IMFD–PWE 05 February 2015

MEMORANDUM FOR RECORD

SUBJECT: Fort Detrick Restoration Advisory Board (RAB) Meeting Summary,
05 NOVEMBER 2014

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:
Mr. Robert Craig, Fort Detrick, Acting Co-Chair
Dr. Gary Pauly, Community RAB Member, Co-Chair
Mr. Rolan Clark, Community RAB Member
Mr. Joseph Gortva, Environmental Restoration Program Manager
Dr. Elisabeth Green, Maryland Department of the Environment
Ms. Jennifer Hahn, Community RAB Member
Mr. Cliff Harbaugh, Community RAB Member
Ms. Karen Harbaugh, Community RAB Member
Mr. George Rudy, Community RAB Member
Mr. Robert Thomson, U.S. Environmental Protection Agency

Others Present:
Mr. Larry Brown, US EPA Public Affairs
Mr. John Buck, US Army Corps of Engineers
Mr. Gareth Buckland, Fort Detrick Environmental Office
Mr. Gary Zolyak, Fort Detrick Office of the Staff Judge Advocate
Mr. Keith Hoddinott, US Army Public Health Command
Mr. Bill Krantz, community member
Mr. Ed Krantz, community member
Mr. Pat Lowman, community member
Mr. Barry Glotfelty, Frederick County
Mr. Chris Donourst, Rocky Gorge Development
Mr. Randy McClement, City of Frederick
Ms. Nikki Bamonti, City of Frederick
Ms. Kelly Russell, City of Frederick
Mr. John Cherry, ARCADIS
Ms. Shelly Morris, ARCADIS
Ms. Katrina Harris, Bridge Consulting Corp.

Members Absent:
Mr. Eli DePaula, Community RAB Member
Dr. Henry Erbes, Community RAB Member
Ms. Alicia Evangelista, Frederick County Health Department
Ms. Laurie Haines-Eklund, Army Environmental Command
Mr. Barry Kissin, Community RAB Member

3. Meeting Opening / Remarks

Mr. Robert Craig called the meeting to order. He thanked everyone for attending and welcomed everyone to the meeting. He introduced himself as the Environmental Compliance Chief for the Garrison and stated that he would be acting Army co-chair for this meeting. Dr. Gary Pauly introduced himself as the community co-chair and welcomed everyone.

Dr. Pauly invited the Board and audience members to introduce themselves.

4. Purpose of RAB Meetings presented by Dr. Gary Pauly, Board Community Co-Chair

Dr. Pauly reviewed the purpose of the Restoration Advisory Board, noting it is a panel of interested parties and participants put together by a Department of Defense facility when there are significant environmental restoration projects. He stated that the purpose is to serve as a venue to communicate with the public on how the restoration process is proceeding, how the sites are being investigated, and how the remedies are executed. Dr. Pauly said that is why the Board exists. He noted that the Board is composed of representatives of the Army, the U.S. Environmental Protection Agency, the Maryland Department of the Environment, and community members.

Mr. Craig said that the Board's ground rules for meetings have been reviewed at the start of each meeting for the last couple years, and the preference for tonight is to not review them again but to get down to business. He asked that all present to keep in mind the focus of the Board needs to be limited to the environmental restoration program. Dr. Pauly asked that questions be limited until the end of each presentation. He added that there will be an opportunity for public comment at the end of the presentations and requested questions be held until then as the presenters have much material to cover.

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

Mr. Gortva noted that the minutes from the August 6 meeting had been distributed to the Board members for review, and no comments had been received. He asked for any comments. Ms. Jennifer Hahn referred to a statement made by Mr. Cherry on page 9: "He said that the concentrations exceeding the drinking water standard are in same direction of groundwater flow towards the east and carrying contamination toward Carroll Creek." She said that there is contamination not flowing east with the groundwater so the statement is not correct. Mr. Gortva said that he would review the statement. Mr. Gortva said that there is a minor groundwater loop that extends to the south, less than 100 feet onto another property, and then continues to flow east. Ms. Hahn noted that this clarification is important for elected officials who may be reading the minutes and making decisions based on information in the minutes. Ms. Hahn asked if the workplan for the Site Investigation referred to on page 19 had been distributed to the Board. Mr. Gortva said that the document would be distributed soon.

6. RAB Presentation Improvements and Operating Procedures presented by Mr. Joseph Gortva, Fort Detrick

Mr. Craig said that a number of comments were made at the last meeting regarding presentations and information presented at the Board meetings. He noted that the presentations have tended to be very targeted and just present what the contractor is currently working on and not encompass the bigger picture or reiterate previous work or findings. He said that the community's comments were heard, and that the Army has put much effort into revising the format for presentations and how material is presented. He asked Mr. Gortva to provide additional detail.

Mr. Gortva reiterated that the Army had heard the comments made at the previous meeting about presentations being too long and results not given upfront. He said that the Army and its

contractors have been working on how to present information so it relates to the big picture and is packaged in a format that people not present at the meeting can easily understand, or that want information that is easily correlated to a particular area and the related impacts, or how one area may or may not relate to other areas.

Mr. Gortva said that a new presentation format would be introduced tonight that would include a 360° overview slide with all of the areas of studies or investigation on a map. He continued explaining that areas would be identified with a letter and information provided on these areas. He said that the information would be put together in a binder for the Board and made available to the public through the web site.

Mr. Gortva said that fact sheets are being prepared for distribution to the Board and the public. He said that he would like input from the Board on what topics the fact sheets should cover. He listed some initial topics as the Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA) cleanup process, Area B Environmental History and Former Actions, Risk Assessments, Drilling and Investigation Activities, and Media-Specific Investigation Summaries. He encouraged Board members to suggest additional topics.

Mr. Gortva said that Board members are also encouraged to provide topics at the end of the meeting for the next meeting or meetings in the future. He said that a running list of topics would be maintained.

Mr. Gortva next discussed the Board's operating procedures. He stated that they were originally known as a charter and needed to be updated. He said that the Board at Forest Glen had used operating procedures developed at Fort Monmouth to develop their own. Mr. Gortva suggested that a special administrative meeting of the Board be held to develop the operating procedures, noting such a meeting did not have to be advertised or open to the public. Several Board members indicated a preference for a separate administrative meeting. Mr. Gortva suggested that such a meeting be held on-post and said he would send out potential dates for early 2015. Mr. Rudy asked if comments should be submitted in advance or brought to the meeting. Mr. Craig said that at Forest Glen the sample operating procedures were reviewed paragraph by paragraph and changes made at the meeting. Mr. Craig said that comments in advance would be welcome, and Dr. Pauly encouraged that comments on particular areas of concern might be helpful to submit to the group in advance.

7. Area B Groundwater Investigation Update presented by Mr. John Cherry, ARCADIS

Mr. John Cherry stated that he would be following the revised concept for presentations discussed by Mr. Gortva. He reviewed the topics that he would be covering starting with an overview of Area B and a snapshot summary of new results since the last Board meeting. He said that he also would be discussing the deep drilling on-post and off-post, new groundwater sampling results at the Waverley property, future remedial investigation activities, the upcoming schedule, and the next steps.

Mr. Cherry displayed the Area B Conceptual Site Model and reviewed the key aspects. He stated that B-11 is the principal source area, where there is residual contamination present in the

sub-surface groundwater with concentrations moving towards the south/southwest onto a portion of the Waverley property [and then back onto Fort Detrick and travels east leaving Area B] then discharges into Carroll Creek.

Mr. Cherry displayed an aerial photograph of the Area B Study Area and advised that the Study Area had been divided into nine areas labeled A through I. He advised that only certain of these areas and investigations may be discussed at a particular Board meeting, but this map will help remind everyone there are a number of phased investigation activities occurring throughout the Study Area. Mr. Cherry said that there would be one-page summaries of each area developed that discuss the nature of impacts in that area and some of the possible risks and uncertainties; he noted that there was an example at the end of this presentation of such a summary. Mr. Cherry displayed a similar aerial photograph with the focus areas for his presentation highlighted.

Mr. Gortva added that there had been discussion as to whether numbers or letters should be used, and that the Army did not want numbers to convey the impression of a ranking of more serious or higher priority. He said that the areas were not labeled with a particular letter for any specific reason.

Mr. Cherry next gave a Snapshot Update on activities since the last Board meeting. He stated that he would be presenting analytical data on shallow groundwater sampling on the Waverley property, and that the data shows some exceedances of the maximum contaminant level. Mr. Cherry said that he would also be discussing the preliminary screening level data from Packer test results from off-post deep borings on the Waverley property which show some exceedances of the maximum contaminant level along the property line but not further south. He stated that the work is being done in close collaboration with the US EPA and Maryland Department of the Environment, and that there had been six decision-making teleconferences over the last couple weeks. He noted that data is reviewed during these calls, and agreement is reached on decisions such as monitoring well specifications. He advised that there had also been a meeting at US EPA in Philadelphia earlier in the month.

Mr. Cherry next gave an update on the deep drilling. He displayed an aerial photograph showing three areas marked with red stars and discussed the reasons why deep drilling was being conducted in these three areas. He also showed a recap of the deep drilling work. He advised that deep drilling was being conducted near the B-11 former disposal pit as it is a known source for tetrachloroethe (PCE) and trichloroethene (TCE) in the groundwater, and while there are many wells across Area B at various depths, there are some uncertainties about how deep the contamination extends and thus a data gap exists. He said that the deep well at this location would be from 400 to 500 feet below ground surface. Mr. Cherry advised that a second location is at the toe of the groundwater plume on the other side of Carroll Creek. He explained that this well would help answer the question of whether any contamination is flowing under Carroll Creek. Mr. Cherry said that four boring locations on the Waverley property had been completed. He referenced the depths shown on the slide and noted preliminary screening data was available for the wells on the Waverley property.

Mr. Cherry pointed out a reference on the aerial photograph which listed past presentations which had additional information on the topic.

Mr. Cherry next discussed the new shallow and deep groundwater data. He explained that when the boreholes are drilled, optical images are obtained along with geophysical data. He said that fractures can be identified in the borehole wall and decision made about where it might be effective to conduct Packer testing and eventually screen for long-term groundwater sampling. Mr. Gortva added that as the boreholes are drilled, material can fall into the hole and that has happened with some of the drilling locations in the past.

