

6/10/03-00397



St. Juliens Creek Annex Summary of Previous Activities and the Proposed Plan for Site 6 (Small Arms Unit)

St. Juliens Creek Public Meeting
June 10, 2003



Purpose

- Present the Public with the background and summary of activities that have occurred at Site 6, the Small Arms Unit
- Present the Public with the draft Proposed Plan for Site 6
- Answer questions and request Public feedback regarding the draft Proposed Plan
- Outline the future steps for Site 6



Location of Site 6



Site 6 Background

- 0.6 acres; located in the northeast corner of the installation near Blows Creek and the Elizabeth River
- Operated from about 1949 through early-1980s as a small munitions disposal area
- The small munitions were burned in an above-ground steel cage (20'L x 8'W x 12'H) underlain by a concrete pad.



Site 6

Location of Site 6



Site 6 Background

- Following operations, remnants of the caged unit were removed and portions were buried in place.
- The area has remained an open field since the end of its operations and no other activities have been reported at the site.



Previous Investigations

- There have been several investigations conducted at Site 6 including:
 - Initial Assessment Study (IAS) conducted in 1981
 - Phase II RCRA Facility Assessment (RFA) conducted in 1989
 - Relative Risk Ranking (RRR) conducted in 1996
 - Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) conducted from 1997 to 2003
 - Engineering Evaluation/ Cost Analysis (EE/CA) conducted in 2002
 - Non-time-critical removal action (NTCRA) conducted in 2002
 - Closeout Report conducted in 2003



Previous Investigations RI/HHRA/ERA

- RI/HHRA/ERA - identified the nature and extent of contamination and risk posed by Site 6
 - Since the size of Site 6 was small, the Site was assessed along with Site 5 (Burning Ground)
 - Site 6 samples included both surface and subsurface soil sampling
 - Compounds in surface soil which indicated potential impacts from Site 6 were the metals barium and zinc
 - The Navy, EPA, and VDEQ agreed that the removal of debris and soil would mitigate all risk associated with Site 6

Environmental Assessment Report for Site 6



Location of Sites 5 & 6



Previous Investigations EE/CA

- EE/CA - Evaluated the acceptable alternatives to eliminate potential risk at Site 6
 - Acceptable alternatives considered:
 - Cover
 - Removal of soils and debris (remnants of the caged unit)
 - Based on the evaluation and cost comparison, it was determined that the alternative most effective in removing potential risk was the complete removal of soils and debris from the site.
 - The EE/CA was available for public review and comment for 30 days (May 1st to 31st, 2002).



Removal Action at Site 6

- The removal action at Site 6 was conducted in September of 2002.
 - 180 cubic yards of debris and soil were removed
 - The removed area was backfilled with clean soil and restored to its original condition
 - Soil confirmation samples and a groundwater sample were collected
- Following the removal action, a Closeout Report was produced which verified that all risk posed from the site had been removed.



Removal Action of Site 6



Proposed Plan for Site 6

- **The Proposed Plan**
 - Identifies the Preferred Alternative for addressing contamination (risk) at Site 6
 - Following the NTCRA
 - Provides the reasoning for selecting this preference



Summary of Current Site Risk

- **Surface Soil:** Because all surface soil has been removed from Site 6, there are no human health risks and no ecological risks to terrestrial receptors associated with surface soil.
- **Subsurface Soil:** Confirmatory sample results were below background concentrations; therefore, Site 6 activities have not impacted subsurface soil.
- **Groundwater:** Groundwater data indicates that historical activities at Site 6 have not impacted groundwater beneath the site.
- **Bottom Line - Site 6 has been removed, therefore, there are no unacceptable human health or ecological risks remaining at the site.**



Remedial Action Objectives

- The site-specific Remedial Action Objective (RAO) for Site 6 is as follows:
 - Prevent or minimize direct contact of human and ecological receptors with remnants of the caged pit.



Summary of Remedial Alternatives

- Typically, there are several remedial alternatives which are considered.
- The remedial alternatives are evaluated based on nine conditions or criteria, including:
 - Objectives to be achieved
 - Quantities to be removed
 - Time to implement
 - Cost
- Since Site 6 and its risks were removed as part of the NTCRA, the only alternative considered was No Further Action (NFA).



Preferred Alternatives

- Based on no unacceptable risk to human health and ecological receptors associated with Site 6, the Preferred Alternative was:
 - **No Further Action (NFA)**
 - Since no waste will be left in place, a five-year review will not be required and no future land use controls/restrictions will be needed at this site.
- The Navy, EPA, and VDEQ support this preferred alternative since it meets the RAO.
- However, final concurrence will only take place after public participation/comments have been received and are addressed.



Current View of Site 6



Community Participation

- A community relations program is being conducted through the Installation Restoration (IR) process.
 - Public input is a key element in the decision making process.
- The public comment period for this Proposed Plan gives the public an opportunity to provide input regarding the source control and risk reduction process for Site 6.
- Public comment is invited and encouraged on the Preferred Alternative for Site 6.



Community Participation

- The Navy and USEPA, in consultation with VDEQ, will make the a final decision on the remedial approach for Site 6 after reviewing and considering all information submitted during the **30-day public comment period**.
- The public comment period will be from June 3 to July 3, 2003.
- Comments must be postmarked no later than July 7, 2003.



Community Participation

During the comment period, interested parties may submit written comments to one of the following addresses:

Ms. Dawn Hayes, Code EV-22DH

Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, VA 23511-2699
Phone - (757) 322-4792
Fax - (757) 322-4805

Mr. Todd Richardson, Code 3HS13

Remedial Project Manager
USEPA Region III
1650 Arch Street
Philadelphia, PA 19103
Phone - (215) 814-5264
Fax - (215) 814-3051

Ms. Debra Miller

Remedial Project Manager
Virginia Dept. of Environmental Quality
629 Main Street, 4th Floor
Richmond, VA 23219
Phone - (804) 698-4206
Fax - (804) 698-4234



Record of Decision

- Following the public comment period, the Navy, in consultation with the EPA and VDEQ, will determine how the Proposed Plan should be modified based on the comments received.
- If the modifications substantially change the proposed remedy, additional public comment may be solicited. If not, then the EPA and Navy will sign a Record of Decision (ROD) for Site 6.



Record of Decision

- The ROD will detail the remedial action chosen for Site 6 (NFA) and will include the Navy's responses to comments received during this public comment period.



Administrative Records

- The Community Relations Plan, Installation Restoration Program fact sheets, and final technical reports concerning Site 6 are available to the public at the following location:

Major Hillard Library

824 Old George Washington Highway, North

Chesapeake, Virginia 23323

(757) 382-3600



This Concludes the Site 6 Proposed Plan Presentation

- **Questions or Comments?**
- **Thank you for coming!**



St. Juliens Creek Annex Groundwater Background Investigation

**St. Juliens Creek RAB
June 10, 2003**



Purpose

- **Discuss importance of establishing background groundwater**
- **Provide a brief description of existing background groundwater data**
- **Present reasons for additional sampling and provide locations of additional wells**
- **Ask for questions/comments**



Background Groundwater

- It is important to establish groundwater concentrations not impacted by IR site activities for St. Juliens Creek Annex to allow comparisons with groundwater associated with an IR site.
- The comparison between background and IR site groundwater will determine if there has been a site release as opposed to naturally occurring and/or anthropogenic concentrations (metals for example).

It is important to ensure that background monitoring well locations are not in any way impacted by potential IR site activities.



Intended Purpose of Background Groundwater Data

- Background groundwater data will be used in Site Screening Assessments and Remedial Investigations (risk assessments).
 - Identify absence/presence of release
 - Identify extent of risk
 - Identify clean-up goals
- The background groundwater investigation will be performed in accordance with EPA guidance.
 - *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, EPA 540-R-01-003, OSWER 9285.7-41, September 2002*
 - Soil Background Investigation was completed in October 2001.



Background Groundwater

- **The Background Groundwater Investigation will focus on the Columbia (shallow) Aquifer.**
- **Site investigations to date have not shown contamination in the Yorktown (deep) Aquifer, therefore, background groundwater for the Yorktown are not needed at this time.**
- **Deep aquifer contamination is not likely, based on the confining unit between the Columbia and Yorktown Aquifers.**



Background Existing Monitoring Well Data Review

In 1999, monitoring wells were installed upgradient of Installation Restoration (IR) sites at SJCA

- 4 wells in shallow groundwater (Columbia Aquifer)
 - 3 wells in deep groundwater (Yorktown Aquifer)
-
- Groundwater samples were collected and analyzed for VOCs, SVOCs, and Metals.

 - All groundwater chemical concentrations were below EPA established Maximum Contaminant Levels (MCLs) in both shallow and deep groundwater.



