IMFD–SEE 8 MARCH 2017

MEMORANDUM FOR RECORD

SUBJECT: Fort Detrick Restoration Advisory Board (RAB) Meeting Summary,
8 MARCH 2017

1. Summary Contents

Items addressed at the meeting are listed below, with corresponding section numbers indicated in the column on the right.

Please note: PowerPoint presentations were utilized during the RAB meeting. A copy of the presentations is attached to these minutes and is incorporated into these minutes by this reference.

Text contained within brackets [] has been added for clarification purposes.

2. Attendees

Members Present:
Dr. Gary Pauly, Community RAB Member, Co-Chair
Mr. Robert Craig, Army Co-Chair
Mr. Joseph Gortva, Fort Detrick, Environmental Restoration Program Manager
Mr. Rolan Clark, Community RAB Member
Dr. Barbara Brookmyer, Frederick County Health Department
Dr. Elisabeth Green, Maryland Department of the Environment
Ms. Jennifer Hahn, Community RAB Member
Mr. Cliff Harbaugh, Community RAB Member
Mr. Karen Harbaugh, Community RAB Member
Mr. George Rudy, Community RAB Member
Mr. Rob Thomson, US Environmental Protection Agency

Others Present:

Mr. John Buck, US Army Corps of Engineers
Ms. Juliann Albowicz, US Senator Chris Val Hollen's Office
Ms. Regan Riley, Congressman John Delaney's Office
Ms. Kate Masters, Frederick News Post
Mr. John Cherry, ARCADIS
Mr. Brandon Fleming, USGS
Mr. Keith Hoddinott, US Army Public Health Center
Ms. Shelly Morris, On-Site Contractor to Fort Detrick Environmental Restoration Program
Mr. Christian Smith, Fort Detrick Environmental Program
Mr. Rob Wasserman, ECC
Ms. Katrina Harris, Bridge Consulting Corp.

Members Absent:
Mr. Eli DePaula, Community RAB Member
Dr. Henry Erbes, Community RAB Member
Mr. Barry Kissin, Community RAB Member

3. Meeting Opening / Remarks

Mr. Joe Gortva opened the meeting, welcomed everyone, and thanked everyone for attending. Mr. Gortva invited everyone to introduce themselves and also reminded everyone to sign-in on the sheets on the back table. Mr. Gortva stated he had distributed to the RAB members a copy of the most recent draft of the RAB's operating procedures for a final review prior to a vote at the next meeting.

Mr. Gortva announced tonight was Mr. Bob Craig's last meeting before retirement. Mr. Gortva said Mr. Craig would truly be missed in the environmental office. Mr. Craig said the interaction with the RAB members over the years has been a great experience. He stated Fort Detrick is a very technically challenging site and expressed his appreciation for allowing the members to

share a part of his 38-year Army career with them. The Board expressed their well wishes to Mr. Craig for his retirement.

Mr. Joe Gortva reviewed the meeting agenda.

4. Meeting Minutes presented by Mr. Joseph Gortva, Fort Detrick

Mr. Gortva said hard copies of the minutes had been distributed and he would send electronic copies the next day. He said he also had provided hard copies of plume maps as requested at the last meeting and would send electronic copies the next day. Ms. Jennifer Hahn asked if a map could be provided which shows new development, the potential new road, road names, and more community landmarks. Mr. Gortva said he would look into producing such a map.

5. Area B Site Inspection Report Overview presented by Mr. John Cherry, Arcadis

Mr. Cherry stated he would first be giving an update on the Site Inspection at Area B.

Mr. Cherry reminded the Board of the archive records review done by the Army Corps of Engineers which led to two reports being issued in 2012 and 2014. He stated the documents assessed whether there had been prior activities at Area A and Area B that might warrant further environmental investigation. He said five sites were determined to need further investigation at Area B--two former herbicide sites, a rice blast disposal area, and two storage or other miscellaneous use sites.

Mr. Cherry noted the Site Inspection is one of the very early steps in the CERCLA process where sites undergo a very preliminary investigation to determine if a more detailed investigation is needed.

Mr. Cherry discussed the background of the two former herbicide test sites. He explained in the 1940s and 1950s, there was some limited testing of anti-crop agents on Area B. He stated the tests were done at small-scale test plots, 9 feet by 9 feet or 15 feet by 18 feet, and the testing was completed with small hand-held sprayers often in enclosed areas to keep a mixture from impacting an adjacent plot. He advised the scientists doing the tests kept detailed records about the herbicides being tested, and the archive search team went through all those records and were able to estimate the quantities of herbicides used. Mr. Cherry said the archive search team also identified several categories of herbicides that were tested, including 2,4,5-T which was a component used in the formulation of Agent Orange, and some arsenic-based herbicides. He noted that while the records indicated small quantities were tested, the Army felt including the test sites in the Site Inspection was prudent.

Mr. Cherry advised surface and sub-surface soil samples were collected and analyzed for metals and dioxins. He explained dioxins are a contaminant present from the manufacture of 2,4,5-T, can be persistent in the environment, and thus can be detected many decades after use. He further explained that arsenic-based herbicides break down quickly. He stated the rationale for testing for dioxins was to see if a particular dioxin was found which would indicate potential impacts from herbicide testing. Mr. Cherry said the analysis of the samples were evaluated

against background levels and EPA regional screening levels, and there were no concentrations of concern from a human health perspective. He advised the report will be recommending no further action at these areas.

Mr. Cherry next discussed the rice blast disposal area. He explained rice blast is an anti-crop agent that was tested at Fort Detrick. He said in 1973, after a decontamination and incineration process and testing to ensure there was no active biological material still present, the inert residue was spread on a half-acre of Area B. He advised that since dioxins can be a residual contaminant from incineration, the soil was sampled for dioxins during the Site Inspection. Mr. Cherry said the results of the soil sample analysis found no detection of any concentrations that indicate the potential for human health impacts. He stated the report will recommend no further action.

Mr. Cherry next discussed the incline test shed and the test chamber, noting only a limited amount of historic information was available on these two buildings. He stated they are shown on hand-drawn sketches from maps dating back to 1966 and 1975. He noted they were located fairly close to the demolition pit, so there is some speculation they were for explosives use or storage. Mr. Cherry said the analysis of soil samples at this site had an expanded list of parameters including metals, explosives, and semi-volatile organic compounds. He advised the analysis found no metals, explosives or semi-volatile organic compounds at levels of concern so the report will recommend no further action.

Ms. Hahn asked how deep the soil samples were collected, and Mr. Cherry advised the sub-surface samples were collected at two to four feet deep. Ms. Hahn asked if rain could have pushed the contamination deeper, and Mr. Cherry responded the Army and the regulators agreed the depth was adequate for an initial assessment of impacts. Dr. Gary Pauly noted these types of contaminants generally do not migrate very much. Mr. Gortva added these types of contaminants tend to sorb onto the clay in the soil so if present they would be expected to be within the depths sampled.

Mr. Cherry said the other area investigated was Building 1223, a former solvents and flammables storage area. He noted the building was razed in 1979. Mr. Cherry advised the surface and sub-surface soil samples were analyzed for volatile organic compounds, and none were detected above EPA regional screening levels. Mr. Cherry stated the report will recommend no further action for this site.

Mr. Cherry advised the report will be submitted to the Army in about a week for review and then submitted to the regulators for review.

Ms. Hahn said she would like the minutes to reflect that no further action is being recommended just for these specific sites and not for all of Area B.

Mr. Craig asked about the Site Inspection being conducted at Area A. Mr. Cherry said there are a few sites in that report where further action is being recommended. He advised the Area A report will be submitted to the Army in a few weeks.

6. Area B Groundwater Remedial Investigation Status presented by Mr. John Cherry, Arcadis

Mr. Cherry showed a map of Area B and reminded the Board there is much work going on at Area B, and tonight he would only be discussing shallow groundwater contamination in the Montevue area where there had been a tetrachloroethylene (PCE) detection. He stated the detection led to the installation of a number of small-diameter monitoring wells. Mr. Cherry said he would also be discussing the additional work conducted related to Carroll Creek and in off-post areas.

Mr. George Rudy asked if off-site remediation activities are a possibility. Mr. Gortva responded that the Army is discussing pilot-scale testing; however, any remedy would not be selected until after the Feasibility Study and Proposed Plan are completed. He noted the Area B Groundwater is still in the Remedial Investigation phase, with the Feasibility Study being the next step.

Mr. Cherry advised the Supplemental Remedial Investigation work plan had a number of different tasks which were approved by the regulators. He said the first step was to conduct some soil gas sampling around existing buildings on the Montevue property. Mr. Cherry said there are vehicle maintenance and other activities conducted around these buildings where PCE was previously detected and the source of the PCE was inconclusive. He said 10 soil gas sampling probes were advanced through pavement or concrete around the building following a building inspection to see if there was any documented use of the compounds (none was found). Mr. Cherry advised some low-level soil gas concentrations were detected so eight new monitoring wells were installed; the installation was completed the prior week. He advised the wells will be sampled in a few weeks, and then a second round will be collected in the future. He noted the network of existing small diameter wells will also be sampled. Mr. Cherry said a special lab forensics analysis will be done to try and fingerprint PCE, trichloroethene (TCE), and chloroform to help evaluate potential connections with downgradient concentrations and tying back to the source area. He noted this information will be incorporated into the conceptual site model.