Ms. Hahn asked if there is any impact on the contamination when a well collapses. Mr. Cherry responded that there is not. He said that much investigative derived waste, water, silt and sediment is generated during drilling and sometimes the borehole becomes unstable and fills in with sediment. He noted that this is a very localized incident and does not create long-term sinkage or pull. Ms. Hahn asked about any change in the geology from the drilling or collapse, and Mr. Cherry responded that there could be a slight short-term change, but there is no impact on the overall regional groundwater flow.

Mr. Cherry said that on the Waverley property shallow wells were installed to sample "first water" which was typically encountered at 27 to 53 feet below ground surface. He advised that these locations are marked by a red circle on the aerial photograph. Mr. Cherry advised that the deeper wells were installed down to about 400 feet below ground surface and were marked by purple circles on the aerial photograph.

Mr. Cherry displayed the results from the new shallow groundwater wells that were sampled on the Waverley property; he stated that TCE and PCE were detected above the drinking water standard of 5 parts per billion. He said that TCE was detected in four locations and PCE was detected in one location above the drinking water standard. He noted that there are detections of TCE and PCE on Fort Detrick across from these wells so the detections are not unexpected. He pointed to a second line of wells where there were no detections exceeding the drinking water standards.

Mr. Cherry explained that water levels had been collected from the wells and the data used to develop groundwater flow direction contours. He said that the data shows the groundwater flow is consistent with the regional flow direction and flows to the east/southeast, crossing onto the Waverley property and then back onto Fort Detrick. Mr. Gortva added that the highest detection in the new shallow wells on the Waverley property was 61 parts per billion of TCE directly across from the well on Fort Detrick where levels of 17,000 parts per billion of TCE has been detected. He said that the TCE crosses the property boundary but at significantly lower concentrations, moves along the fence line, and then comes back onto Fort Detrick property. Mr. Cherry reminded the Board that no one was drinking the contaminated groundwater.

Ms. Hahn asked if there are seeps or streams where children might play and be exposed to the contamination. [On the Waverley, there are no seeps or springs in the area of the TCE and PCE detections] Mr. Cherry said that there have been detections in Carroll Creek. Ms. Hahn asked if vapor intrusion is an issue. Mr. Gortva said that if there were homes within 100 feet of a

groundwater plume with detections of [TCE or PCE] greater than 5 parts per billion then testing should be conducted. He said that it did not mean there was a [vapor intrusion] issue, just that testing should be done. Mr. Gortva said that if there were no detections in excess of the 5 parts per billion standard there would be no potential for a vapor intrusion issue.

Mr. Cherry said that at the last meeting he had talked in general terms about the shallow sampling results from the July and August 2014 sampling of wells on the Waverley property. He said that the information had now been plotted on an aerial photograph of the area which he displayed. He noted that the concentrations are shown in parts per billion, and a notation of less than 1 is the limit of the detection equipment. He advised that the locations where detections had exceeded the drinking water limit were highlighted in red. He added that the Army has recommended four of the locations become permanent monitoring wells, pending Rights of Entry agreements, to enable the Army to continue to monitor the groundwater in the future.

Mr. Cherry summarized the results by saying that they confirmed there are drinking water exceedances on the Waverley side of the fence. He said that this was not a surprise given the high levels on the Fort Detrick side near B-11, but the levels are now known. He reiterated that no one is drinking the contaminated groundwater. Mr. Cherry said that these detections in the shallow groundwater would present a potential for vapor intrusion if there were homes built within 100 feet of the detections. He said that it does not mean a risk exists, just that it would be prudent to do some sampling. He said that there is no current use of the groundwater on the Waverley property and that there was no future use as Maryland Department of the Environment had imposed restrictions on the use of the groundwater.

Mr. Cherry said that due to the depth of the groundwater contamination there is no risk to plants or corn planted on the property. Ms. Hahn asked if the shallow groundwater could pose a vapor intrusion issue, why is it less dangerous to plants. Mr. Cherry responded that the roots of the plant would not be at the depth of the groundwater which is down 27 to 50 feet. He noted that plants that have roots that extend into the groundwater and can be used as a phytoremediation technology to clean up groundwater but that is not the case here. Mr. Rudy mentioned articles which showed uptake in trees in the Northwest. Ms. Green from the Maryland Department of the Environment added that vapor intrusion occurs when there is an enclosed structure over groundwater contamination where negative air pressure draws vapors into the structure as opposed to crops which are in the open. She suggested that a fact sheet on the topic might be helpful. Mr. Gortva suggested that a fact sheet on bioaccumulation or a more detailed presentation at a future meeting might be good for further discussion.

Mr. Cherry concluded his summary of shallow water sampling results on the Waverley property by stating that assessment of remedial alternatives for Area B groundwater will have to take into account the off-post shallow detections.

Ms. Green asked if there were detections of volatile organic compounds other than TCE, PCE and benzene. Mr. Cherry said that they were the primary ones detected. He said that the benzene detections are "J" qualified lab estimates that could have come from cross contamination from the drilling rig. He said that they were included to acknowledge the data and keep them in

mind. Ms. Green asked if chloroform had been detected in the shallow Waverley wells, and Mr. Cherry said that it had not been detected.

Mr. Cherry next discussed the deep groundwater sampling results from the new borings at the Waverley property. He advised that they had been successful in drilling at four locations and obtaining preliminary screening level Packer test data. He explained imagery and geophysical logs are examined during drilling, and discussions are held with the team to determine which locations should be sampled. He explained the Packer sampling involves the use of a rubber inflatable balloon which is used to seal off the borehole and prevent water from entering above or below that zone and then a sample is collected. He said that the sample is sent to the laboratory for analysis and gives a good indication of the water quality and helps to make decisions about where to construct permanent monitoring wells. Mr. Cherry stated that the ultimate goal is to put in well locations which can be repeatedly sampled to obtain validated data to use in the risk assessment. He noted that the Packer test process is an approach used to screen potential permanent locations.

Mr. Gortva added that Mr. Cherry's description of the drilling process is part of the reason why it takes longer to construct the monitoring wells than to install a residential well. He said that a residential well is usually drilled down to a zone where the most water can be found and generally left open. He said that the monitoring well drilling process involves determining where most of the contamination is likely to be, so they may drill down to 500 feet but if no high level concentrations [or no groundwater flow at depth] is detected; the well may be set at 320 feet based upon groundwater flow and contaminant concentrations. He reiterated Mr. Cherry's statement that these decisions are made as a team in collaboration with US EPA and Maryland Department of the Environment.

Mr. Cherry advised that the highest detection in the new deep groundwater borings on the Waverley property was 210 parts per billion for PCE in the 145 to 155 feet below ground surface range and 110 for TCE at the 110 to 120 feet below ground surface range; both detections were at the same location (Waverley 1). [The Waverley 1 well is located across from the wells on Area B that have high levels of detections.] In response to a question, Mr. Cherry said the wells are about 50 to 100 feet from the fence line. Mr. Cherry said that based on this data from the preliminary Packer test results, a decision was made to propose a permanent well at the 115 to 150 feet below ground surface range. [For the deeper well further from the fenceline,] He noted that the plan was to drill down to approximately 400 feet but the deepest boring was to the range of 371-378 feet, and no TCE or PCE was detected at this depth. Mr. Cherry said that more information will be available once the permanent well is installed and sampled; he said that the information may be available at the next meeting.

Mr. Cherry summarized by stating the Packer test results are screening data, but it does not appear that there is contamination at depth on the Waverley property. [Please see slide 16 of the presentation. Packer testing for wells Waverly 2 and Waverley 3 had no detections of TCE or PCE. Well Waverley 5 had low level J flagged (estimated) detections of 0.3J ppb and 0.1J ppb for PCE at 223-238 feet below ground surface (bgs) and 253-268 bgs respectively. For the deepest well, there were no detections of PCE from 270 to 378 feet bgs. The federal drinking water standard for PCE is 5 ppb.] He said that this assumption cannot be confirmed until samples

are collected from the permanent monitoring well, although there is usually good correlation between Packer data and monitoring well results. He added that it is too early to make conclusions, but sampling should be completed before the end of the year. Mr. Cherry reiterated that there is no current use of the groundwater for potable purposes and that future use is also restricted which would limit potential exposure. He said that when the Army assesses remedial alternatives for the groundwater, the detections in these wells will need to be taken into account. He noted that the Army is not recommending any further drilling on the Waverley property; however, it is possible the regulators could request more work.

Mr. Cherry discussed the next steps to be taken. He stated that the remedial investigation is being done for all of the areas within the Area B Study Area, and each area has ongoing activities and overlapping work. He noted that the remedial investigation report will be distributed to the regulators and the community when it is completed which will then feed into the development of a feasibility study to examine groundwater remediation alternatives. Mr. Cherry said that the Army is considering potential groundwater treatability studies that could be implemented in the near future. He noted that such pilot studies provide better information for choosing the most effective remedies and ensuring the remedy will work at the site.

Mr. Craig advised that throughout the Department of Defense there are various partnering meetings where different levels of staff from the regulatory and military agencies meet to discuss environmental issues. He said that Mr. Gortva, Ms. Green and Mr. Thomson are considered Tier I partnering team participants while he and Ms. Green's and Mr. Thomson's bosses are considered Tier II. He said that the topic Mr. Cherry just mentioned is one that is important to both the Tier I and Tier II teams who are discussing how long a study would take and other details.

Mr. Gary Zolyak mentioned that the Right of Entry agreement for the Waverley parcel will be expiring soon, and he is entering into negotiations with the parcel owner to extend for some period of time, preferably another year. He noted that the extension is important to the Army because it is critical to be able to finalize the sampling and get the results so there is a good understanding of the conceptual site model.

Ms. Hahn asked if a year extension is enough time and if access is needed to remediate. Mr. Gortva said that the Army would like to collect one round of data during both low and high water conditions to help in the decision making. He advised that once this data is received, it will help determine if further testing is needed. He stated that the Army may not need to be on the Waverley property to remediate the groundwater since the concentrations are along the fence line, but it is too soon to speculate.

In response to a question about how far away the remedial action plan might be, Mr. Gortva said that it is dependent on when the regulators are satisfied that no further investigation is needed, and the Army can proceed with a Feasibility Study. He estimated that approximately one year of additional study is needed to complete the investigation phase.