Background Existing

Monitoring Well Data Review

- Arsenic, iron, and manganese concentrations in shallow groundwater exceeded the EPA established Risk-Based Concentration (RBC) levels for human health; no RBCs were exceeded in the deep groundwater.
- Groundwater background, based on statistics, was not established based on the limited data set (only mean, max., min. established).
 - at least 8 wells are recommended to establish confident statistical information



Existing Background Wells



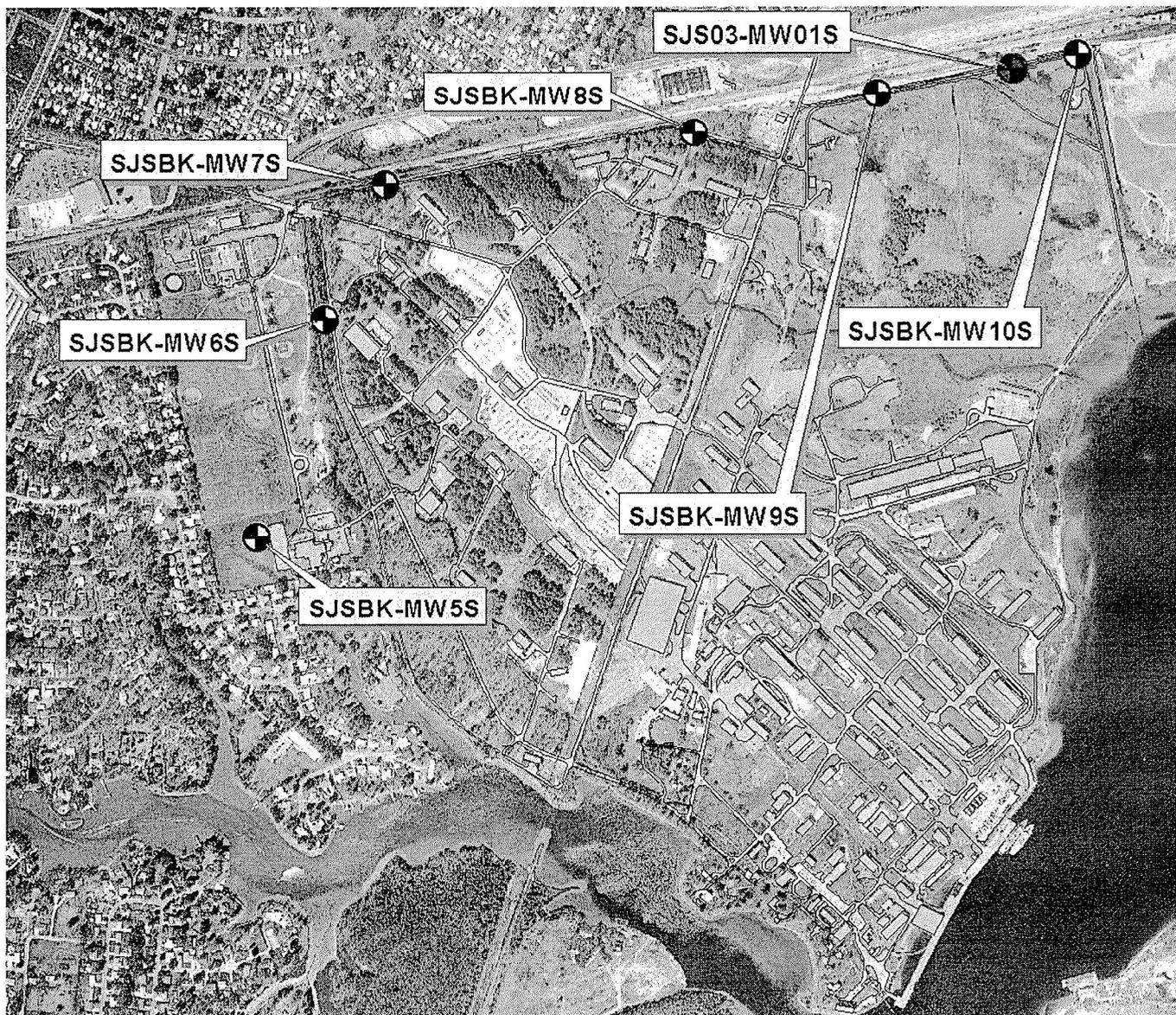


Proposed Additional Samples and Locations

- **Install 6 shallow monitoring wells (-20 feet deep) upgradient of IR sites**
- **Collect one complete round of sampling from the existing (4) and newly installed (6) background wells and the existing upgradient well at Site 3 (SJS03-MW01S) for a total of 11 groundwater samples.**
- **Analyze samples for low concentration VOCs, SVOCs, Pesticides/PCBs, and Metals.**

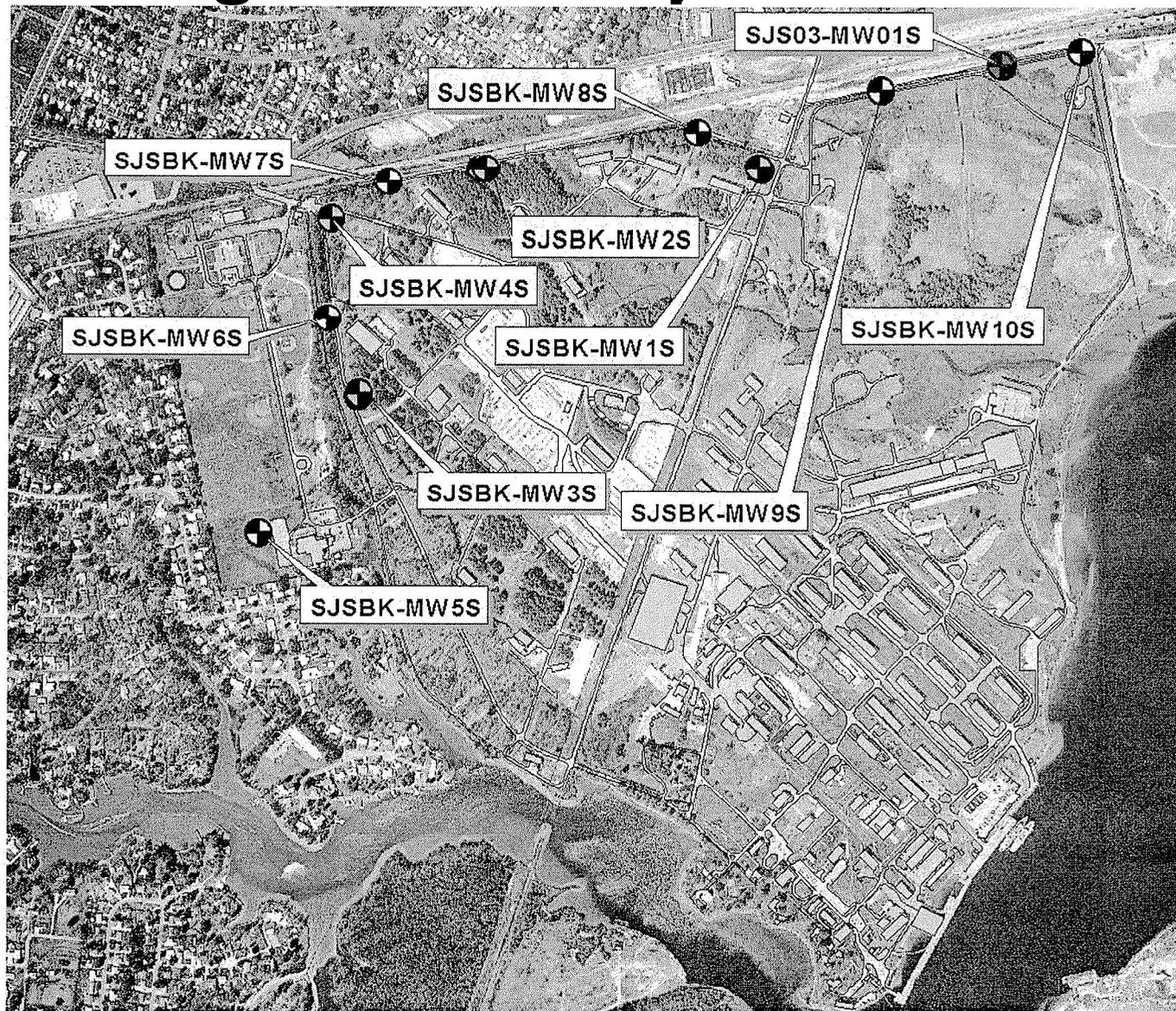


Proposed Additional Sample Locations





Background Sample Locations





Use of Background Groundwater Data

- Performed in accordance with EPA guidance.
 - *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites, EPA 540-R-01-003, OSWER 9285.7-41, September 2002*
- Statistical analysis of shallow groundwater data will be conducted to identify mean, standard deviation, normality, distribution, etc...and establish an Upper Tolerance Limits (UTLs) for each compound.