Ms. Hahn asked about the potential for vapor intrusion in the nearby buildings and whether the people in the building have been informed about the investigation and sampling results. Mr. Gortva responded he wanted to make sure buildings are not being confused. He said the newly repurposed County building was tested, and there was no vapor intrusion issue. Mr. Rudy asked if the building would be periodically re-checked, and Mr. Gortva responded that unless there were fluctuations in the groundwater sampling results, there is no need to continue to conduct vapor intrusion testing at the building. Mr. Gortva said if the wells installed around the nursing home show a potential for concern, the Army would test for vapor intrusion in the nursing home. Mr. Gortva said the maintenance building is still using products that contain these solvent compounds in them so it may not be possible to distinguish between what is being used inside the building and what may be from another source.

Ms. Hahn stated the PCE detection was found in shallow groundwater at about 10 feet; she asked what was the shallowest well installed. Mr. Gortva said he believed the detection was at 60 to 70 feet deep. Mr. Gortva said the piezometers were installed at “first water” meaning as soon as groundwater was encountered. Ms. Hahn said her concern was contaminants might be present at

a very shallow depth, and thus indicate a need to conduct vapor intrusion testing, but might be missed by wells installed much deeper. Mr. Cherry said the shallowest groundwater is being sampled at this area, and the new wells will give a better characterization of groundwater flow direction in this area. He said a comprehensive round of water level measurements will be taken, along with readings from gauges in the streams.

Mr. Rudy asked what would occur if the PCE is determined to be from a local, non-Army source. Mr. Gortva said the information would be turned over to Maryland Department of the Environment. Mr. Rudy asked if Maryland Department of the Environment would follow up, and Ms. Green said if the levels were significant, the State would follow up.

Mr. Cherry next discussed recent off-post field activities. He stated the 2010 work plan included drilling in some off-post areas to see if there had been impacts; a few wells could not be installed as rock was encountered at shallow areas. He explained the new scope of work provided for the use of a rotary rig and was successful in completing four new monitoring wells. He stated these monitoring wells will be helpful in providing data on groundwater conditions south of Carroll Creek and the streams.

Ms. Karen Harbaugh asked if the wells were installed before or after the new sewer system, and Mr. Cherry responded they were installed within the last few weeks so it was after the sewer work.

Mr. Cherry next reviewed the recent work related to Carroll Creek, noting it involved resurveying the stream to address questions about some springs and seeps. He stated springs and seeps had been sampled, and there were some TCE detections; EPA requested any seeps and streams in the downgradient portion of Carroll Creek not previously identified and sampled be sampled. Mr. Cherry said the area was re-surveyed, and no additional seeps or streams were identified in that area. Mr. Cherry said upcoming work includes collecting surface water samples up and down the length of Carroll Creek and collecting about 20 pore water samples from points in the bed of the stream to assess whether groundwater is entering the stream bed with solvent concentrations. He stated this additional data will provide a much better idea of groundwater contaminant contributions across the Creek and help make decisions based on the data. Mr. Cherry said EPA requested fingerprint analysis on four or more of the pore water samples so after the data is received, the fingerprint analysis will be done on the samples with the highest concentrations.

Mr. Cherry showed a picture of the infrared device used by the field crew to walk and scan the stream which is able to distinguish between the temperature of groundwater and stream water at this time of year when groundwater is much warmer than the stream water. He stated use of the device provides a high level of confidence in identifying seeps and streams.

Mr. Cherry said much new data will be received in the coming weeks to address the lingering questions the Army, Arcadis and the regulators have had about the Area B groundwater. Mr. Cherry advised work will continue into April 2017. He stated further remedial investigation work is not anticipated being recommended by the regulators, but the regulators will be providing their input and comments on the Remedial Investigation Report which includes human

health and ecological risk assessments. Mr. Cherry said this report will support the next step, the Feasibility Study which evaluates potential remedies.

Mr. Gortva added that the usefulness of the fingerprint analysis will not be known until after it is completed since this is newer technology and will be the first time used at the site.

Ms. Hahn asked about the impacts of the Federal budget and whether there is funding to move forward. Mr. Craig said different budgets exist such as the Department of Defense budget and the EPA budget. Mr. Craig said EPA's budget could be reduced, but it does not mean the Department of Defense's environmental work will stop. Mr. Rob Thomson said there is currently an April 28 budget expiration date, and no one is sure what will happen on that date. He said the next fiscal year budget starts in October, and some budgets may experience cuts but the level of funding is not known. Ms. Hahn expressed her desire that EPA continue to be present at Board meetings to provide the community members with their input.

7. **Area B Landfill Cap Monitoring Network Expansion** presented by Mr. John Buck, US Army Corps of Engineers, Baltimore District

Mr. John Buck referred to the map of Area B groundwater from Mr. Cherry's presentation. He stated there are more than 80 groundwater monitoring wells, but he would be specifically discussing the wells marked in yellow on the map which surround the capped disposal areas. Mr. Buck said there is a legal requirement to monitor the individual disposal areas and an extensive well network is in place. He advised in discussions with the regulatory agencies some data gaps were identified in the existing network so some additional overburden (loose material above bedrock) wells and shallow bedrock wells are going to be drilled to get a better understanding of conditions in those areas. Mr. Buck advised there are currently 32 wells, and 16 wells will be added (10 additional overburden wells and 6 shallow bedrock wells). He stated the drilling will be done by the US Army Corps Field Exploration Unit, and the sampling will be done by Army contractors. Mr. Buck explained the wells will be installed at the perimeter of the landfill caps and will not go through the caps. Mr. Gortva noted the Corps will also be drilling four additional shallow wells to replace existing wells that have been dry during the dry seasons. Mr. Buck said the drilling is scheduled for the spring of 2017.

Mr. Buck advised lysimeters will be installed, in addition to the wells, to determine if water is percolating through the caps. He explained the intent of the caps is to prevent direct exposure to buried waste and to minimize infiltration of rainwater going through soil and waste and into the groundwater. He continued explaining the lysimeters will measure the effectiveness of the caps in reducing percolation of water through the soil column. He said a pair of lysimeters will be installed at each disposal area, with one going under the cap but not into the waste and one parallel to the capped area so the difference between the two can be measured. Mr. Buck stated the lysimeter will provide an additional line of evidence to evaluate the effectiveness of the caps. Mr. Buck said the location of the solar panels and potential new road were taken into consideration in locating the lysimeters.

Mr. Buck displayed a map showing the location of the new wells and a graphic of how the lysimeters will be placed to take comparative measurements.

Mr. Rudy asked if the lysimeters provide real time reporting or if readings are taken periodically. Mr. Buck responded measurements will be periodically collected.

Mr. Thomson said the data will be incorporated into five-year review reports where the effectiveness of remedies are re-evaluated.

Ms. Harbaugh asked if lysimeters have been used at other sites, and Mr. Buck responded they have been used at other sites.

Ms. Green asked how deep the lysimeters are installed. Mr. Buck responded that the exact depth will be dictated by field conditions but will be approximately 40 feet.

Ms. Hahn asked if the Army is going to stop using herbicides around the caps. Mr. Gortva responded that the weeds need to be controlled so the grass is not killed off over time as the grass roots hold the caps in place. He said the herbicide being used is to control Johnson Grass and thistles as required by Maryland Department of the Environment regulations.

8. Kemp Lane Potable Water Connections Update presented by Mr. Rob Wasserman, ECC

Mr. Rob Wasserman provided an update on the five Kemp Lane residences being connected to a potable public water supply and the abandonment of the current private wells the residents use for drinking water. Mr. Wasserman said the work has been completed except for some site restoration. He advised the field activities began on January 27 and were completed on February 14 including well abandonment. He stated the lines were put into service on February 8 and 9.

Mr. Wasserman noted final site restoration work needs to be completed, and each property will be re-visited to ensure the property was returned to the original condition. He noted a summary report will be submitted to the Army.

Mr. Rudy asked for confirmation that the wells can no longer be used. Mr. Wasserman confirmed the pumps were removed and slurry poured into the wells so they cannot be used in the future.

Ms. Albowicz asked for confirmation that these homes had been receiving bottled water and will now be paying for water. Mr. Wasserman confirmed these homes had been receiving bottled water. Mr. Rudy asked if there were any other homes receiving bottled water, and Mr. Gortva said there were no other homes receiving bottled water.