Mr. Cherry next discussed further investigative work that will be done to address data gaps. He reminded the Board that there had been two elevated detections of PCE on County property

which has been discussed at many Board meetings; however, only round of data exists from shallow well sampling. He advised that in 2011 and 2012 when the direct push work was being conducted, there was refusal [of the drill bit] in several locations due to encountering bedrock and not being able to push deep enough to collect groundwater samples. He said that the plan is to return and install up to eight new permanent monitoring wells using rotary drilling or whatever equipment is needed to install a shallow point. He said that the exact locations have not yet been determined, and the work does require a right-of-entry agreement with the County. Mr. Cherry said that the new wells would be sampled twice for volatile organic compounds, and the 34 existing piezometers would also be sampled, including the well where PCE had been detected. Mr. Cherry advised that some soil gas sampling would be conducted around existing buildings to help assess the nature of shallow groundwater impacts in this area.

Mr. Cherry noted that PCE and TCE are common chemicals still in use. In response to a comment by Ms. Hahn about the levels, Mr. Gortva responded that the level of PCE detected previously on the County property was 9 parts per billion. Ms. Hahn asked if this represents a danger at this level. Mr. Gortva said that it is a low level and said when detections are above 5 parts per billion it is just an indication there needs to be [vapor intrusion] screening, not that an confirmed issue is present or there is an immediate health hazard.

Mr. Rudy expressed concern about the County offices on Montevue Lane and asked if any caution or alert had been given to the County relative to the potential for vapor intrusion. Mr. Gortva said that the Army has had discussions with the County, and prior to the occupancy of the building, the Army completed vapor intrusion testing and the results were presented at a Board meeting. Mr. Gortva said that the testing showed there were no detections of concern at the building under the slab. Mr. Rudy asked if there are any concerns related to the rehab center on Montevue, and Mr. Gortva responded that there are no wells in the area around the rehab center and that new wells is part of the additional well installation work being discussed by Mr. Cherry.

Mr. Cherry said that the next step would be to collect the groundwater samples in the downgradient area and compare them to the groundwater at Area B (a "forensic" analysis) to see if any conclusions can be drawn to say that the PCE has the same fingerprint in both locations and determine conclusively that it is coming from Fort Detrick. He said that the information is important as it would need to be factored into the remedial alternatives considered by the Army down the road in developing a treatability study or remedial design. He noted that all the activities he had discussed for this downgradient area will help provide a much better picture of what is going on in that area. Mr. Cherry said that to date there has been nothing that has triggered a need to put the additional planned field work as a higher priority, but the data still needs to be collected to complete the remedial investigation.

Ms. Green added that there is no data that indicates a immediate human health risk, but there are small data gaps that need to be filled in so there is appropriate data for the human health risk assessment phase. She said that there is no data which indicates a pressing need to take interim action.

Ms. Hahn expressed concern about children playing in seeps and springs where PCE and TCE have been detected as they are known carcinogens, as well as a concern for recreational users of

Carroll Creek. She asked if this information would be part of the risk assessment. Mr. Cherry responded that the information would be part of the risk assessment. He also clarified that PCE and TCE are known carcinogens and the five parts per billion is a drinking water standard; he stated that a municipal water supply could provide drinking water with detections of PCE and TCE as long as they were below five parts per billion. Mr. Cherry said that this might be a good topic for a future meeting so all the details could be discussed. He stated that there have been discussions with the regulatory agencies and examination of the comparison criteria to evaluate any responses that might be needed. Mr. Cherry said that the recreational value for TCE in surface water for an individual spending many days swimming in the water for a long-term duration is 38.3 parts per billion which is above the detections in Carroll Creek and the seeps and springs. Mr. Cherry said that data from the remedial investigation feeds into the human health risk assessment, and ARCADIS and the Army will be working with the regulators over the next couple months to prepare a workplan that will detail the specifics that need to be covered in the human health risk assessment, including on-post and off-post exposures and bio-uptake from agricultural products.

Mr. Cherry advised that synoptic groundwater gauging across Area B has been done several times and the information presented at previous meetings. He explained that this work is where water level measurements are collected from the monitoring well network and gauges in the streams and then plotted and contoured. He said that since new monitoring wells have been installed another round of data will be collected to refine the conceptual site model.

A question was asked about whether there has been drilling in the area labeled "G." Mr. Cherry responded the original plan called for some points in that area but access could not be obtained, so an attempt was made to drill on a County right-of-way but shallow bedrock was encountered. He said that a second attempt was made by working with the homeowners association which was also unsuccessful with the direct push technology. He said that the upcoming work will use a different drilling technology in this area.

Mr. Rudy asked what was being done to characterize Study Area A, particularly Building 568. Mr. Gortva responded that the groundwater plume is being monitored. He said that concentrations in the source area, next to the building, are currently dropping to around the drinking water standards and are below the drinking water standards as you move away from the building. Mr. Gortva said that the monitoring will continue for some years to ensure there are no changes. Ms. Green added that the monitoring is done in conjunction with extraction and treatment.

Mr. Cherry advised that additional work is planned for along Carroll Creek to complete a second comprehensive stream survey and to reassess locations of seeps and springs in the primary discharge area to ensure none have been overlooked. He stated that approximately 60 samples will be collected from seeps, springs, and surface water locations and analyzed for volatile organic compounds. Mr. Gortva noted that when the sampling is performed, the workers go to great lengths to ensure they are sampling the water before it is diluted by the stream. Mr. Gortva advised that the seeps can be very small trickles of water.

Mr. Cherry next discussed the schedule. He noted that about 99% of the work is completed with just some of the vapor intrusion components and the supplemental work just discussed remaining. Mr. Cherry displayed a chart showing the status of the activities and noted all the work is building towards a remedial investigation report, a completed conceptual site model, and a risk assessment. He also displayed a schedule of work from the Fall 2014 to the Summer/Fall 2016 with the Remedial Investigation Report targeted for submission to the regulators in the Spring 2016, followed by the Feasibility Study. He added that an activity that may occur concurrently is the potential treatability studies.

Mr. Cherry reviewed the activities to be performed between this meeting and the next meeting which will include completing the Packer sampling at the deep area B location, completing the first round of sampling from the 5 deep wells on Waverley, 2 on County property, and 1 on Area B, and submitting a work plan to the regulators outlining the supplemental off-post tasks just presented.

Mr. Cherry reviewed the 360° overview slides, including a one-page summary of the Waverley Property. Ms. Hahn commented that the slide stated "no current risks identified." She stated this implies the area is clean, yet elevated concentrations of PCE and TCE have been detected on the property. She asked if there is no current risk because there are no homes yet or no one is drinking the water. Mr. Cherry said that for there to be a risk, there has to be exposure. Dr. Green noted that there is no immediate health risk as no one is living there and that is all no current risk identified implies. Mr. Rudy suggested the statement be qualified as government officials and the public need to understand all the qualifiers to the statement. Mr. Thomson suggested no statement be made until the risk assessment is completed. Mr. Gortva said that the slide is an example and can be modified based on comments. Mr. Hoddinott said the statement is true as in order for there to be risk there needs to be a source, a pathway, an exposure route and a receptor, and currently there are no receptors. Mr. Gortva suggested modifying to say there is no current risk but future risks have to be considered. Mr. Rudy and Ms. Hahn agreed with the proposed change.

Ms. Hahn expressed her appreciation for all the work done since the last meeting to make improvements to the presentation.

8. RAB Member Open Discussion and General Community Comments

Mr. Rudy asked about the status of hooking up homes receiving bottled water to public water. Mr. Craig said that a decision document [Action Memorandum] was signed for this action to proceed, a contract was awarded for the work, and there is a contract in place. He said that the planning process is underway including obtaining needed permits. Mr. Rudy asked why homes are not immediately hooked up to public water when contaminants are detected. [At the time of the detections, public water was unavailable. Only recently was the water line installed along Kemp Lane.] Mr. Gortva responded that there were two one-time detections during drought conditions with subsequent monitoring not showing any detections. He said that the Army is taking a proactive step to connect the homes to municipal water supplies so there is no future exposure pathway.

Mr. Gortva invited topics for future meetings. Ms. Hahn suggested a presentation on the City road proposed to go through Area B. Mr. Rudy suggested that Mr. Curtis finish the presentation he began at the last meeting. Mr. Rudy also suggested that a discussion of landfill caps and their effectiveness. Mr. Rudy expressed concern about some emails that had been exchanged between Board members and suggested the issue be resolved; Mr. Gortva suggested this topic be discussed during the administrative meeting on the operating procedures. Mr. Gortva invited Board members to send him any other topics by e-mail.

Mr. Rudy, Ms. Hahn and Ms. Russell asked about land use controls on off-post property and whether the Army can impose restrictions on off-post property. Ms. Green stated that the need for land use controls would depend on the results of the risk assessment. Mr. Thomson said if the restrictions are needed on the groundwater, there could be off-post restrictions if needed to get the remedy accomplished. Ms. Kelly asked how the City could work with the Army and regulators if the City is concerned about land outside of Fort Detrick's fence line and how can land use controls be developed. Ms. Green said that the primary phase in which the contamination would be migrating off Fort Detrick's property is through the groundwater so the primary issue would be restricting groundwater use off-site, subject to any other conclusions of the risk assessment once it is developed. Ms. Green said that typically the coordination would be with the Health Department because Maryland Department of the Environment has delegated to the County the right to issue drilling permits and accessing groundwater. Ms. Russell asked if there were similar zoning or other restrictions with any other Superfund Sites in the State. Ms. Green said that she was working on a somewhat similar issue at Fort Meade which involves limiting access to groundwater. Ms. Green said that she could also check with other co-workers on similar issues throughout the State.

Ms. Hahn asked about seeps and streams. Ms. Green said that any needed restrictions would be coordinated with the property owner. She advised that Carroll Creek is considered water of the State so creeks and rivers and streams are waters of the State, but land where any signs would be placed is not waters of the State; therefore, the permission of the property owner would be needed to install such a sign.

A member of the public asked about an incident which occurred about 25 years ago when 13 cows died in the area where groundwater contamination has been identified. Mr. Gortva said that he had not seen any information in his files, and that nothing was found during the archive search that would indicate a cause for animals to suddenly drop over; he said that the issues being discussed are potential risk from long-term exposure not acute or immediate threats. Mr. Gortva said that he would go back and see if there is any other information relevant to the incident. [An incident from 1951 related to spraying herbicides along the fenceline was previously noted. The Installation Assessment of Fort Detrick, Maryland Record Evaluation Report No. 106 Volume I, JANUARY 1977, page II-11 provides that “In September 1951, eleven dairy cows died as a result of arsenical poisoning. A Fort Detrick investigation concluded that the cows apparently died as a result of eating grass which had been sprayed by a chemical weed killer containing sodium arsenite. Government employees sprayed weed killer along the Fort Detrick fences a week prior to the incident.” A copy of the report can be found in the Fort Detrick Installation Restoration Information Repository files located in the Maryland Room of the Frederick County Library.]