Use of Background Groundwater Data

- The statistical analysis of background data will be used to better identify and assess site-related contamination and for use in the risk management process
 - Population-to-population comparisons and mean comparisons of site and background data may provide information on localized contamination and the overall extent or absence of contamination at a site
 - For site parameters of potential concern, background data can be used through comparison of site data with the background UTLs and mean
 - Maximum concentrations of site parameters that are less than background UTLs may indicate that there is no site release



Summary

- A Draft Work Plan was submitted in May and field mobilization is scheduled for July 2003.
- Findings will be submitted in an addendum to the existing *Final Background Investigation Report, St. Juliens Creek Annex, Chesapeake, Virginia, October 2001*
- Questions and Comments??

Final Background Investigation Report, St. Juliens Creek Annex, Chesapeake, Virginia, October 2001



**Fiscal Year 2003 Investigations
at St. Juliens Creek Annex:
Site 8, Site 19, Site 21, AOC 1,
AOC 13, AOC 14, and AOC K**

St. Juliens Creek RAB
June 10, 2003

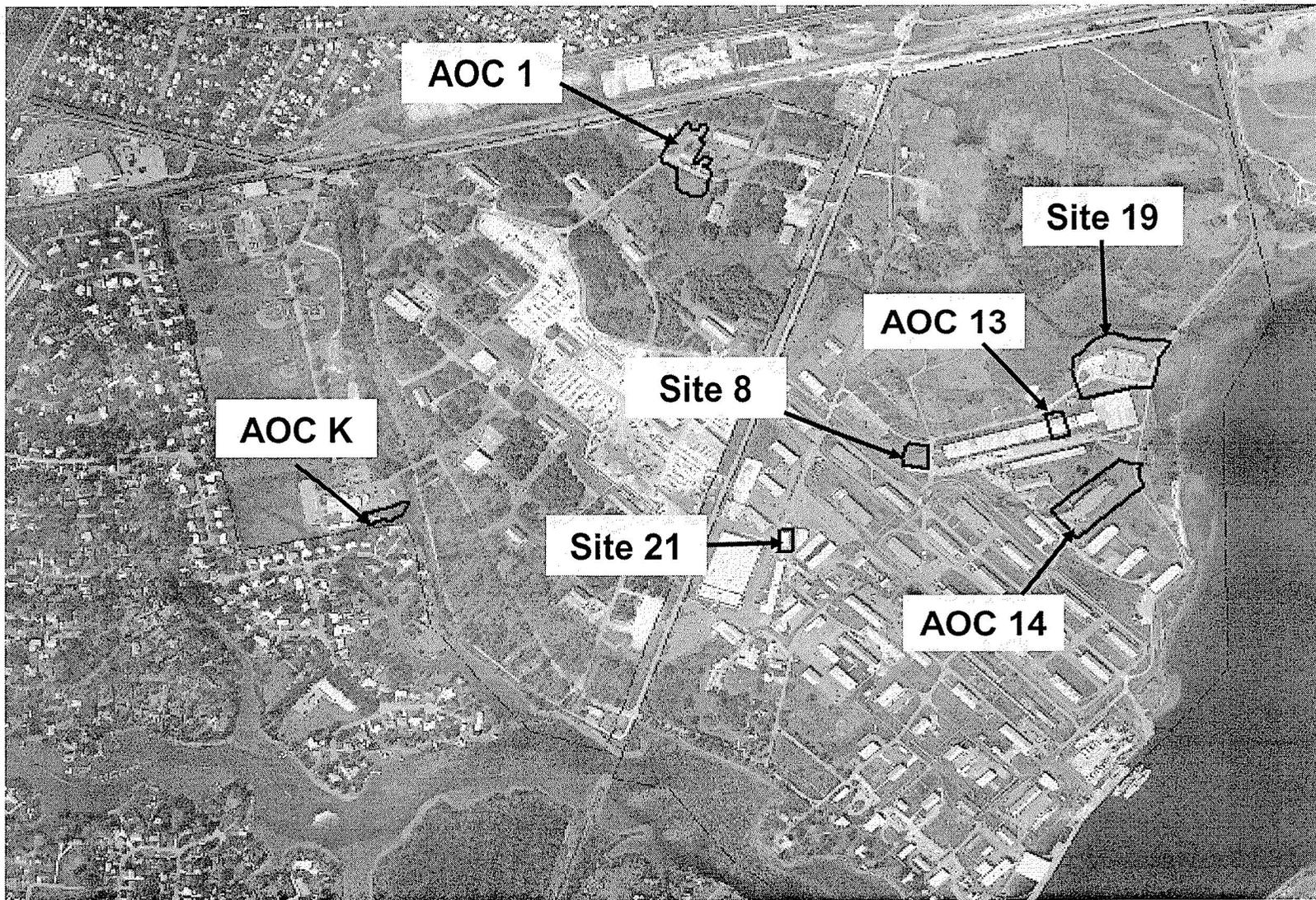


Purpose

- **Provide a brief historical description of each site and the reason for its environmental concern**
- **Present the proposed sample locations that will be used to further evaluate each site**
- **Ask for questions/comments**



Sites to be investigated in FY03





FY03 Investigations at Site 8, Site 19, Site 21, AOC 1, AOC 13, AOC 14, and AOC K

- **The number of samples, sample locations, and analyses were based on:**
 - **Previous study findings**
 - **Desktop review**
 - **Historical photograph review**
 - **Site visits**
 - **Discussions between Navy, EPA and VDEQ**



Site 8 (Cross and Mine) History

- From the 1950s through the mid-1960s, the site was used for disposal of rinse water from mobile insecticide and herbicide trucks
- Approximately 675,000 gallons of pesticide rinse water was allegedly discharged directly to the ground surface
- Soil and groundwater sampling was conducted in 1995
- No risks to human health or the environment were identified
- Concerns remain regarding the 675,000 gallons of rinse water (was it missed?)

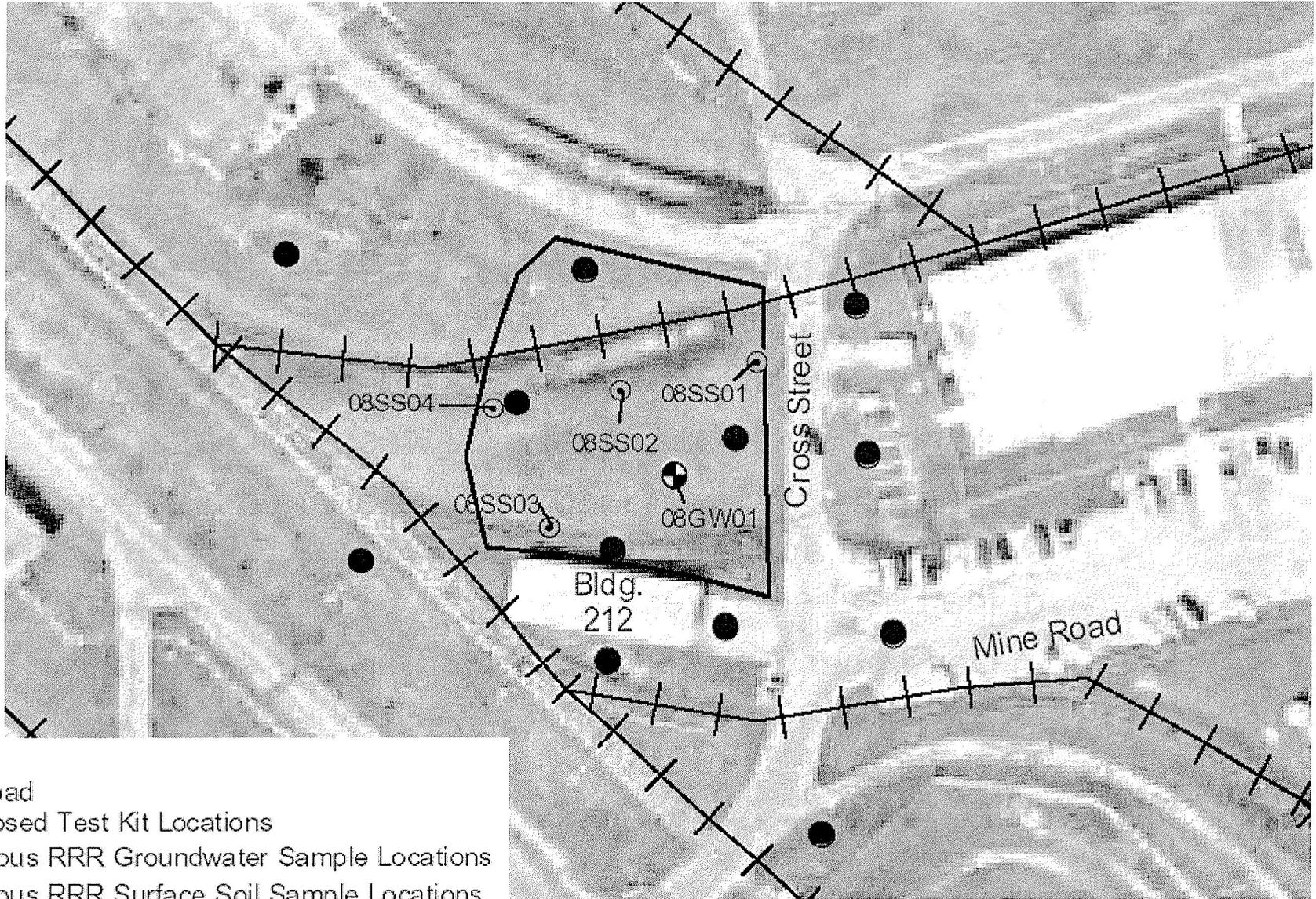


Site 8 (Cross and Mine) Further Evaluation

Groundwater sampling:

- Collect 12 groundwater samples from just below the water table by direct-push technology
- Determine the presence or absence of pesticide contamination using field screening test kits
- Results will determine the need and locations for the potential installation of monitoring wells
- If permanent monitoring wells are installed, samples will be collected for pesticides and metals

Site 8 Sample Locations



LEGEND

- ⊕ Railroad
- Proposed Test Kit Locations
- ⊕ Previous RRR Groundwater Sample Locations
- ⊙ Previous RRR Surface Soil Sample Locations
- Site Boundary



Site 19 (Bldg. 190) History

- **Ordnance management activities occurred at this location from the early 1900s through the 1970s.**
- **Previous sampling and activities:**
 - Soil and groundwater sampling was conducted in 1995 and potential risks to human health were identified
 - Building 190 was demolished between 2000 and 2001
 - A July 2001 site visit identified two concrete drainage swales that appeared to discharge to the Southern Branch of the Elizabeth River
 - In December 2001, interviews with former employees indicated concern regarding the ordnance loading operations at Bldg. 190

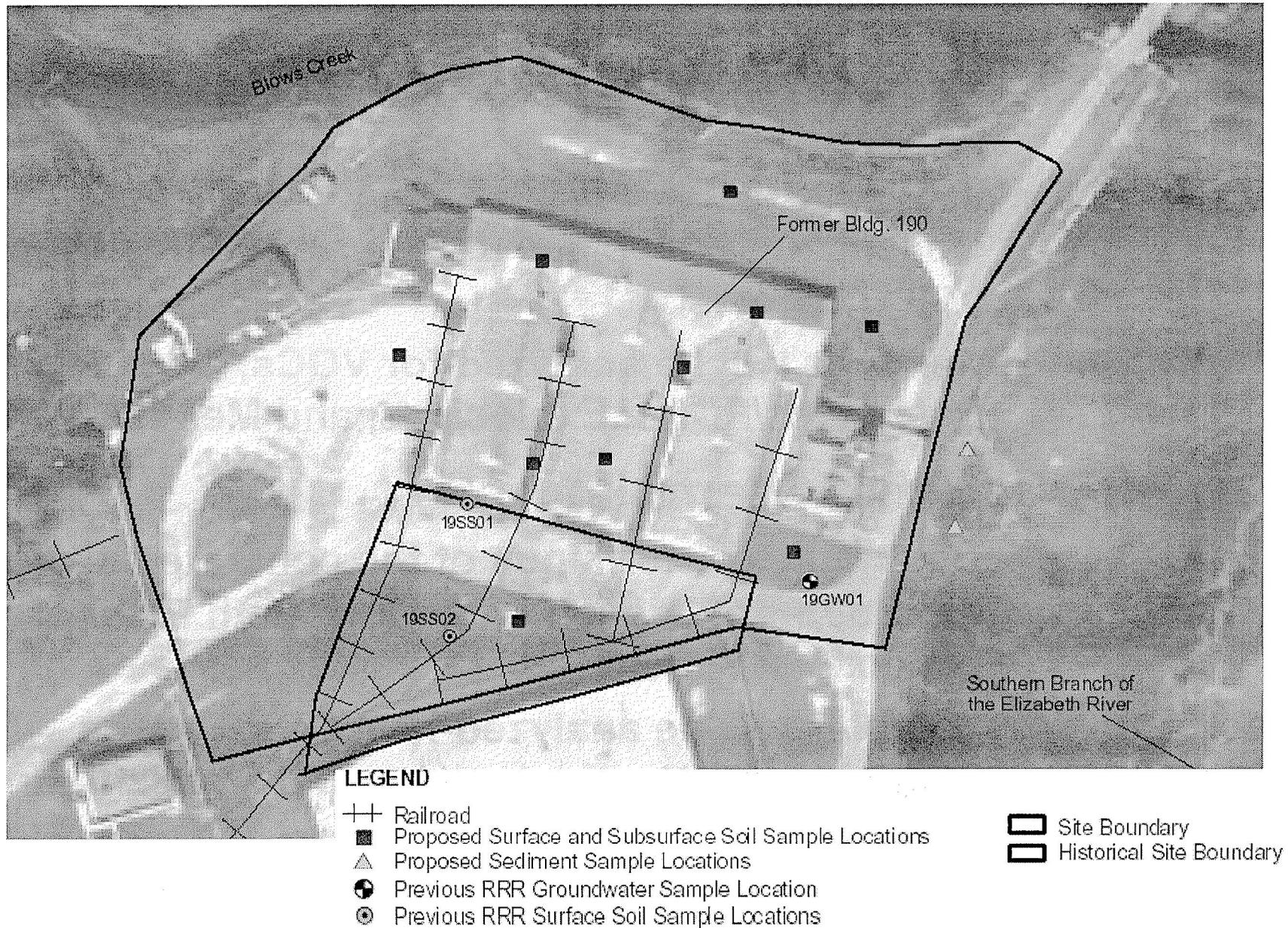


Site 19 (Bldg. 190) Further Evaluation

- **Soil sampling:**
 - Collect **10** surface soil (0-6") and **10** subsurface soil (1-3') samples
 - Samples will be analyzed for VOCs, SVOCs, Pesticides/PCBs, Explosives, and **Metals/Cyanide**
- **Sediment sampling:**
 - Determine the terminus of the concrete culverts in the Southern Branch of the Elizabeth River and collect 2 sediment (0-6") samples at the **outfalls**
 - Samples will be analyzed for VOCs, SVOCs, **Pesticides/PCBs**, Explosives, and **Metals/Cyanide**



Site 19 Sample Locations





Site 21 (Bldg. 187) History

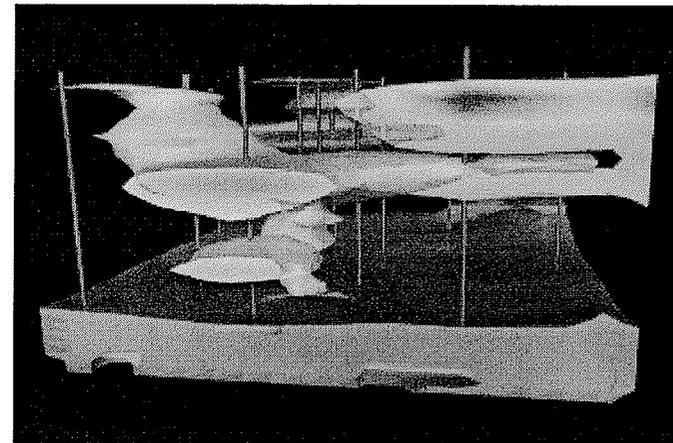
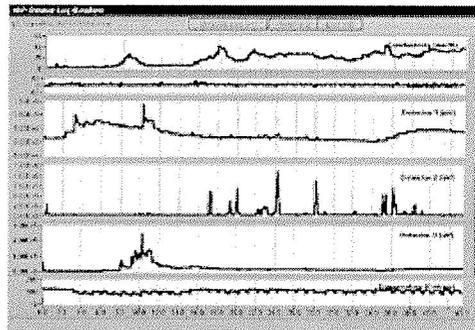
- Bldg. 187 was a locomotive shed used for maintenance
- 1981 Initial Assessment Study stated that the surrounding area was saturated with oil
- Previous sampling and activities:
 - Soil and groundwater sampling was conducted in 1995 and trichloroethene (TCE) was found in groundwater at Site 21 and nearby at Site 11. Site 11 was an electrical shop where TCE was used.
 - Sites 11 and 21 were recommended for further groundwater evaluation based on the TCE detections.
 - Building 187 was demolished in 2003 but the foundation remains intact.