Ms. Hahn asked for an update on the road proposed to go through Area B. Mr. Gortva said there were no new developments. Mr. Craig stated the Army does not know the County's timetable, and the County has not yet approached the Army or the regulators to present their proposed plan. Ms. Hahn asked if the concern expressed at a previous meeting about the impact on the caps from vibrations if the road is constructed would be addressed, and Mr. Thomson responded that vibration analysis would have to be examined. Mr. Rudy asked if there would be a public meeting, and Mr. Craig said the public can request a public meeting through the NEPA process.

Mr. Gortva said as soon as information is available, the Army will communicate with the Board members.

9. RAB Member Open Discussion and General Community Comments

Mr. Gortva invited open discussion from the RAB members.

Mr. Rudy asked about emissions at Fort Detrick since the topic has not been discussed at Board meetings. Mr. Craig responded that only projects funded by the Army's Environmental Restoration Program can be discussed at Board meetings. He stated the Environmental Restoration Program looks at events prior to about 1984 (Ms. Green later provided the correct date of 1986) and whether there are any impacts from those events. Mr. Craig said there are many environmental laws after that date which regulate emissions and incinerators such as the Resource Conservation and Recovery Act (RCRA) and the Clean Air Act which the Army also complies with at its bases. Mr. Gortva reiterated Mr. Craig's explanation and concurred that other programs are outside the charter of the Restoration Program and the Board. Dr. Pauly discussed the work he performs at a laboratory on-post and stated the staff go to great lengths to contain emissions and comply with environmental regulations. Dr. Pauly concurred that is not part of the Board's charter to discuss these types of issues at the Board meetings.

Mr. Gortva invited comments for the community members in the audience; none were offered.

10. Future Meeting Dates

Mr. Gortva said proposed future meeting dates are July 11, 2017, (changed from July12) November 8, 2017 and March 7, 2018. Mr. Gortva said all the dates are tentative until the room is booked.

Mr. Gortva invited Board members to let him know about topics of interest for future meetings. Mr. Rudy requested the City be invited to give an update on the road project.

The meeting adjourned at approximately 8:26 p.m.

Reviewed by:

Approved/Disapproved

Enclosures:
Area B Site Inspection Report Update
Area B Groundwater Remedial Investigation Status
Area B Groundwater Monitoring Well Network
Kemp Lane Connections Update
Meeting Sign-In Sheet

DISTRIBUTION:

Each RAB Member (w/o enclosure)
Each Meeting Attendee (w/o enclosure)

PIKA

ARCADIS

a joint venture

ENVIRONMENTAL RESTORATION SERVICES FORT DETRICK, FREDERICK MD

Progress Report for the RAB

March 08, 2017

John Cherry
Arcadis

Overview of Topics

- Site Inspections (SI) Status –Area B
- Area B Groundwater Remedial Investigation (RI) Status

PIKA

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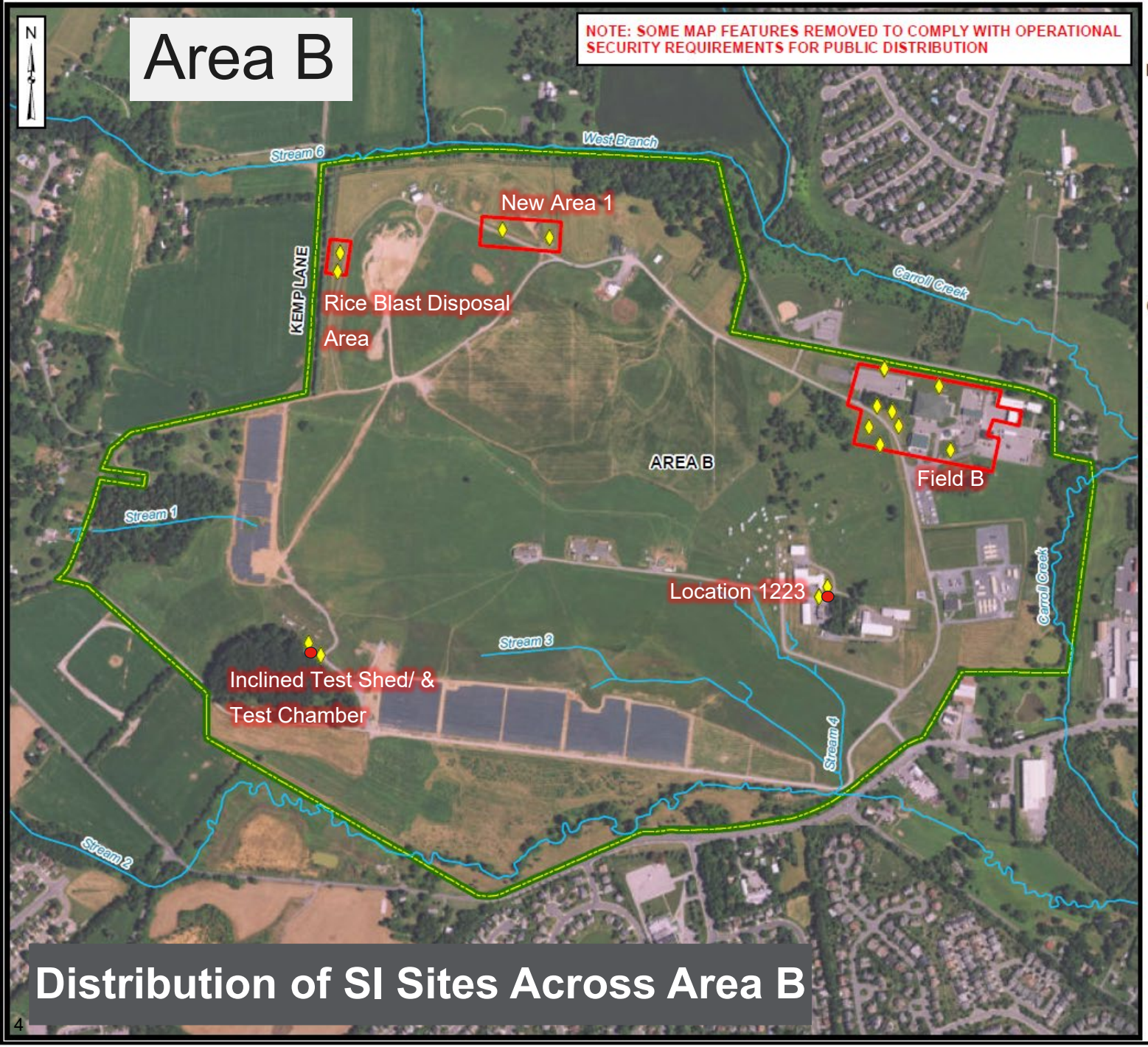
SITE INSPECTION (SI) STATUS – AREA B



Distribution of SI Sites Across Area B

Environmental Restoration Services to Conduct Fort Detrick Site Inspections of New Archive Search Report Sites

Fort Detrick
Frederick, MD

PIKA ARCADIS

Sample Locations Completed as of Aug. 2016

Legend

- Installation Boundary
- Site Boundary
- Site Location (Point)
- Stream
- Completed Soil Sample Location

Data Source: ESRI, ArcGIS Online, Aerial Imagery, 2013

Coordinate System: Maryland State Plane
Datum: NAD 1983
Units: Feet

Date: August 2016

Area B Former Herbicide Test Sites: New Area 1 and Field B

Background

- In the 1940s and 19502 controlled field experiments were conducted on small plots using two primary herbicide groups:
  1. Hologentated phenoxy acetic acid herbicides, including 2,4,5-T (2,4,5-trichlorophenoxyacetic acid)
  2. Arsenical herbicides

SI Investigation

- Surface (0-2 ft) and subsurface (2-4 ft) soil samples collected from both areas.
- Soil analyzed for metals (arsenic) and dioxins

Area B Group Former Herbicide Test Sites: New Area 1 and Field B

SI Results and Recommendations

- The dioxin, TCDD, was not detected in the 20 surface and subsurface soil samples collected across New Area 1 and Field B.
- Arsenic and dioxin detections were evaluated in comparison to background levels for western MD, EPA regional screening levels for residential soil, and ecological soil screening levels.

Why test for Dioxins?

Dioxin (specifically TCDD) is known to be a contaminant from the manufacture of 2,4,5-T, which is an acetic herbicide used in the formulation of Agent Orange. Dioxins are also persistent in the environment so testing for dioxin many decades after potential application provides a way to assess whether 2,4,5-T was used during the experiments in the 1940s and 1950s.

- Arsenic and dioxin detections do not pose significant risks or hazards to potential human or ecological exposures.
- The SI report will recommend No Further Action to EPA and MDE for these sites.

Area B Disposal, Storage, or Other Sites: Rice Blast Disposal Area

Background

- In 1973, inert ash residue was spread in a 0.57 acre area of Area B. The ash residue resulted from the incineration of inactivated spores used in the formulation of an anti-crop agent called Rice Blast.
- Prior to spreading and tilling the ash into the soil, laboratory analysis of the ash had confirmed it was free of any biological or chemical elements.