Mr. Zolyak advised that Mr. Randy White had sent a letter to President Obama expressing concerns about Fort Detrick. He said that a response had been sent to Mr. White from the Pentagon.

9. Future Meeting Dates

Mr. Gortva noted that the next meeting was tentatively scheduled for February 4 and all agreed to this date. He proposed future meeting dates of May 6, 2015, August 5, 2015, and November 4, 2015 (subject to room availability). No objection was made to the February 4, 2015 date.

The meeting adjourned at approximately 9:11 p.m.

Reviewed by:

Approved/Disapproved

Enclosures:
RAB Presentation Improvements and Operating Procedures
Area B Groundwater Investigation Progress Report
Meeting Sign-In Sheet

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

FORT DETRICK RESTORATION ADVISORY BOARD
LIST OF TOPICS FOR FUTURE MEETINGS

Proposed at November 2014 RAB Meeting

- City road proposed to go through Area B
- Surface water detections
- Archive search report presentation

FORT DETRICK RESTORATION ADVISORY BOARD
LIST OF PROPOSED FACT SHEETS

Proposed at November 2014 RAB Meeting

- Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA) cleanup process
- Area B Environmental History and Former Actions
- Risk Assessments
- Drilling and Investigation Activities
- Bioaccumulation and plant take-up

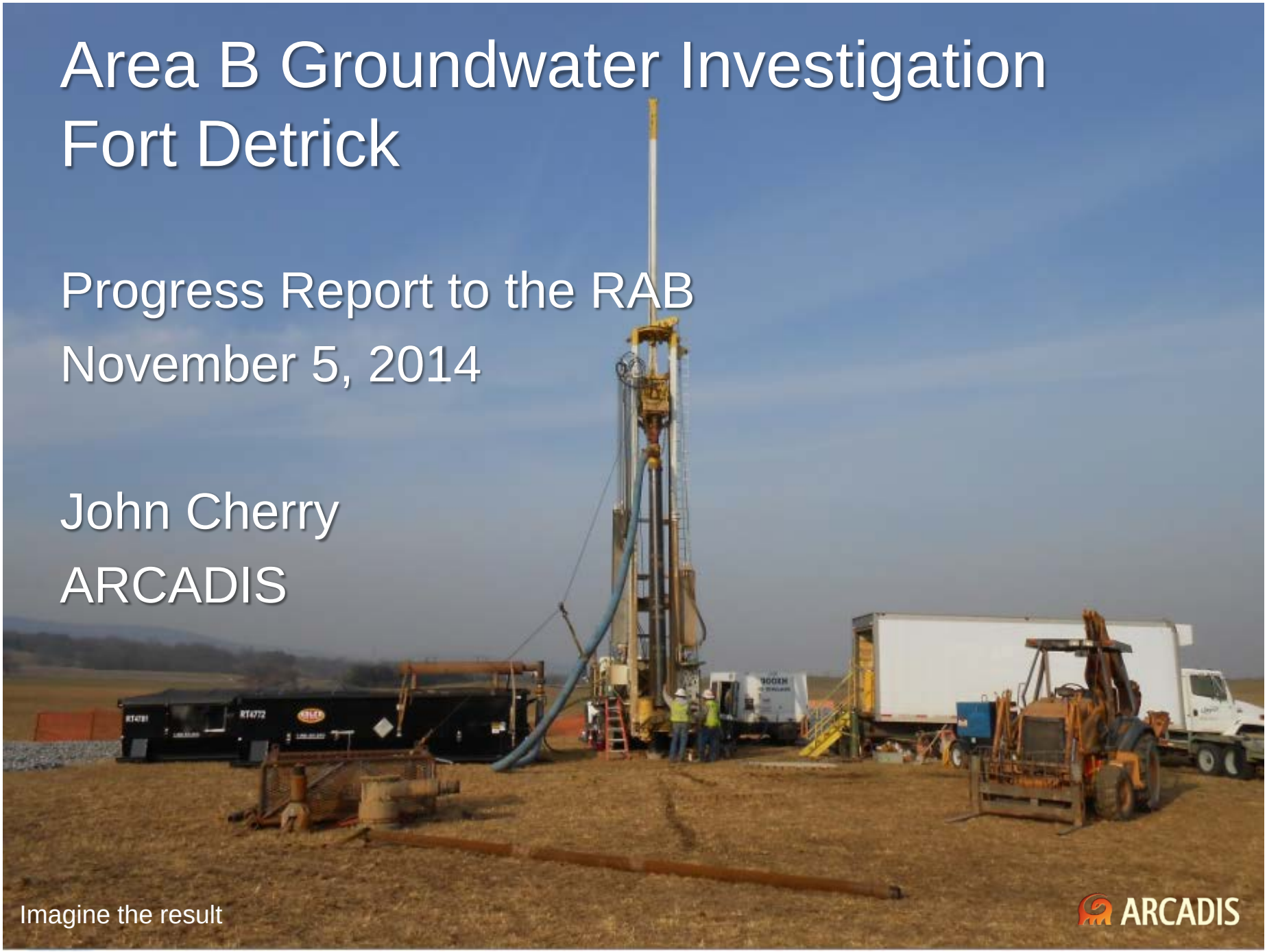
Area B Groundwater Investigation Fort Detrick

Progress Report to the RAB

November 5, 2014

John Cherry

ARCADIS



ARCADIS

Overview of Topics

- Area B Overview and Snapshot summary of new analytical results and observations since the August 2014 RAB
- Deep Drilling Update (On- and Off-Post Deep Drilling)
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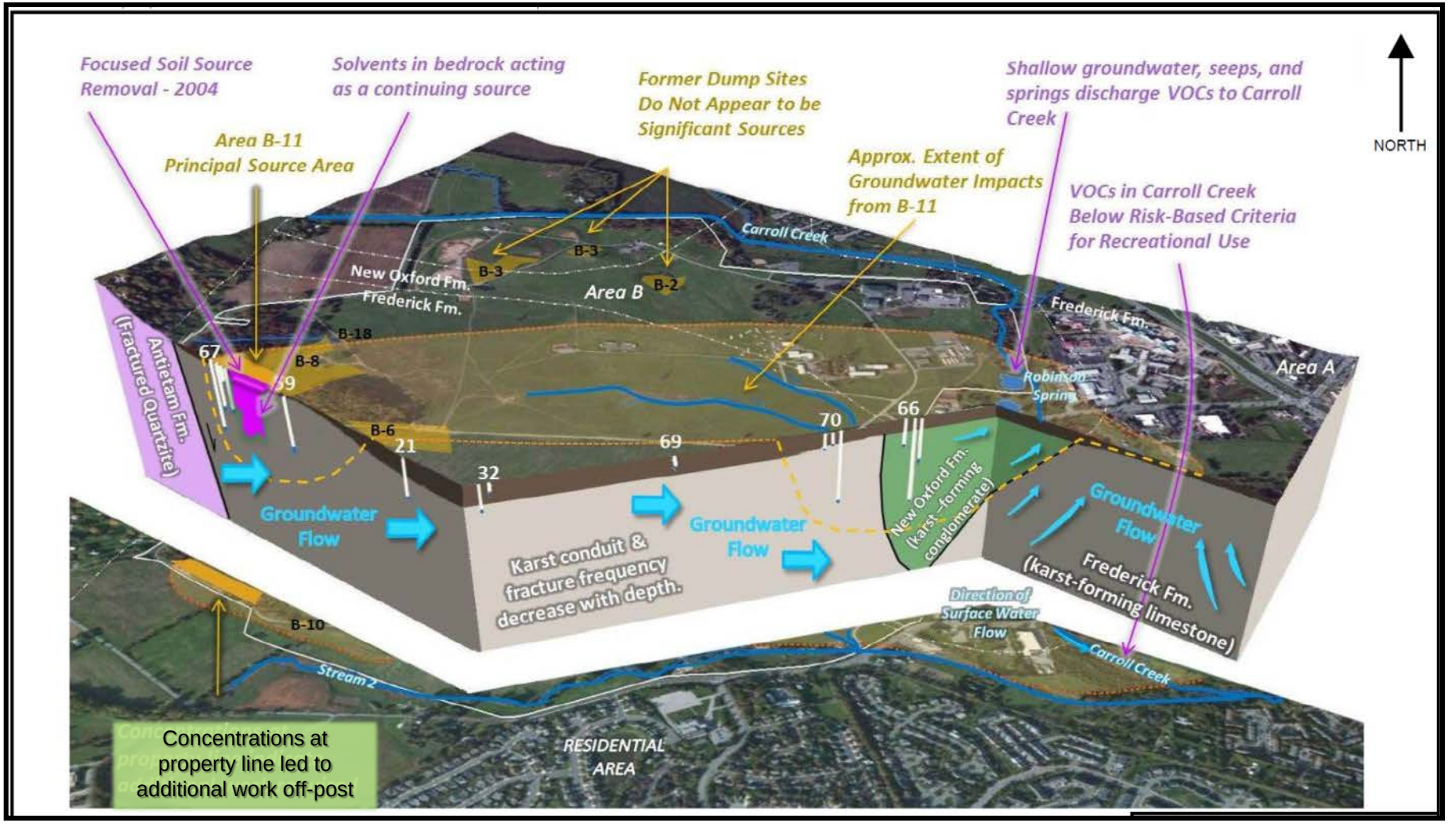
- Schedule and Next Steps