Site 21 (Bldg. 187)



Site 21 (Bldg. 187) Further Evaluation

- **Membrane Interface Probe (MIP) sampling:**
 - Collect hydrogeologic and geochemical data at 10 to 20 locations using a MIP by direct-push technology
 - The MIP will provide a real-time lithologic profile continuously with depth to just below the confining clay layer (–20 feet) to delineate the TCE plume



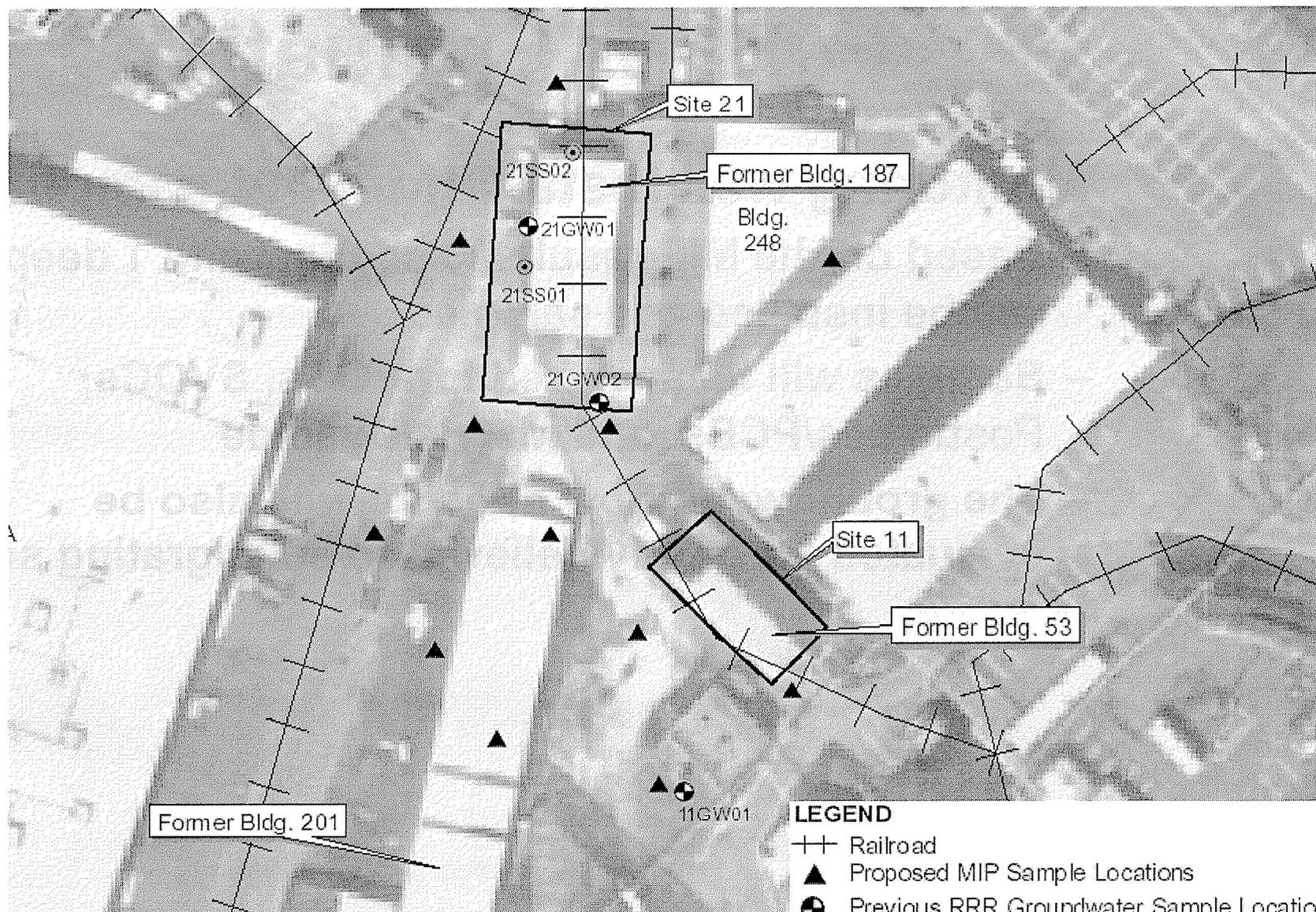


Site 21 (Bldg. 187) Further Evaluation

- **Monitoring well installation and sampling:**
 - Based on the MIP results, 6 shallow and 1 deep well will be installed and sampled
 - Samples will be analyzed for VOCs, SVOCs, Pesticides/PCBs, and Metals/Cyanide
 - The groundwater flow direction will also be evaluated (currently believed to be migrating south)



Site 21 Sample Locations



- LEGEND**
- ++ Railroad
 - ▲ Proposed MIP Sample Locations
 - Previous RRR Groundwater Sample Locations
 - ⊙ Previous RRR Surface Soil Sample Locations
 - ▭ Site Boundaries



AOC 1 (E St. and Marsh Rd.) History

- **AOC 1 was discovered during a historical aerial photograph review where ground scarring was identified as a possible waste disposal area in a 1937 photograph.**
- **Previous sampling and activities:**
 - Soil sampling was conducted in 2001 and further evaluation of surface soil was recommended based on elevated PAHs expected to be a concern to human health and the environment
 - Further delineation of site impacts were needed
 - During a recent site visit, a tar like substance and pieces of asphalt were found onsite



AOC 1 (E St. and Marsh Rd.) Further Evaluation

- **Soil sampling:**

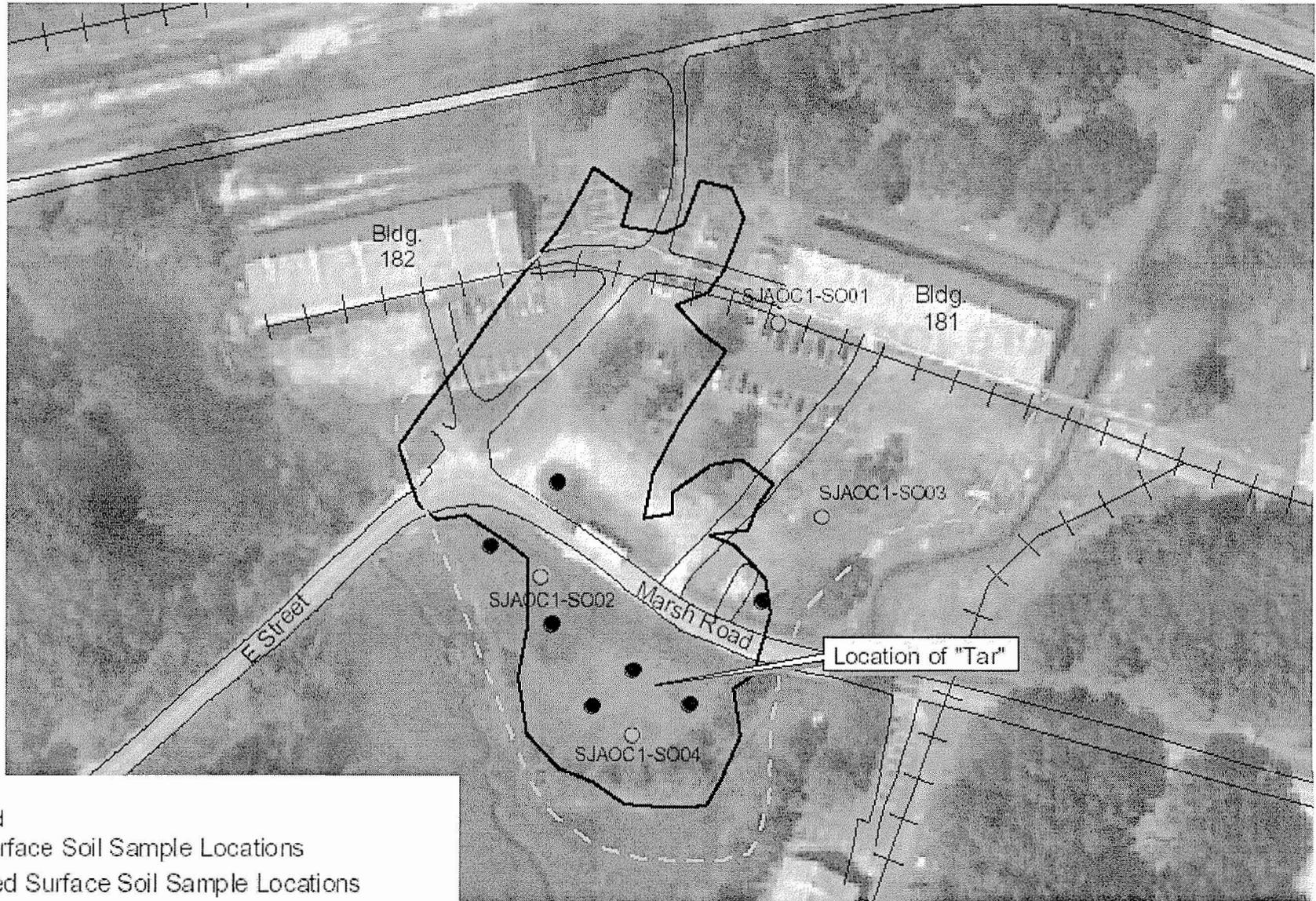
- Collect 10 surface soil (0-6") samples
- Samples will be analyzed for SVOCs

Sediment sampling:

- Will be conducted as part of the Baseline Ecological Risk Assessment (BERA) of Blows Creek in FY 2003
- Sediment samples will be collected at upstream, downstream, and adjacent locations to AOC 1



AOC 1 Sample Locations



LEGEND

- ++ Railroad
- SSA Surface Soil Sample Locations
- Proposed Surface Soil Sample Locations
- Site Boundary
- Extent of 1937 Ground Scarring



AOC 13 (PCP Dip Tanks) History

AOC 13 is located in the open bay of Bldg. M-3 where two pentachlorophenol (PCP) dip tanks were located along the western wall.