SI Investigation Results and Recommendations

- Surface (0-2 ft) soil samples were collected and analyzed for dioxins to test for impacts from spreading incinerated ash material.
- Dioxin detections do not pose significant risks or hazards to potential human or ecological exposures.
- The SI report will recommend No Further Action to EPA and MDE for the Rice Blast Disposal Area.

Area B Disposal, Storage, or Other Sites: Inclined Test Shed & Test Chamber

Background

- Two temporary buildings located at the firing bunker for the demolition pit were identified on 1966 site plans. A 1975 building list identifies their uses as described above, but no other details concerning these buildings are known.

SI Investigation Results and Recommendations

- Based on the building use descriptions, surface (0-2 ft) and subsurface (2-4 ft) soil was analyzed for munition constituent metals (lead, copper, zinc, and antimony), SVOCs, and explosives.
- All metals and SVOC detections were below residential comparison criteria. No explosives were detected.
- The SI report will recommend No Further Action to EPA and MDE for the Inclined Test Shed and Test Chamber area.

Area B Disposal, Storage, or Other Sites: Former Solvent & Flammable Storage Area (1223)

Background

- Records indicate this former storage building was used for flammable storage (1953) and paint storage (1956 and 1975) before being razed by 1979.

SI Investigation Results and Recommendations

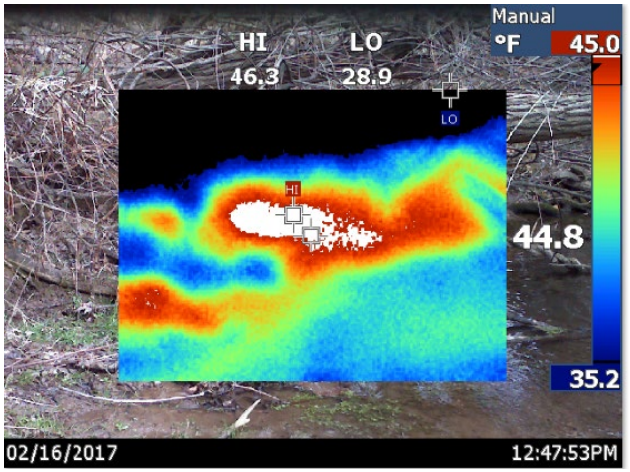
- Surface (0-2 ft) and subsurface (2-4 ft) soil was analyzed for volatile organic compounds (VOCs) based on the prior storage of flammable materials and paints.
- VOCs were not detected above USEPA regional screening levels.
- The SI report will recommend No Further Action to EPA and MDE for the Former Solvent & Flammable Storage Area.

Next SI Steps:

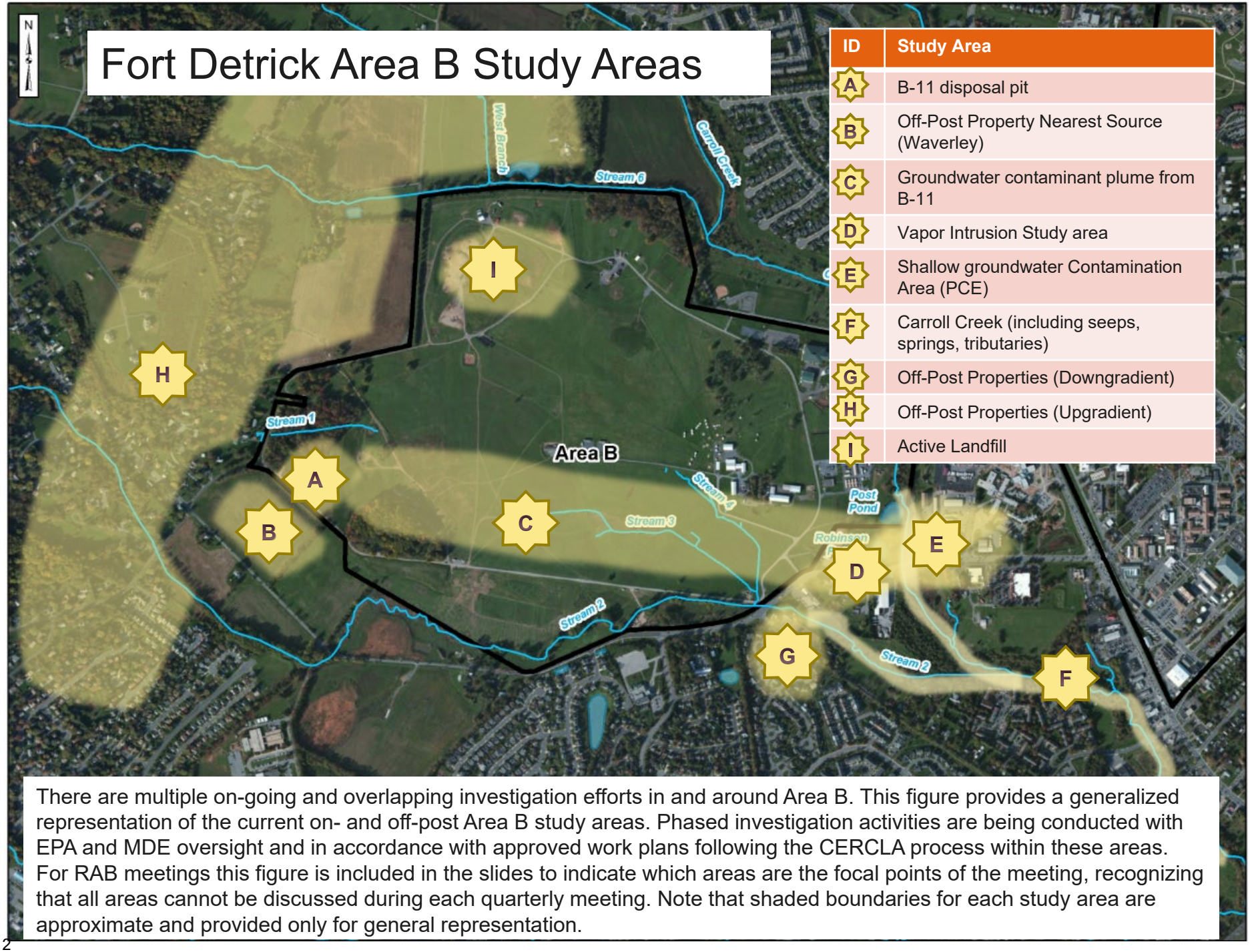
- The SI report for Area B will be submitted for regulatory review in Spring 2017.
- The Army will make recommendations to EPA and MDE for whether future investigations are warranted.

All SI site recommendations will be subject to review and concurrence by EPA and MDE

