in the environment that do not occur there naturally.

Contaminants of Concern (COCs): Chemicals present in the environment that do not occur there naturally.

Contaminant plume: A localized zone of contaminated groundwater that generally moves in the direction of (and with) groundwater flow.

Focused Feasibility Study (FFS): The lead agency undertakes a focused feasibility study to develop and evaluate options for remedial action.

Groundwater: Water that occurs underground in the pores in soil or openings in rock. Groundwater is often extracted from municipal or domestic wells to be used for drinking water.

Information Repository: Reference material cited in this document is available for review at the Salina Free Library, 100 Belmont Street, Mattydale, New York. Telephone – (315) 454-4524.

In situ: In the context of groundwater treatment, in situ means remaining in the subsurface for treatment as opposed to extraction to the surface for treatment (i.e., ex situ).

In situ chemical oxidation (ISCO): A treatment method That injects chemicals into the groundwater to destroy the contaminants.

Interim Remedial Measure (IRM): A remedial operation performed prior to acceptance of a PP and ROD to limit the potential expansion of the COCs.

Monitored Natural Attenuation (MNA): Natural attenuation relies on natural processes to clean up or attenuate pollution in soil and groundwater. Natural attenuation occurs at most polluted sites. However, the right conditions must exist underground to clean sites appropriately. If not, cleanup will not be quick enough or complete enough. Scientists monitor these conditions to make sure natural attenuation is working.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The Federal Government's plan for the response to oil spills and hazardous substance releases. The NCP has the force of Federal regulation.

New York State Department of Environmental Conservation (NYSDEC): The state agency responsible for most environmental issues in New York. The NYSDEC monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations.

Pilot Test: (PT): The testing of a cleanup technology under actual site conditions to identify potential problems prior to full-scale implementation.

Poly-chlorinated bi-phenols (PCBs): Aromatic compounds containing two benzene nuclei with two or more substituent chlorine atoms. Because of their persistence, toxicity and ecological damage via water pollution their manufacture was discontinued in the US in 1976.

Proposed Plan (PP): A CERCLA document available for public review and comment regarding the plan to clean up a contaminated site. The PP typically provides a brief synopsis of site history, assessment activities, and an analysis of the cleanup options being considered, as well as the planned cleanup approach.

Record of Decision (ROD): A document that records the final cleanup action, approved by the regulatory agencies, that is required at CERCLA and Superfund sites.

Remedial Action (RA): An action used to clean up contaminated sites.

Remedial Action Objectives (RAOs): Narrative statements defining the extent of site cleanup necessary to meet the objective of protecting human health and the environment.

Remediation: The use of remedial methods to reverse or mitigate environmental damage; environmental cleanup.

Risk Assessment: A qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence of contaminants.

Standards, criteria, and guidance (SCGs): These are Federal or state environmental rules, regulations, or contaminant limits/standards.

Toxicity, Mobility and Volume (TMV): Criteria used by the Federal and State Agencies to evaluate chosen remedial alternatives.

Volatile Organic Compound (VOC): Substances containing carbon and different portions of other elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur, or nitrogen. These substances have a strong tendency to evaporate (volatilize) at room temperature. Many VOCs are used as solvents and as additives in fuels.

Place
Stamp
Here

Air National Guard Environmental
Restoration Branch
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Notes / Remarks / Comments:

Please write any notes, comments, remarks, or questions on this form. Fold into thirds, addressed side showing, staple or tape closed, add proper postage and mail. Thank you.