The tanks were in operation for approximately 2 years during the Korean War, from 1951 to 1953.

- Conveyor belts extended through the bay wall into the tanks.**
- No known releases have occurred.**

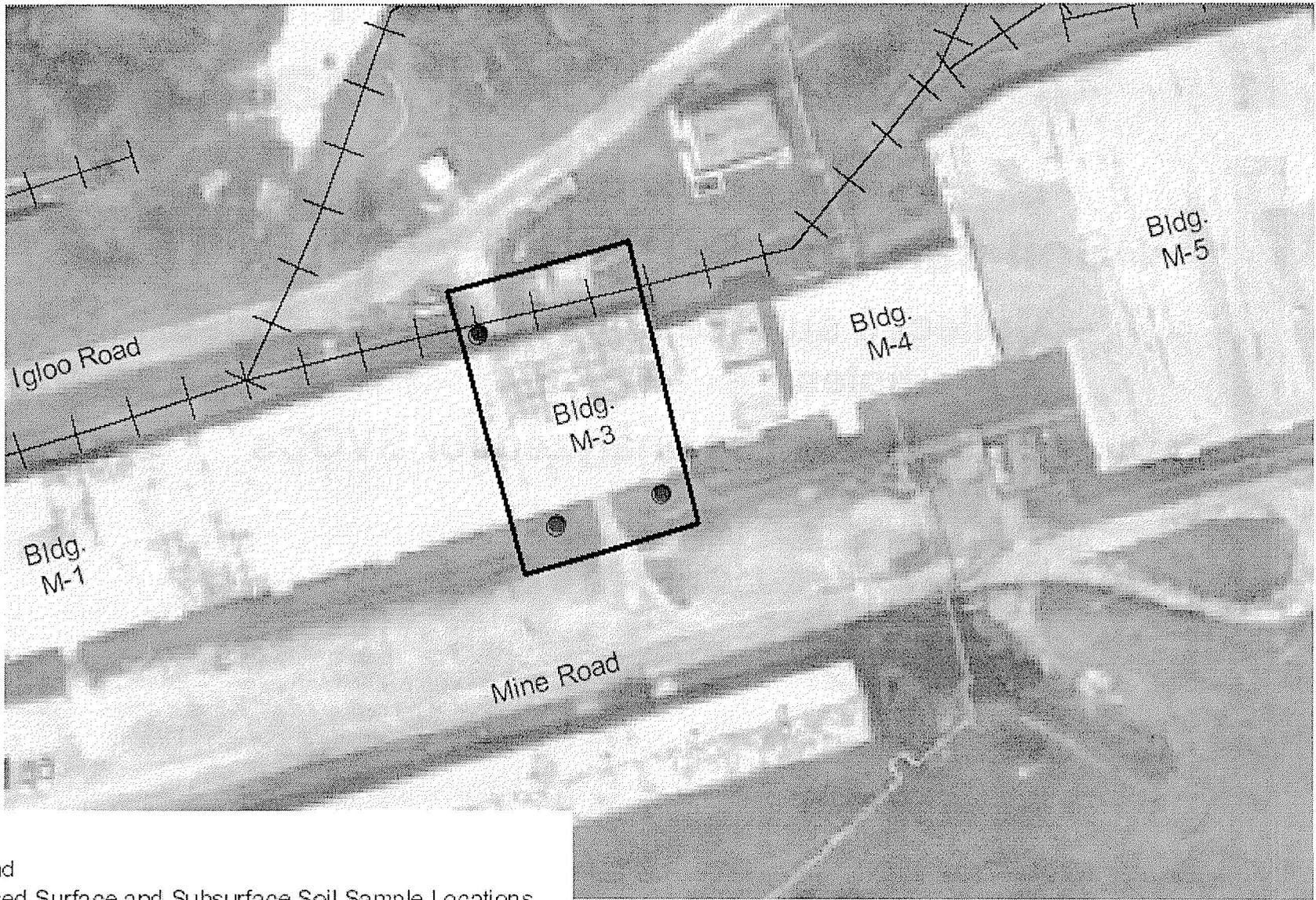


AOC 13 (PCP Dip Tanks) Further Evaluation

- **Soil sampling:**
 - **Collect 3 surface soil (0-6") and 3 subsurface soil (1-3') samples**
 - **Samples will be analyzed for SVOCs**



AOC 13 Sample Locations



LEGEND

- ++ Railroad
- Proposed Surface and Subsurface Soil Sample Locations
- Site Boundary



AOC 14 (Bldg. 89) History

- Bldg. 89 was used for loading projectiles, including 8" and 16" shells of explosive D compounds.
Operations occurred from the 1920s through the **1970s**.
The bldg. was demolished sometime after 1999.
- No known releases have occurred, but the nature of the activities are a potential concern.
- In December 2001, interviews with former employees indicated concern regarding the ordnance loading operations at Bldg. 89.



AOC 14 (Bldg. 89) Further Evaluation

- **Soil sampling:**
 - Collect 8 composite soil (0-3') samples
 - Samples will be analyzed for VOCs, SVOCs, Pesticides/PCBs, Explosives, and Metals/Cyanide
- Based on the results of the soil sampling event, groundwater may be evaluated at a later date.

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AOC 14 Sample Locations



LEGEND

- ++ Railroad
- Proposed Composite Soil Sample Locations
- Site Boundary



AOC K (Former STP) History

- **Former sewage treatment plant (STP) operated from 1942 until 1947 and handled waste from onsite barracks.**
- **No known releases have occurred.**
- **The SJCA Partnering Team recommended further evaluation based on the potential for mercury contamination from trickling filters that may have been part of the STP.**