AREA B GROUNDWATER REMEDIAL INVESTIGATION STATUS



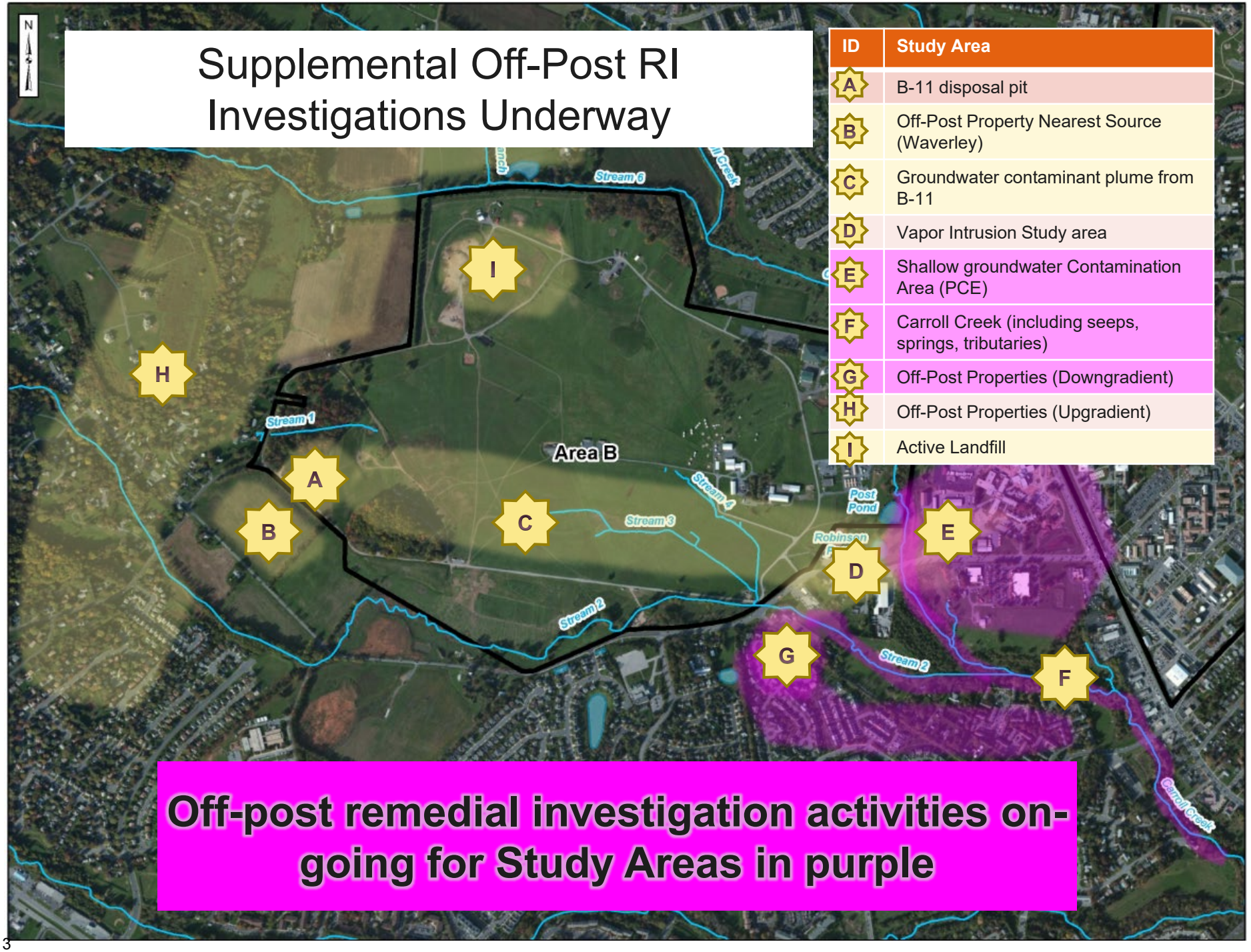
Fort Detrick Area B Study Areas



ID	Study Area
A	B-11 disposal pit
B	Off-Post Property Nearest Source (Waverley)
C	Groundwater contaminant plume from B-11
D	Vapor Intrusion Study area
E	Shallow groundwater Contamination Area (PCE)
F	Carroll Creek (including seeps, springs, tributaries)
G	Off-Post Properties (Downgradient)
H	Off-Post Properties (Upgradient)
I	Active Landfill

There are multiple on-going and overlapping investigation efforts in and around Area B. This figure provides a generalized representation of the current on- and off-post Area B study areas. Phased investigation activities are being conducted with EPA and MDE oversight and in accordance with approved work plans following the CERCLA process within these areas. For RAB meetings this figure is included in the slides to indicate which areas are the focal points of the meeting, recognizing that all areas cannot be discussed during each quarterly meeting. Note that shaded boundaries for each study area are approximate and provided only for general representation.

Supplemental Off-Post RI Investigations Underway



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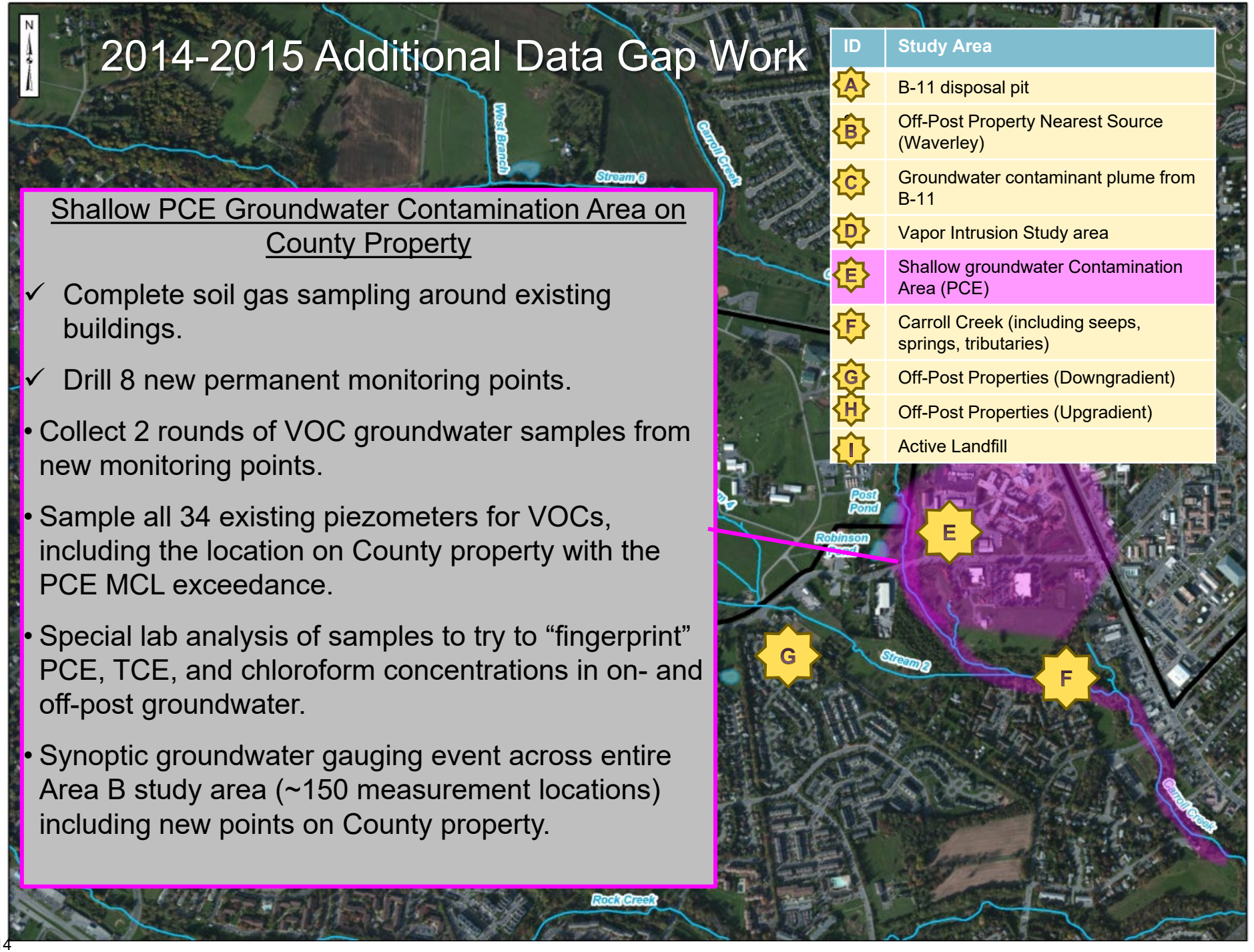
Off-post remedial investigation activities on-going for Study Areas in purple

2014-2015 Additional Data Gap Work



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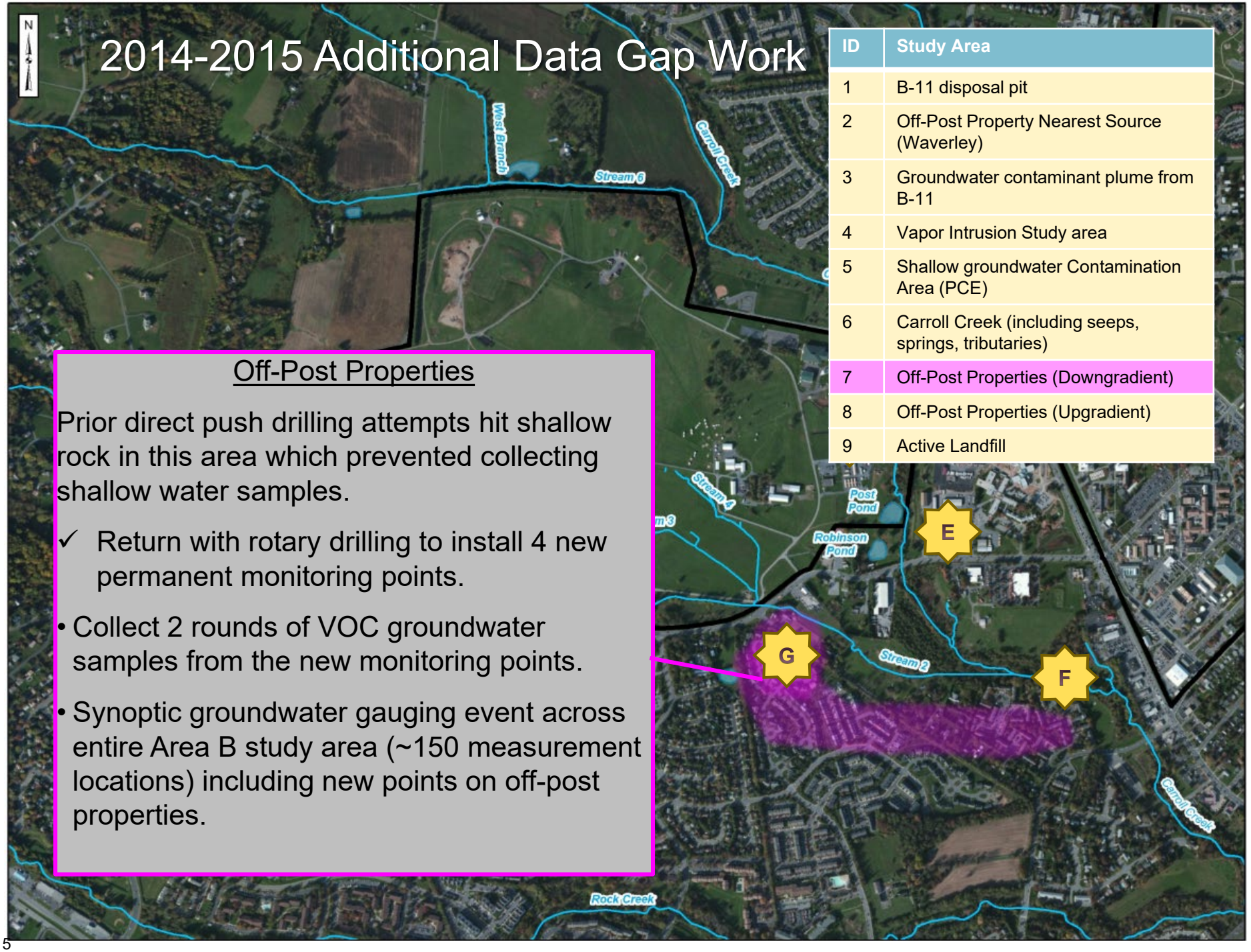
Shallow PCE Groundwater Contamination Area on County Property