ARCADIS

Area B Conceptual Site Model Review



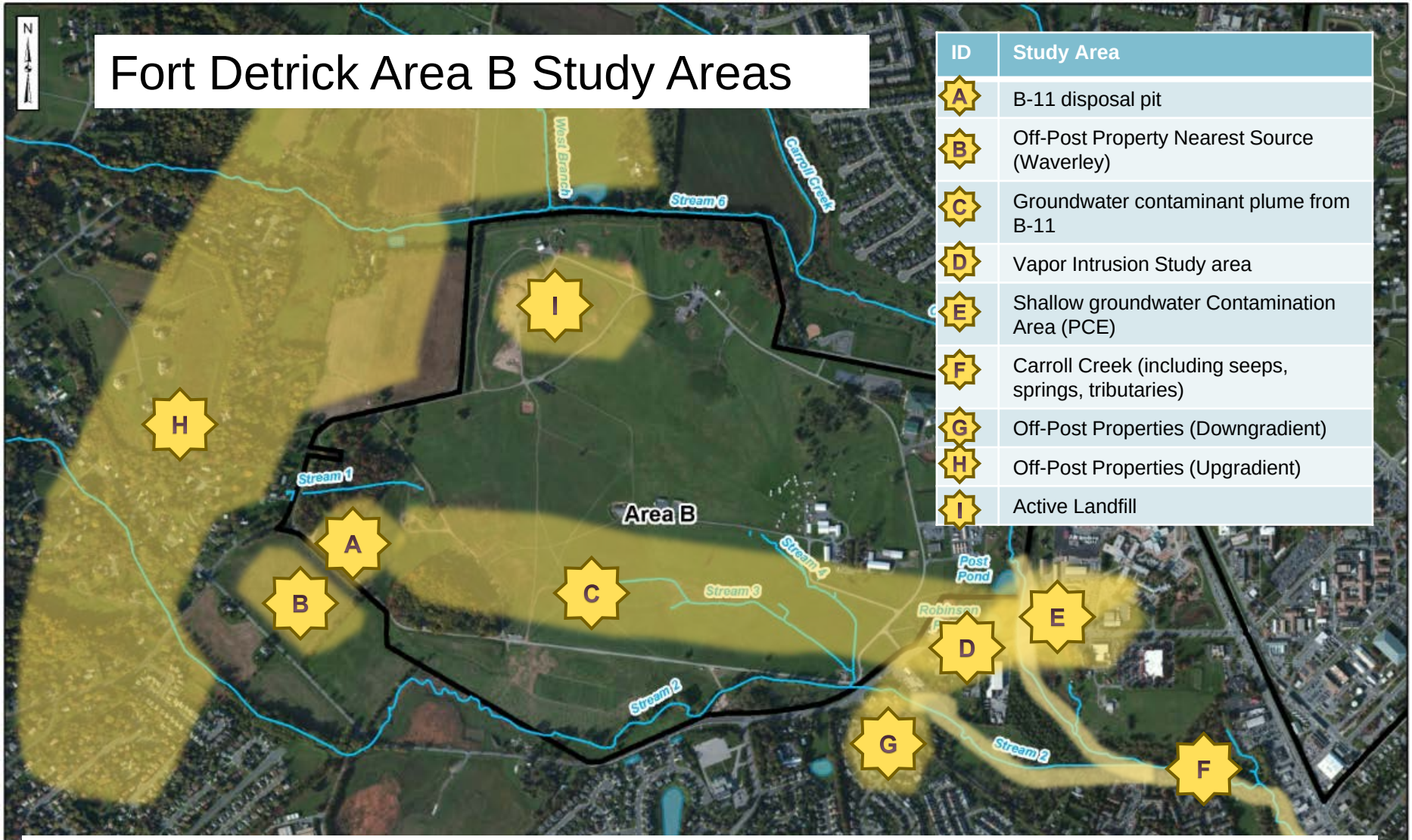
Legend

- Streams
- Spring
- B-11 Boundary
- Trichloroethene in Groundwater
- Groundwater Flow Direction
- Geologic Contact

Aerial Source: ArcGIS Online Bing Imagery accessed 6/13/2012 via ArcGIS 10.

ARCADIS

Fort Detrick Area B Study Areas



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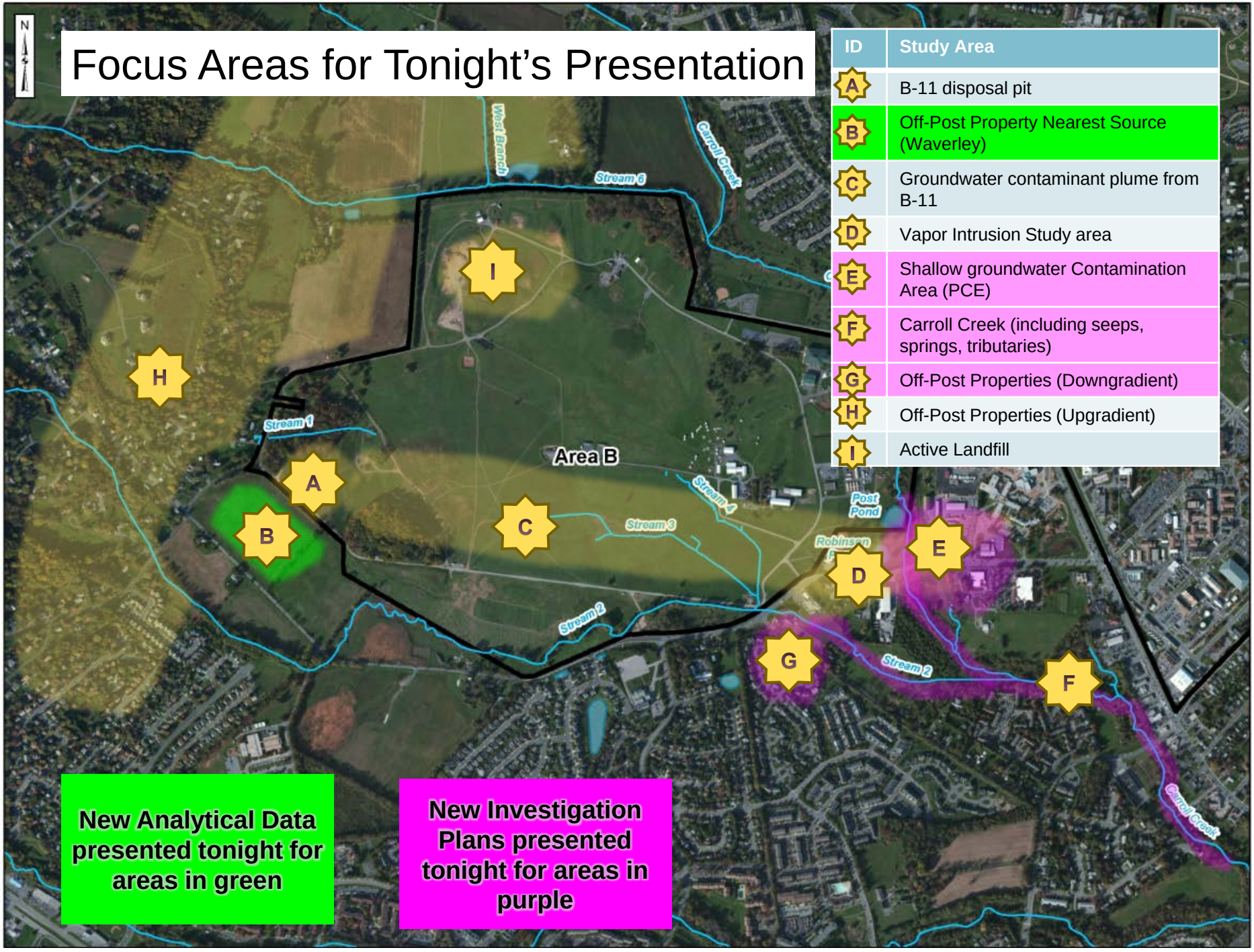
C	Groundwater contaminant plume from B-11
D	Vapor Intrusion Study area
E	Shallow groundwater Contamination Area (PCE)
F	Carroll Creek (including seeps, springs, tributaries)
G	Off-Post Properties (Downgradient)
H	Off-Post Properties (Upgradient)
I	Active Landfill

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 will be 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. Moving forward, the Army will develop and maintain summary slides for each area to keep stakeholders updated on the work in these areas as well as next steps. These slides will be included at the end of the presentation.

Focus Areas for Tonight's Presentation



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H	Off-Post Properties (Upgradient)
I	Active Landfill

New Analytical Data presented tonight for areas in green

New Investigation Plans presented tonight for areas in purple

Snapshot Updates Since the Last RAB

- Two rounds of analytical data received from 11 shallow sampling points installed and sampled on Waverley View property (by USACE).
  (Results presented tonight show shallow off-post MCL exceedances along the property line.) B
- Packer test data results received from off-post deep borings and two deep sample points completed (225-235 ft and 347-377 ft bgs) on the Waverley property.
  (Results presented tonight show deep off-post MCL exceedances in preliminary screening level packer samples along the property line but not further to the south) B
- Six decision-making discussion calls with EPA/MDE since August ’14 RAB and one all day meeting with EPA/MDE in Philadelphia.