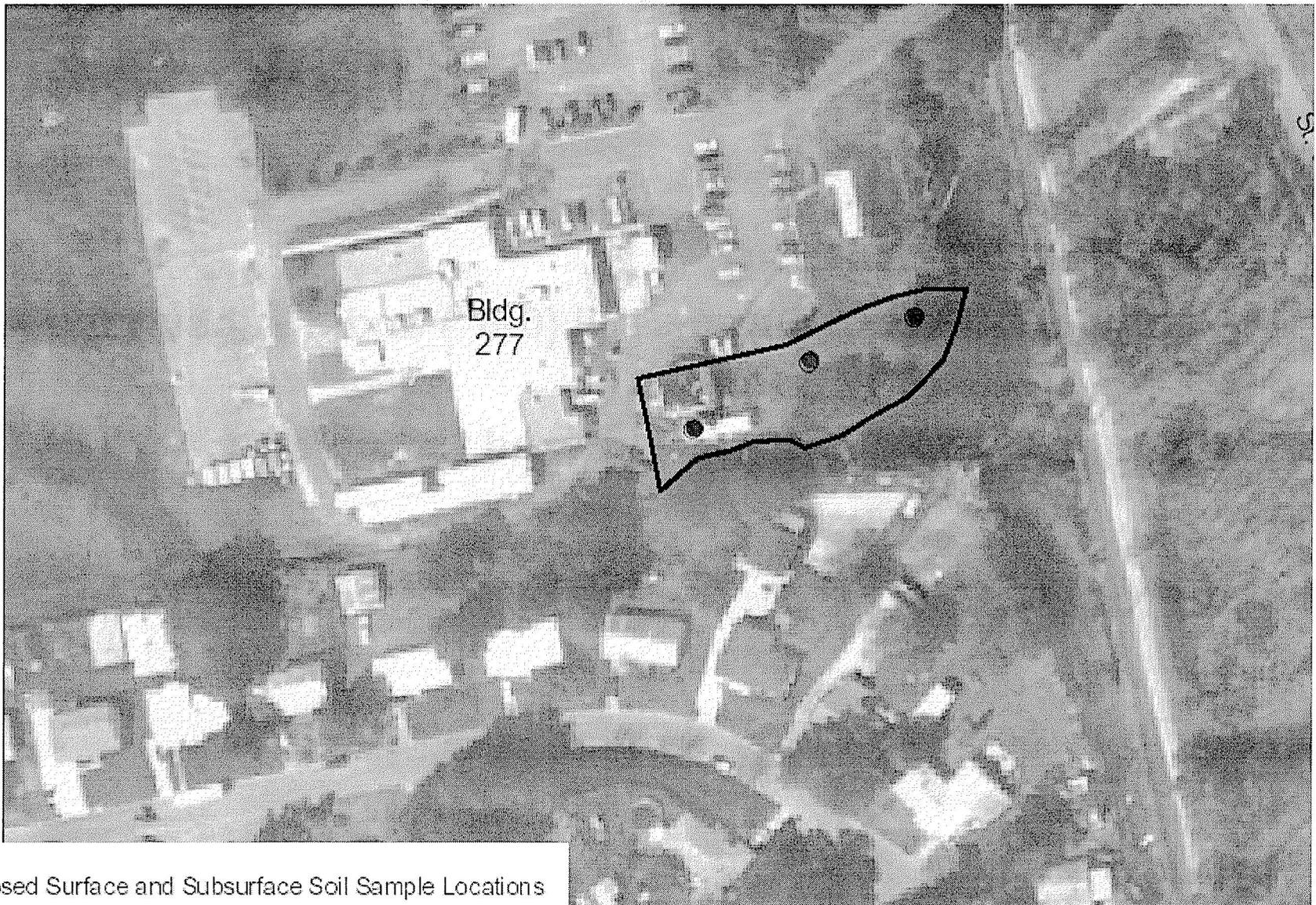


AOC K (Former STP) Further Evaluation

- **Soil sampling:**
 - **Collect 3 surface soil (0-6") and 3 subsurface soil (1- 3 samples**
 - **Samples will be analyzed for Mercury**



AOC K Sample Locations



LEGEND

-  Proposed Surface and Subsurface Soil Sample Locations
-  Site Boundary



Conclusion

- **A Draft Work Plan was submitted in May and field mobilization is scheduled for August 2003.**
- **Findings will be submitted in a Site Investigation report for Sites 19, 21, and AOC 1 and an a Site Screening Assessment evaluation report for Site 8 and AOCs 13, 14, and K. The reports will include human health and ecological screening evaluations.**
- **Questions and Comments??**



RISK ASSESSMENT

Heidi Maupin, M.S., P.E.

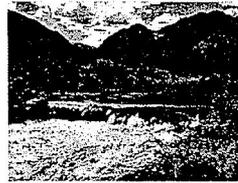
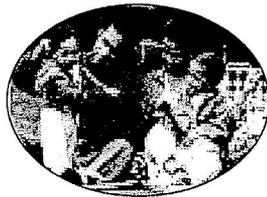
EP Protecting Human Health by
Protecting the Environment

COMPLETED PATHWAY

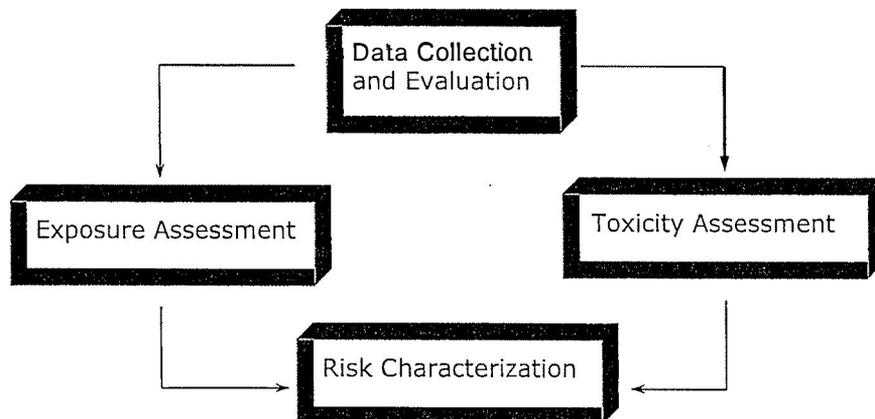


AREAS OF FOCUS

Human Health Evaluation
Ecological Evaluation



FOUR STEPS IN THE PROCESS



Step 1: DATA COLLECTION

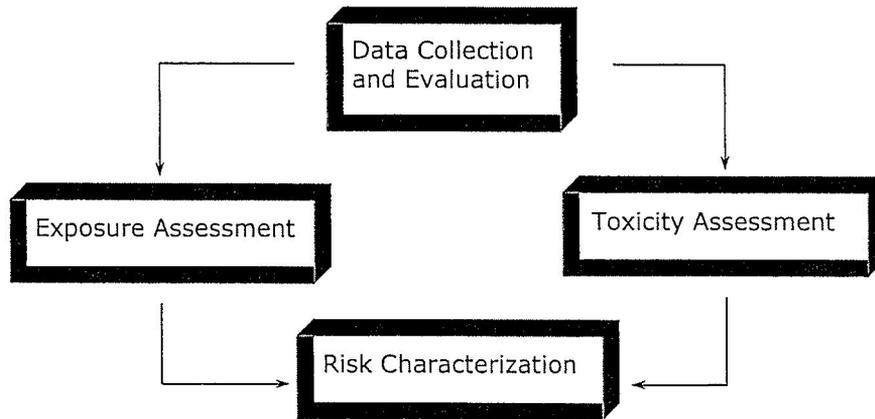
MEDIA PARAMETERS

- Soil
- Groundwater
- Surface water
- Sediment
- Air
- Biota

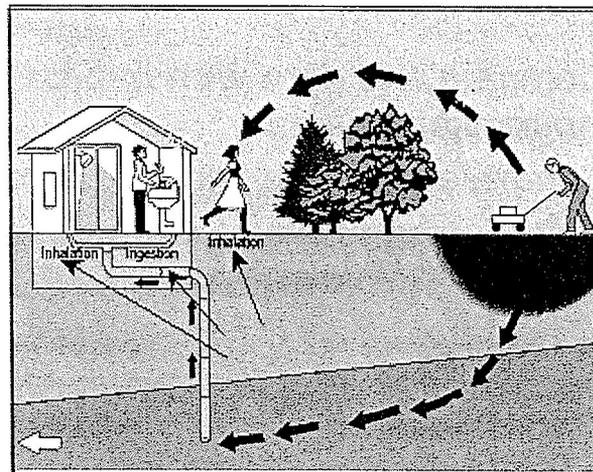
DATA EVALUATION

- Compare site data with risk-based comparison values
 - Compare site data with background
- Identify chemicals of potential concern (COPCs)

FOUR STEPS IN THE PROCESS

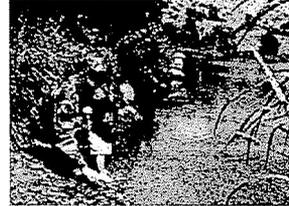


TYPES OF EXPOSURE



WHO COULD BE EXPOSED?

- Residents
- Workers
- Visitors or Trespassers
- Sensitive Subpopulations
 - School children
- Future Population Groups



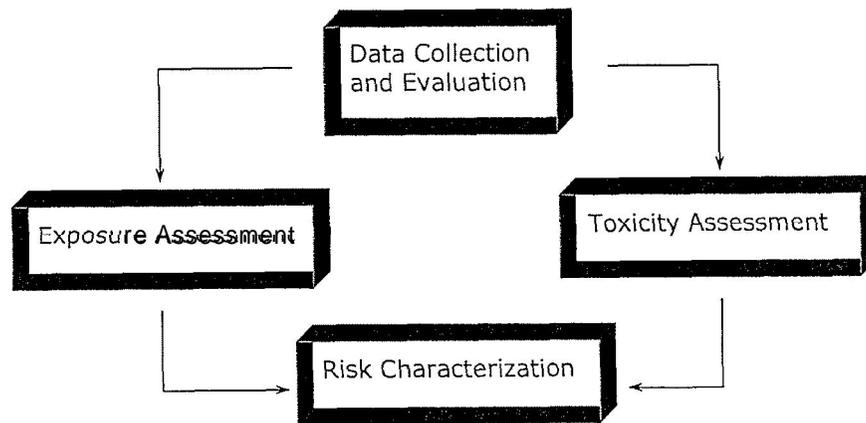
EXPOSURE PATHWAY EXAMPLE

Exposure Pathways for Site 3									
Media	Exposure Route	Future						Current	
		Resident		Recreation		Industrial Worker	Construction Worker	Recreation	
		Adult	Child	Adult	Child			Adult	Child
Surface Soil	Ingestion							X ¹	
	Dermal							X ¹	
	Inhalation								
Surface and Subsurface Soil	Ingestion	X	X	X	X	X	X		
	Dermal	X	X	X	X	X	X		
	Inhalation	X	X			X	X		
Groundwater Deep Aquifer	Ingestion	X	X			X			
	Dermal	X	X			X			
	Inhalation	X	X			X			
Groundwater Shallow Aquifer	Ingestion						X		
	Dermal						X		
	Inhalation						X		

X Quantitative Evaluation

1 Current and future scenario are the same.

FOUR STEPS IN THE PROCESS



STEP 3 TOXICITY ASSESSMENT

"All substances are poisons.
The right dose differentiates
between a poison and a remedy."