- ✓ Complete soil gas sampling around existing buildings.
- ✓ Drill 8 new permanent monitoring points.
- Collect 2 rounds of VOC groundwater samples from new monitoring points.
- Sample all 34 existing piezometers for VOCs, including the location on County property with the PCE MCL exceedance.
- Special lab analysis of samples to try to “fingerprint” PCE, TCE, and chloroform concentrations in on- and off-post groundwater.
- Synoptic groundwater gauging event across entire Area B study area (~150 measurement locations) including new points on County property.

2014-2015 Additional Data Gap Work



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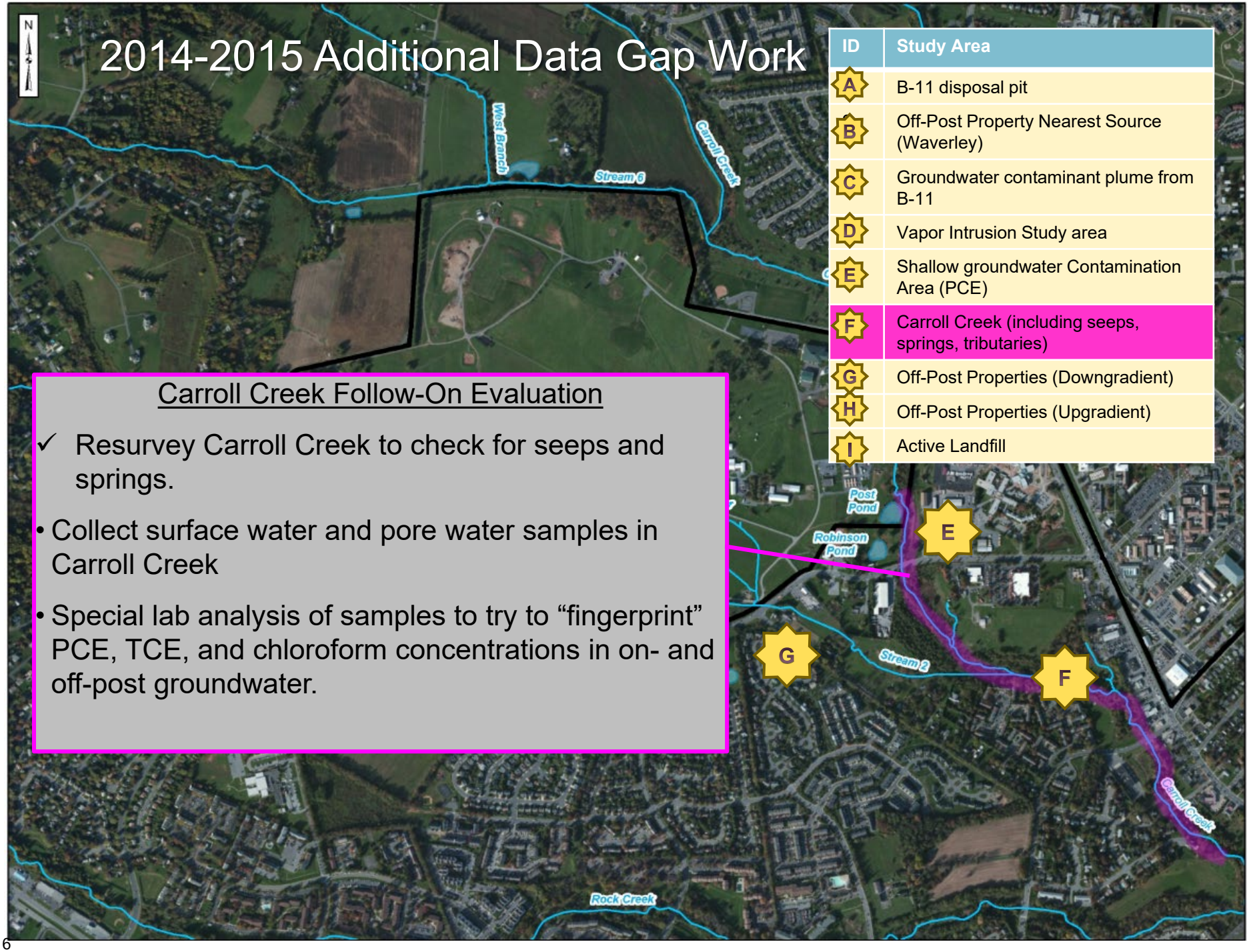
Off-Post Properties

Prior direct push drilling attempts hit shallow rock in this area which prevented collecting shallow water samples.

- ✓ Return with rotary drilling to install 4 new permanent monitoring points.
- Collect 2 rounds of VOC groundwater samples from the new monitoring points.
- Synoptic groundwater gauging event across entire Area B study area (~150 measurement locations) including new points on off-post properties.

2014-2015 Additional Data Gap Work



ID	Study Area
A	B-11 disposal pit
B	Off-Post Property Nearest Source (Waverley)
C	Groundwater contaminant plume from B-11
D	Vapor Intrusion Study area
E	Shallow groundwater Contamination Area (PCE)
F	Carroll Creek (including seeps, springs, tributaries)
G	Off-Post Properties (Downgradient)
H	Off-Post Properties (Upgradient)
I	Active Landfill

Carroll Creek Follow-On Evaluation

- ✓ Resurvey Carroll Creek to check for seeps and springs.
- Collect surface water and pore water samples in Carroll Creek
- Special lab analysis of samples to try to "fingerprint" PCE, TCE, and chloroform concentrations in on- and off-post groundwater.

Infrared Stream Survey

- Survey of Carroll Creek completed in February using handheld infrared device.
- Effectively confirmed locations where groundwater enters Carroll Creek via seeps and springs.
- Sampling planned for later in March.

Next RI Steps:

- The supplemental off-post RI work will continue into April 2017.
- Currently it is not anticipated that further RI work will be recommended to EPA and MDE, but this is subject to concurrence by the regulatory agencies.
- A comprehensive CERCLA RI report detailing all Area B investigation activities and analytical results collected to date will be prepared and submitted in Summer/Fall 2017.
- RI report will include human health risk evaluation.
- RI report will support evaluation of potential remedial alternatives in a future Feasibility Study document.
- Army is also in discussions with EPA and MDE about a potential pilot study to assess remedial options.

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Joint Venture (JV) between:

Watermark Environmental, and

Environmental Chemical Corporation (ECC)