ARCADIS

Overview of Topics

- ☑ Area B Overview and Snapshot summary of new analytical results and observations since the August 2014 RAB
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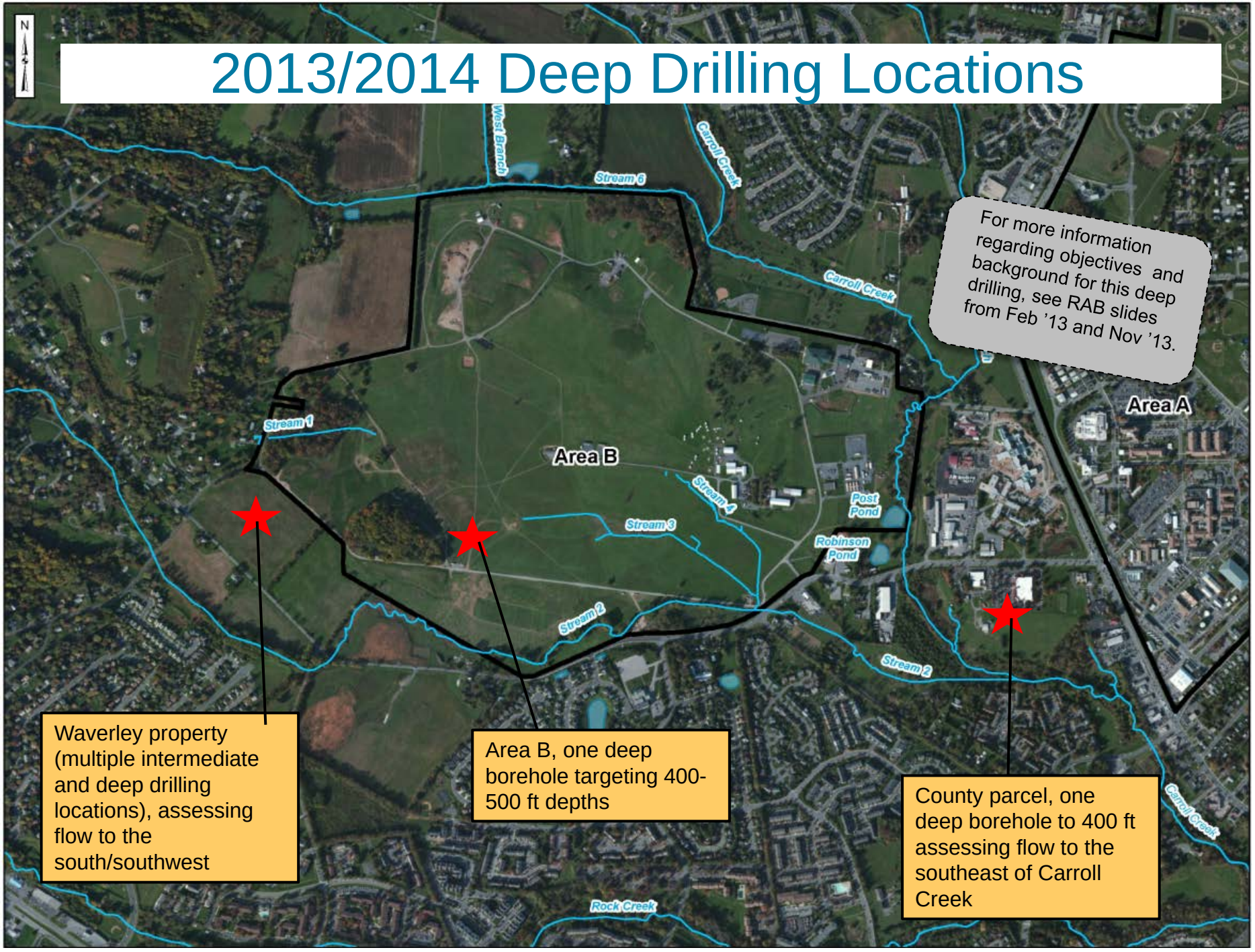
ARCADIS

2013/2014 Deep Drilling Locations

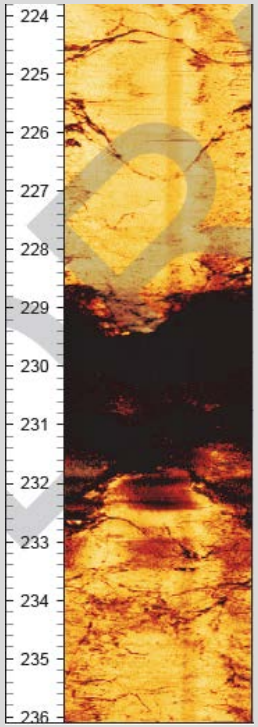


Deep Drilling Recap (2013/2014)

Methodology Reminders!

Packer sample intervals are selected in collaboration with EPA and MDE, based on:

- Geophysical testing of the borehole to identify fractures using calipers, imagery of the borehole walls, and other tools.



For more information, about the drilling and sampling approach, see RAB slides from June 2011, February 2013, & March 2014.

- Waverley B
  - 4 boring locations at Waverley Property to assess deep impacts south/southwest of Area B.

Wvly-1	Drilled to 175 ft. Screened 145-155 ft
Wvly-2	Drilled to 142 ft Screened 86-91 ft
Wvly-3	Drilled to 161 ft Screened 100-115 ft
Wvly-5	Drilled to 400 ft Screened 225-235 ft and 347-377 ft

- County C
  - 1 boring location completed to 400 ft deep to assess deep groundwater quality east of Area B and Carroll Creek.

Cnty-1	Drilled to 400 ft. Screened 99-109 ft and 382-397 ft

- Area B C
  - 1 boring drilled to 500 ft deep to assess deep impacts downgradient of B-11.
  - Completion pending.

ARCADIS

Overview of Topics

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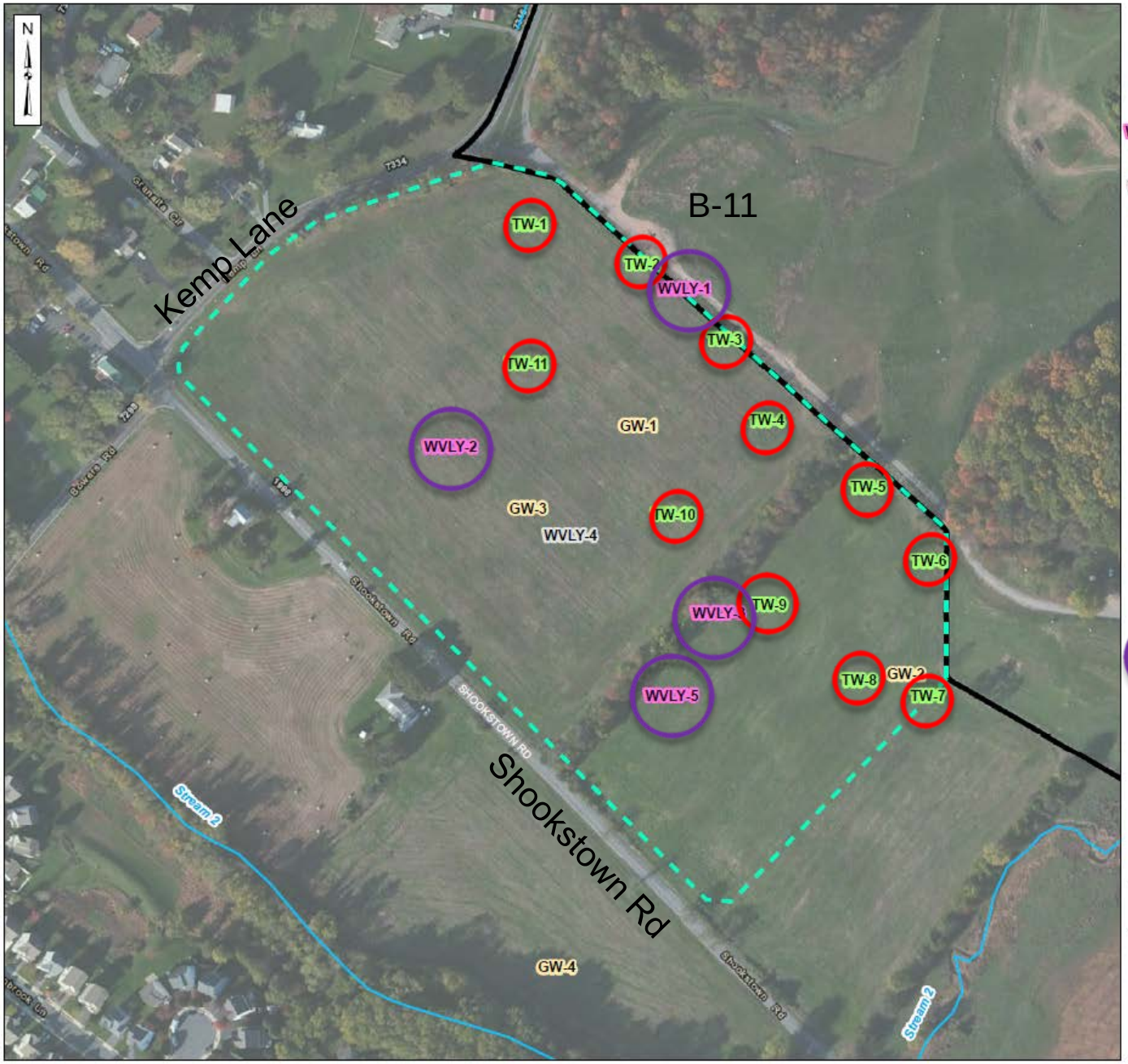
- ☐ Schedule and Next Steps