Philipus Aureolus Theophrastus Bonmastes von Hohenheim-Paracelsus (1493-1541)

SOURCES OF TOXICITY INFORMATION

IRIS - Integrated Risk Information System
HEAST - Health Effects Assessment
Summary Tables

TOXICITY ASSESSMENT

HEALTH OUTCOMES

- **Non-Carcinogenic (Non-Cancer)**
- **Carcinogenic (Cancer)**

TOXICITY ASSESSMENT

NON-CANCER OUTCOMES

Reference Dose (RfD): An estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to cause adverse effects during a lifetime.

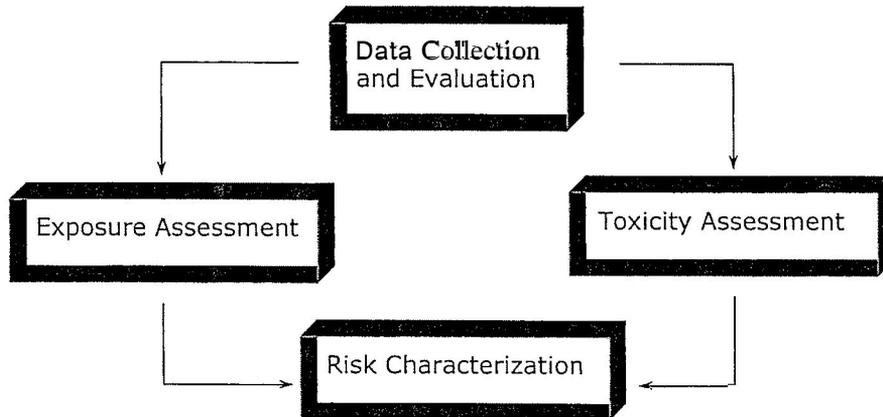
TOXICITY ASSESSMENT

Cancer Outcomes

Dose-Response: response is increased tumors

- Presence of tumors indicates carcinogen
- Assume no threshold (safe) value

FOUR STEPS IN THE PROCESS



RISK CHARACTERIZATION

NON-CANCER EFFECTS are characterized by comparing exposure intakes to RfDs, resulting in a Hazard Quotient (HQ).

Hazard Quotients are summed across chemicals and pathways to produce a Hazard Index (HI). HUMAN HEALTH ONLY!

The US EPA Hazard Index of concern is a Hazard Index greater than or equal to 1.

RISK CHARACTERIZATION

CANCER EFFECTS are characterized as a probability of developing cancer over a lifetime, above background. Also called an Incremental Risk of developing cancer.

Risks are summed across chemicals and pathways to arrive at an overall risk for each potential receptor.

INCREMENTAL RISK

The additional risk of cancer, above the background incidence, caused by exposure to substances in the environment.

LIFETIME CANCER RISKS IN THE UNITED STATES

Lifetime risk refers to the probability that an individual, over the course of a lifetime, will develop cancer.

Men: lifetime risk is 1 in 2



Women: lifetime risk is 1 in 3



Source: Cancer Facts and Figures - 2001
American Cancer Society

RISK LEVELS

CANCER EFFECTS

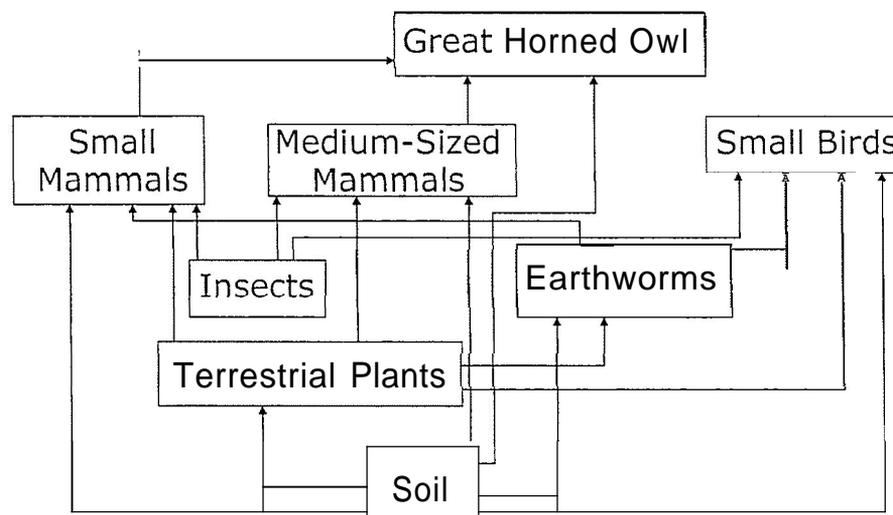
The US EPA acceptable risk values for excess cancer (above background) are values in the range of one in ten thousand to one in a million.

OVERVIEW OF ECOLOGICAL RISK ASSESSMENT

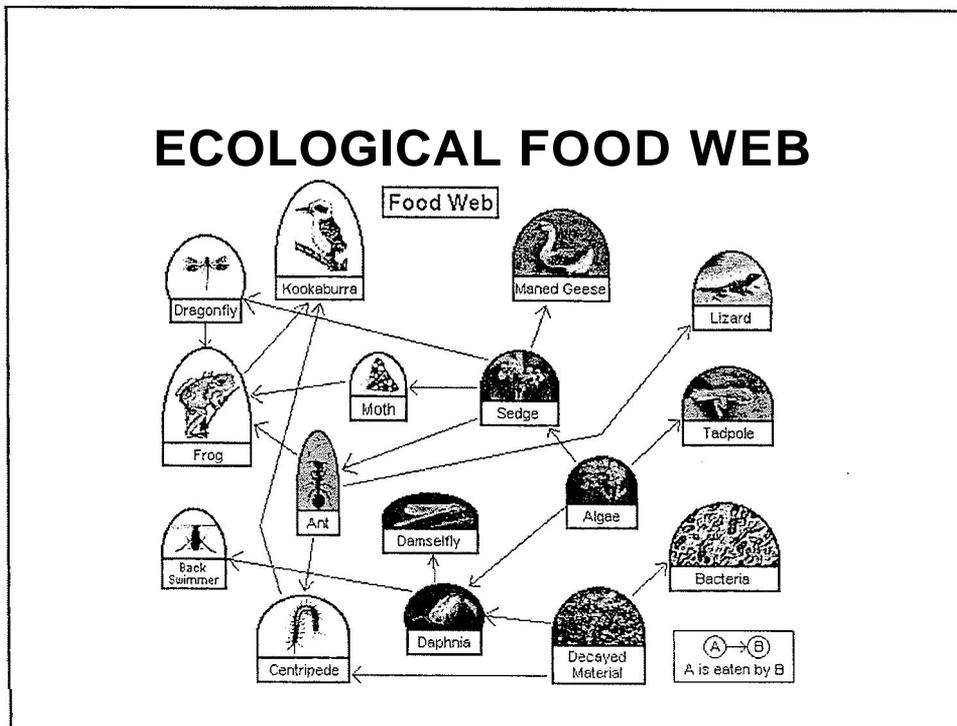
■ What is an Ecological Risk Assessment?

A study that determines whether chemicals at a site have the potential to cause harmful effects on plants and animals at the site

GREAT HORNED OWL FOOD WEB



ECOLOGICAL FOOD WEB



RESULTS OF BASELINE ECOLOGICAL RISK ASSESSMENT

- 'Risk is described for specific plants/animals and quantified using a Hazard Quotient
- Includes information about 'uncertainty'

CLEAN-UP ALTERNATIVES EVALUATION

- Evaluation of clean-up alternatives
 - Based on the Nine CERCLA Evaluation Criteria
- Evaluation considers
 - Protectiveness of both ecological resources and human health
 - Long and short term success
 - Implementation impacts
 - No action alternative
 - Costs
 - Community and state acceptance

CONCLUSION

Risk assessment is designed to be protective of human health and the environment

- Risk Assessment is a decision making tool used by environmental regulatory agencies.
- Risk Assessment results are used to help set cleanup levels.