Contract No. W912DR-12-D-0005, Task Orders 003

US Army Corp of Engineers (USACE) – Baltimore District

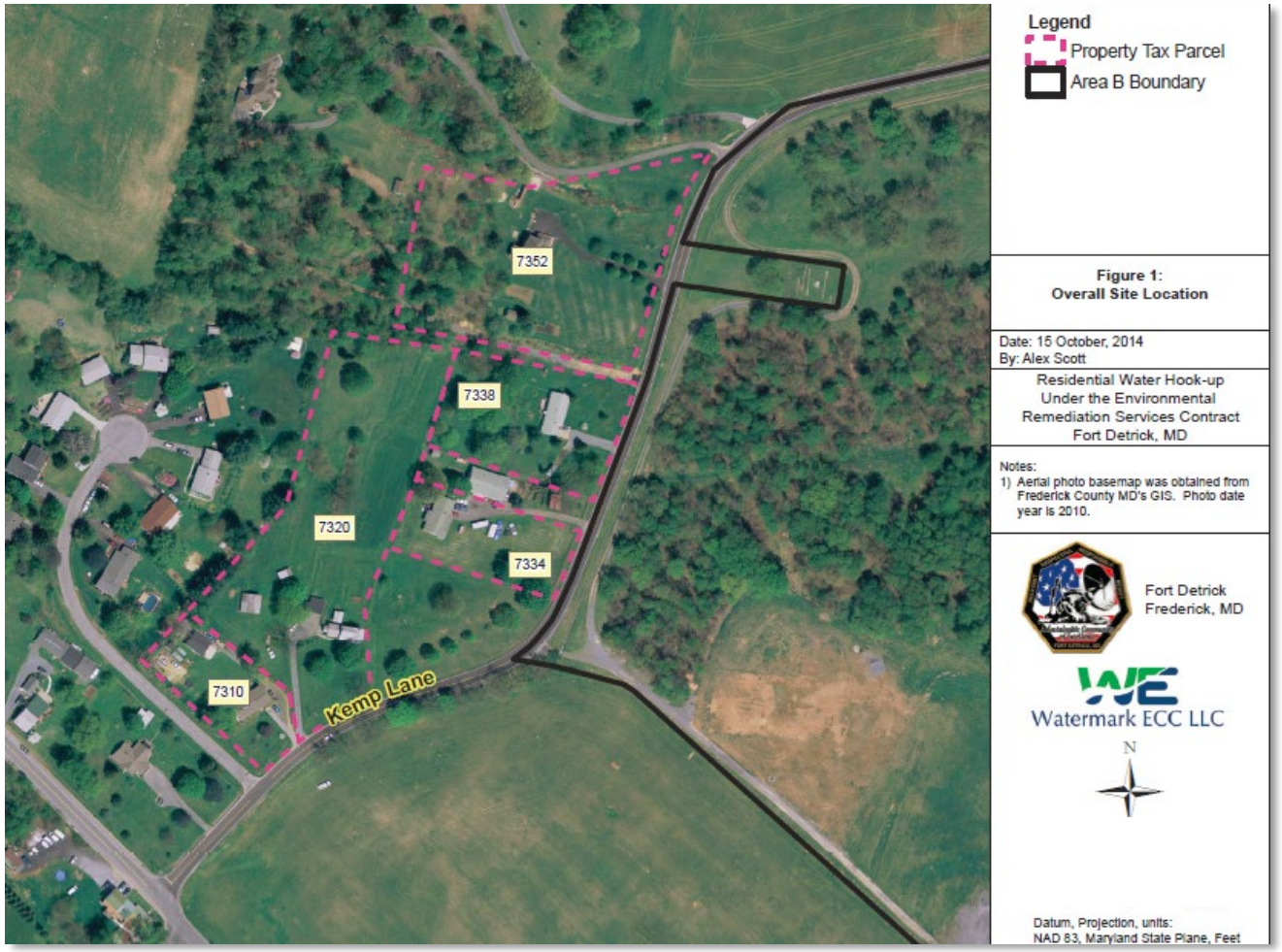
Presenter:

Robert Wasserman, P.G.

Deputy Program Manager

Potable Water Connections and Private Well Abandonment - Kemp Lane

- Field activities commenced on 27 January 2017 and were completed on 14 February 2017
- Time-Critical Removal Action at 5 Properties:
  - 7310 Kemp Lane
  - 7320 Kemp Lane
  - 7334 Kemp Lane
  - 7338 Kemp Lane
  - 7352 Kemp Lane
- Included connections from the water main underlying Kemp Lane to individual properties, and abandonment of the private production wells at each property.



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Potable Water Connections and Private Well Abandonment - Kemp Lane

- Timeline of Field Activities:
  - 29 December 2016: City of Frederick issues water service permits
  - 13 January 2017: County and City request additional permits for traffic control and road cuts; bonding.
  - 26 January 2017: County and City road crossing permits issued; preconstruction meeting with the City.
  - 27 January 2017: Commence potable water connections.
  - 31 January 2017: In-service test with City Inspector completed at 7310 and 7320 Kemp Lane
  - 2 February 2017: In-service test with City Inspector completed at 7334 and 7338 Kemp Lane. Residential plumbing permits issued for all properties.
  - 3 February 2017: In-service test with City Inspector completed at 7352 Kemp Lane. Temporary concrete patches for Kemp Lane completed.

Kemp Lane road cut and exposed water main.

Water main saddle and service tap.

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Potable Water Connections and Private Well Abandonment - Kemp Lane

- Field Activities (continued):
  - 7 February 2017: Commence directional drilling and pipe installation (from the meter to each residence) for individual water lines.
  - 8 February 2017: Water lines inspected and tested by City Plumbing Inspector at 7310 and 7320 Kemp Lane. Lines put into service.
  - 9 February 2017: Water lines inspected and tested by City Plumbing Inspector at 7334, 7338, and 7352 Kemp Lane. Lines put into service.
  - 14 February 2017: Completed well abandonment and initial site restoration activities.
- Activities Remaining:
  - Final site restoration
  - Final milling and paving at Kemp Lane
  - Post-Activity Summary Report

Water meter trench and associated housing.

Example of a Directional Boring Drill Rig

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Fort Detrick Area B
Status Update
Landfill Cap
Monitoring Network Expansion

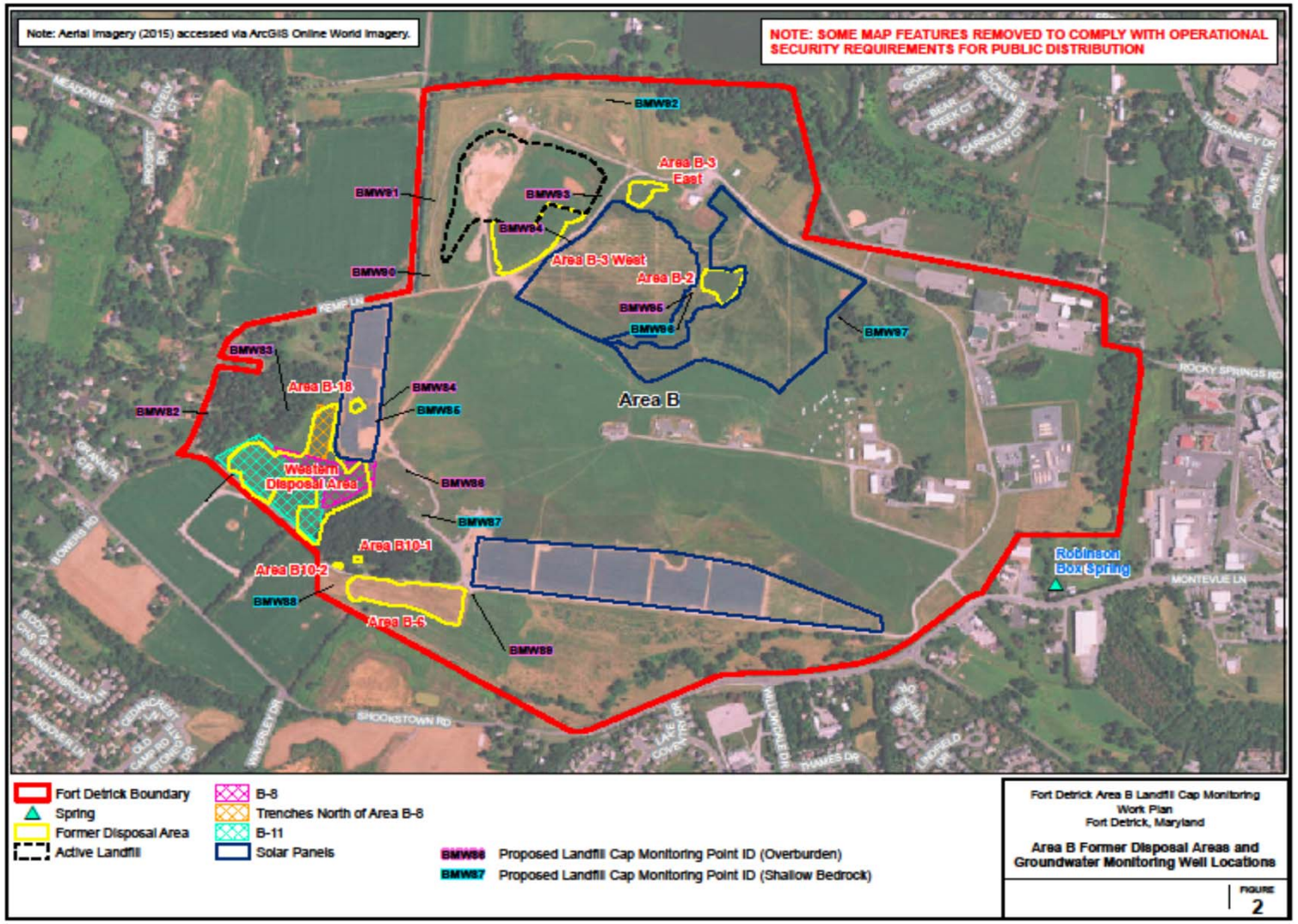
U.S. Army Corps of Engineers

November 8, 2017

Scope of Work

- Install 16 new monitoring wells to expand the existing monitoring network surrounding the capped landfills.
- Properly abandon and replace 5 consistently dry monitoring wells.
- Install a pair of lysimeters at each capped landfill (6 pair total).