ARCADIS

New Shallow and Deep Groundwater Data Presented Tonight



Eleven shallow 'first water' borings to ~50 ft with 2 sample rounds

Four deep borings ranging in depth from 140 to 400 ft with packer samples

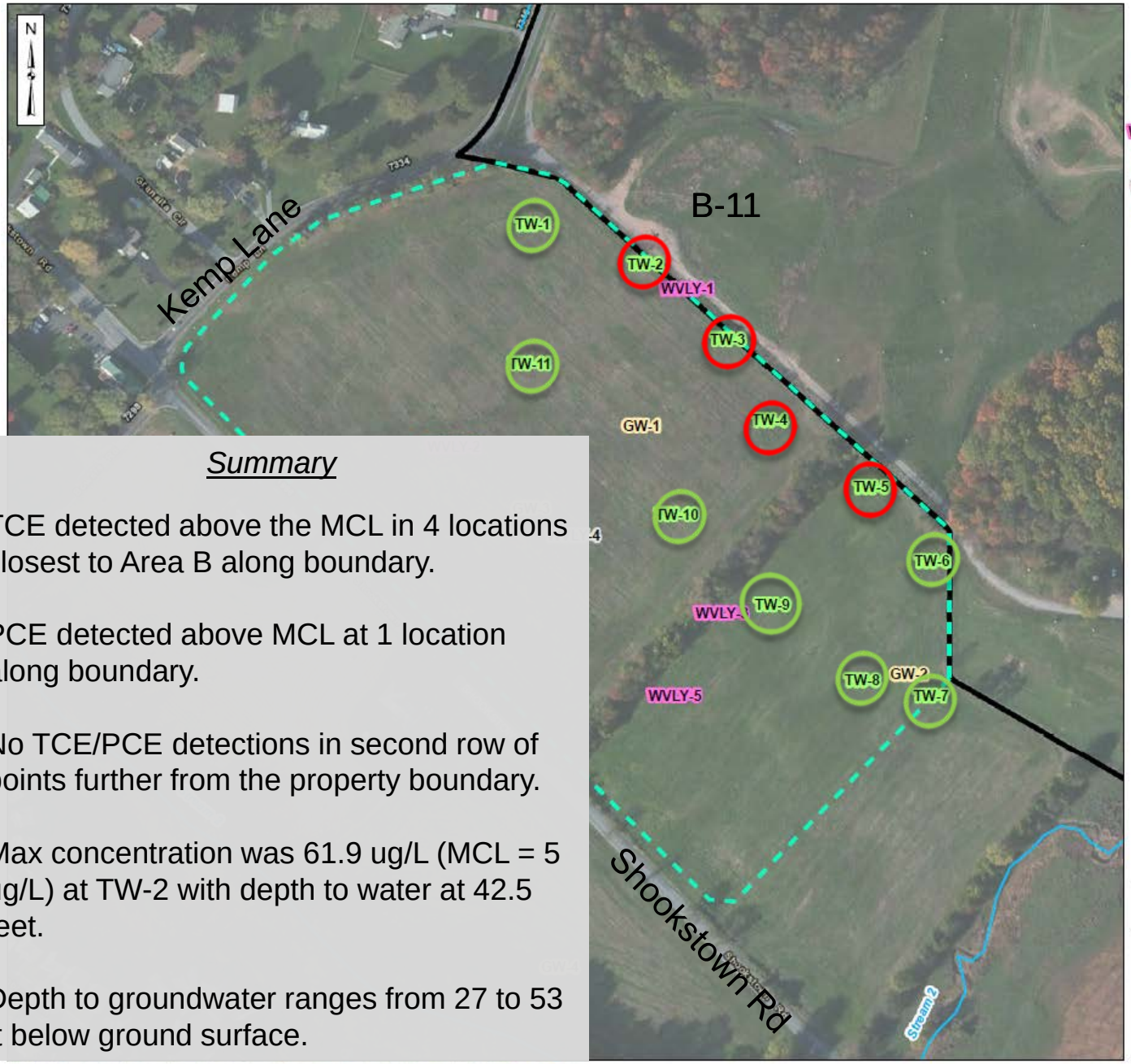
ARCADIS

Waverley Property

Area B Groundwater Investigation
Fort Detrick
Frederick, MD

B

Shallow Water Sample Results (July & August 2014)



Legend

- Fort Detrick Boundary
- Approximate ROE Boundary
- Stream
- WVLY-2 Waverley Monitoring Point (2014)
- TW-1 USACE Temp Sampling Point
- WVLY-4 Abandoned Boring Location
- GW-1 Waverley Monitoring Point (2004)

TCE and/or PCE exceeds MCL at this location in shallow groundwater.

No MCL exceedances at this location in shallow groundwater.

Summary

- TCE detected above the MCL in 4 locations closest to Area B along boundary.
- PCE detected above MCL at 1 location along boundary.
- No TCE/PCE detections in second row of points further from the property boundary.
- Max concentration was 61.9 ug/L (MCL = 5 ug/L) at TW-2 with depth to water at 42.5 feet.
- Depth to groundwater ranges from 27 to 53 ft below ground surface.

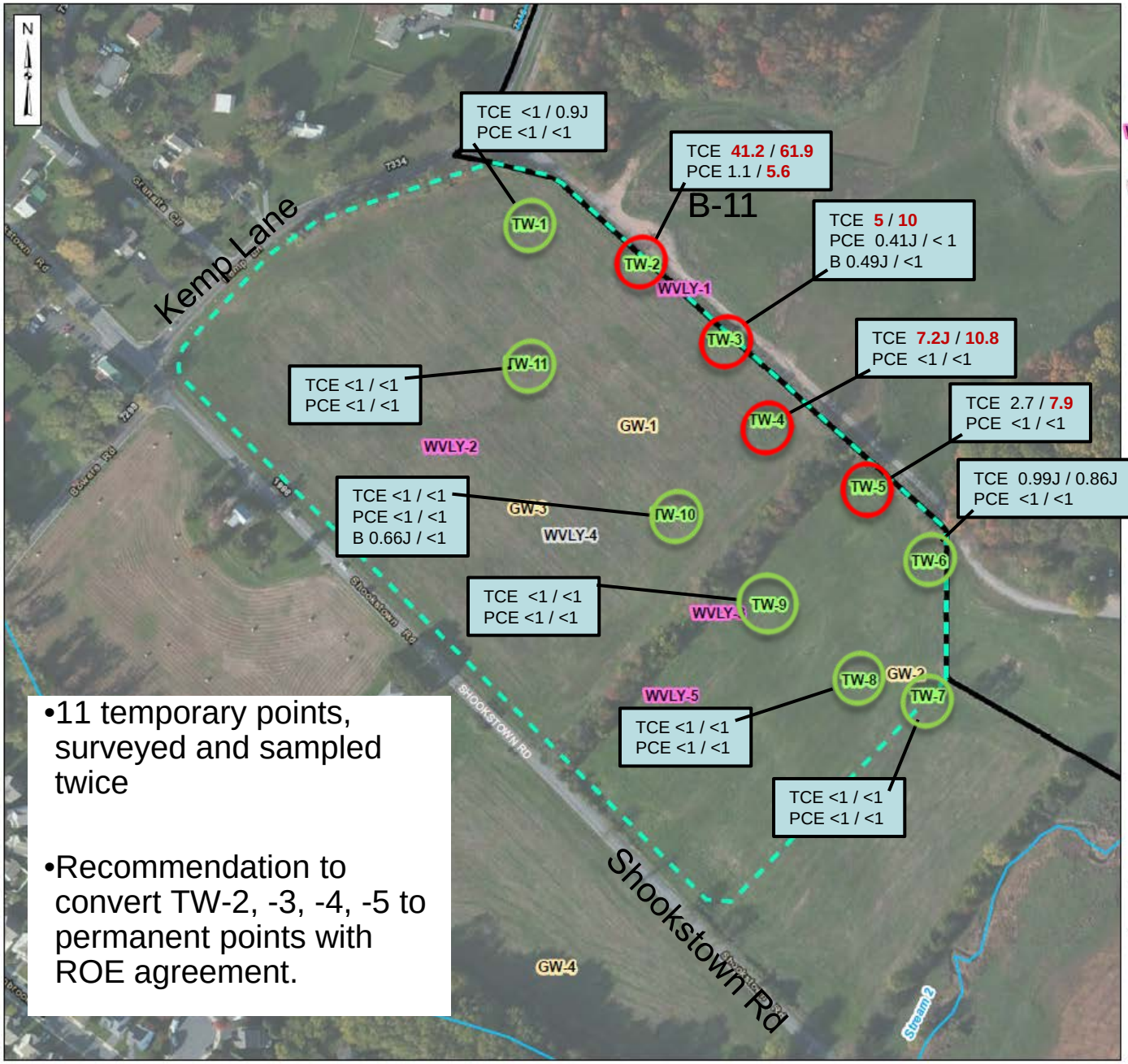
ARCADIS

Waverley Property

Area B Groundwater Investigation
Fort Detrick
Frederick, MD

B

Shallow Water Sample Results (July & August 2014)



- 11 temporary points, surveyed and sampled twice
- Recommendation to convert TW-2, -3, -4, -5 to permanent points with ROE agreement.

Legend

- Fort Detrick Boundary
- Approximate ROE Boundary
- Stream
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- Concentrations in micrograms per liter (ug/L)
- TCE = trichloroethene
- PCE = tetrachloroethene
- B = benzene
- MCL (drinking water standard):
  PCE = 5 ug/L
  TCE = 5 ug/L
  B = 5 ug/L

41.2 = bold/red text denotes MCL exceedance

ARCADIS

Waverley Property

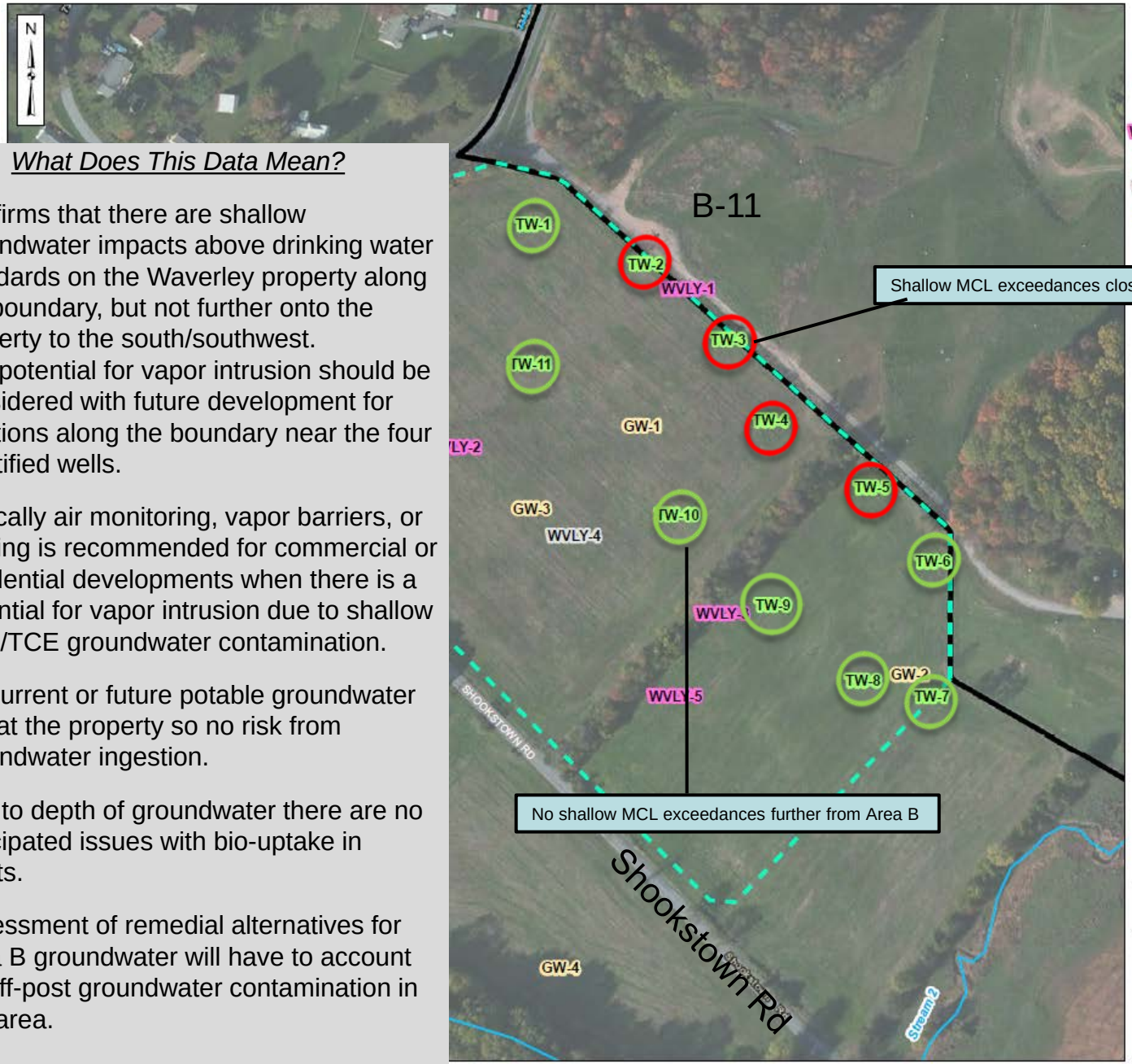
Area B Groundwater Investigation
Fort Detrick
Frederick, MD