New Well Locations



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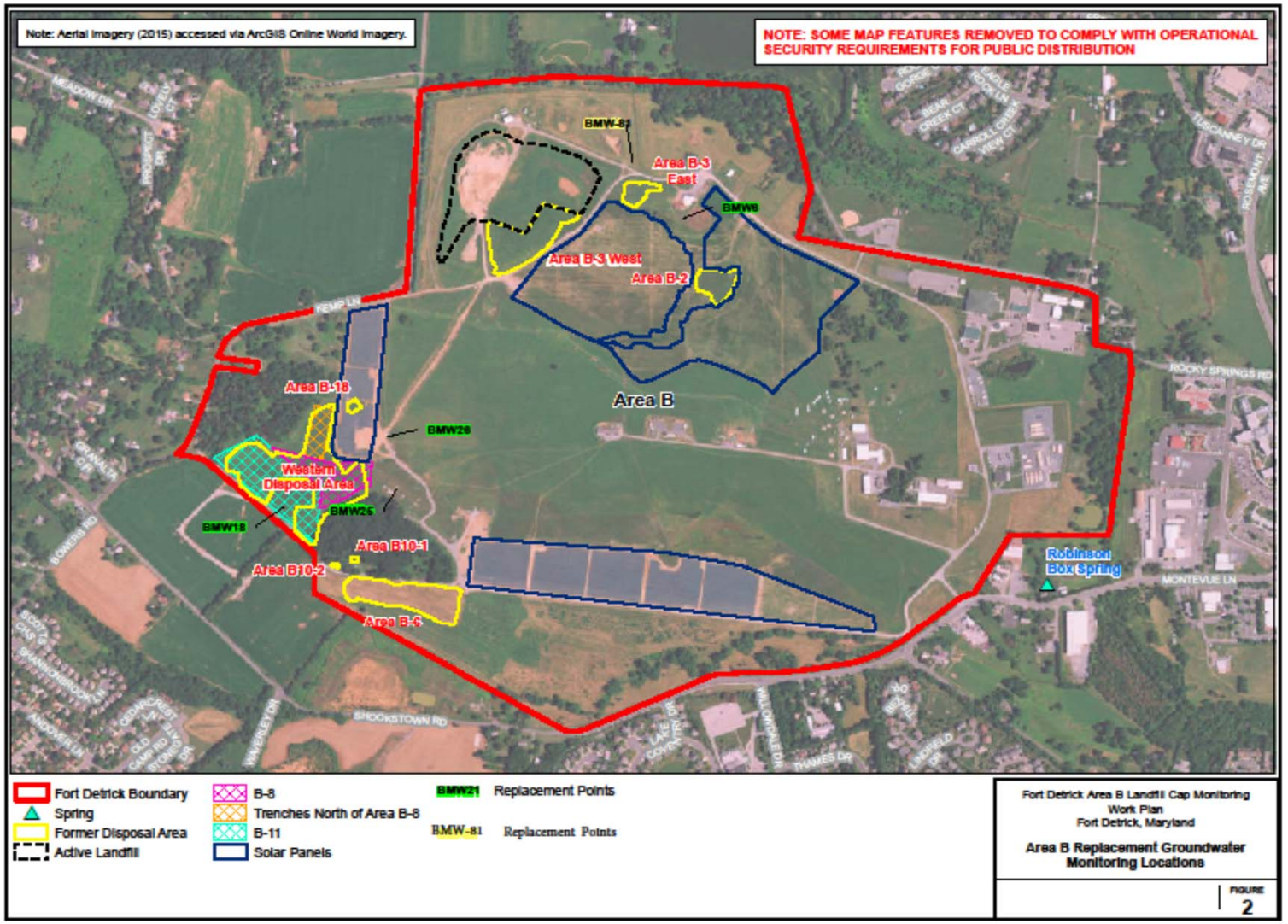
Status of 16 New Wells

- Six of the 16 wells have been completed to date. Completed wells include BMW84, BMW85, BMW87, BMW88, BMW92 and BMW97.
- Well depths ranged from 45 feet (ft) to 61 ft. All wells were completed in limestone bedrock with 15 ft of screen.
- Numerous voids were encountered in each borehole. Voids ranged from a 1 ft to 6 ft cavities.

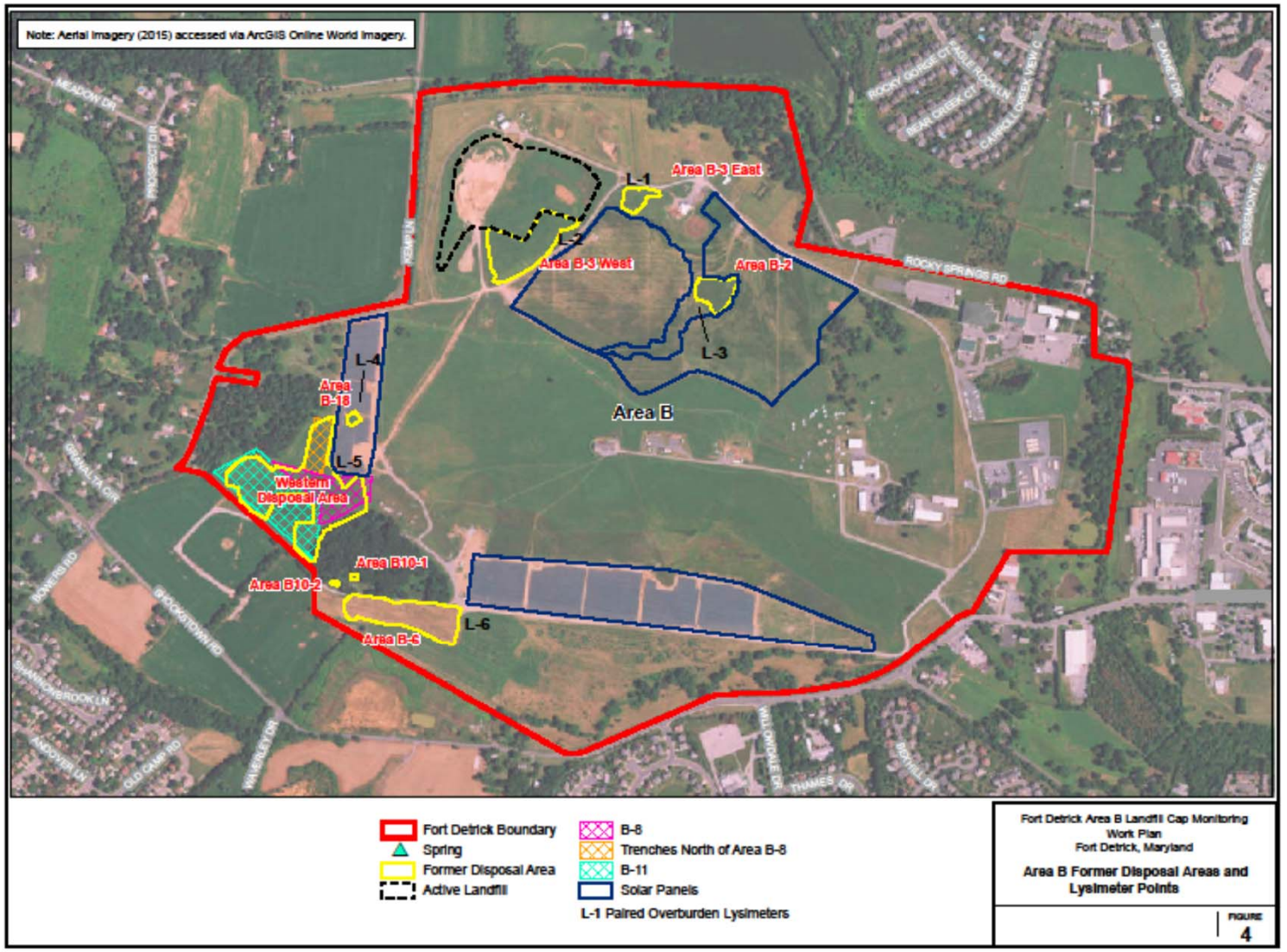
Replacement Well Locations



Status of Replacement Wells

- Five, consistently dry, wells have been properly abandoned (grouted and sealed).
- Installation of the 5 replacement wells is complete (BMW6R, BMW18R, BMW25R, BMW26R and BMW81R).
- Wells ranged from 45 ft to 90 ft in depth. All wells were completed in limestone bedrock with 15ft of screen, except for BMW18R (10ft screen).
- Numerous voids were encountered in each borehole. Voids ranged from a 1 ft to 16 ft cavities.

Lysimeter Locations



Status of Lysimeters

- The installation of 6 pair of lysimeters is scheduled to begin this week.

USACE Drilling Setup

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USACE Drilling New Well

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USACE
Drilling
New Well

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Schedule

- The remaining 10 well installations are projected to be complete by 22 December 2017.
- A 2nd USACE drill crew was mobilized this week (6 Nov) to the start the Installation of Lysimeter Wells. Lysimeter installation is projected to be complete by 15 December 2017.