B

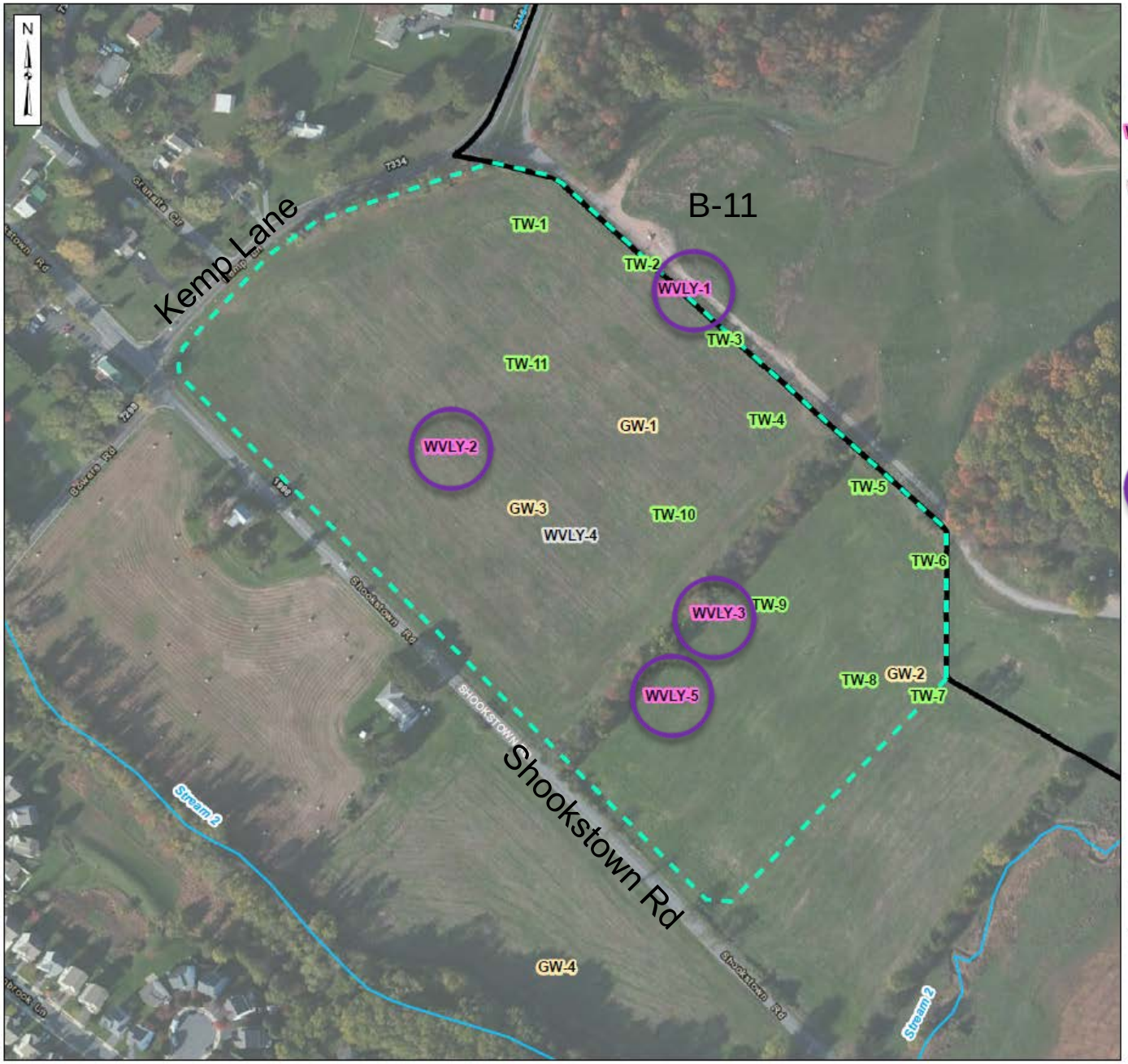
Shallow Water Sample Results (July & August 2014)

What Does This Data Mean?

- Confirms that there are shallow groundwater impacts above drinking water standards on the Waverley property along the boundary, but not further onto the property to the south/southwest.
  The potential for vapor intrusion should be considered with future development for locations along the boundary near the four identified wells.
- Typically air monitoring, vapor barriers, or venting is recommended for commercial or residential developments when there is a potential for vapor intrusion due to shallow PCE/TCE groundwater contamination.
- No current or future potable groundwater use at the property so no risk from groundwater ingestion.
- Due to depth of groundwater there are no anticipated issues with bio-uptake in plants.
- Assessment of remedial alternatives for Area B groundwater will have to account for off-post groundwater contamination in this area.



Deep Water Sample Results at the Waverley Property



Four deep borings ranging in depth from 140 to 400 ft with packer samples

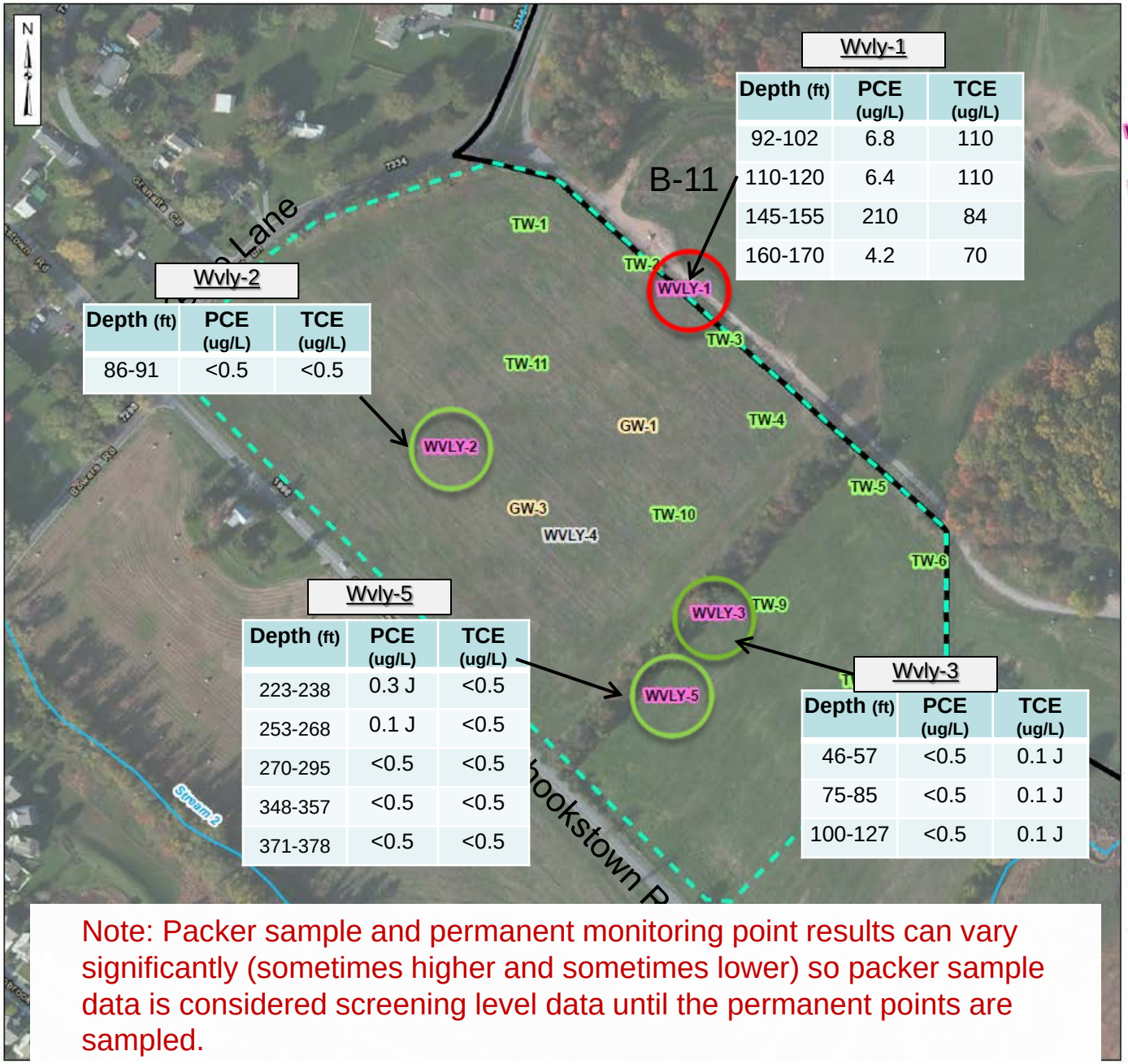
ARCADIS

Waverley Property

Area B Groundwater Investigation
Fort Detrick
Frederick, MD

B

Summary of Deep Water Packer Test Results



Wvly-1

Depth (ft)	PCE (ug/L)	TCE (ug/L)
92-102	6.8	110
110-120	6.4	110
145-155	210	84
160-170	4.2	70

Wvly-2

Depth (ft)	PCE (ug/L)	TCE (ug/L)
86-91	<0.5	<0.5

Wvly-5

Depth (ft)	PCE (ug/L)	TCE (ug/L)
223-238	0.3 J	<0.5
253-268	0.1 J	<0.5
270-295	<0.5	<0.5
348-357	<0.5	<0.5
371-378	<0.5	<0.5

Wvly-3

Depth (ft)	PCE (ug/L)	TCE (ug/L)
46-57	<0.5	0.1 J
75-85	<0.5	0.1 J
100-127	<0.5	0.1 J

Legend

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- Approximate ROE Boundary
- Stream
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- GW-1 Waverley Monitoring Point (2004)

TCE and/or PCE exceeds MCL at this location in deep groundwater.

No MCL exceedances at this location in deep groundwater.

Note: Packer sample and permanent monitoring point results can vary significantly (sometimes higher and sometimes lower) so packer sample data is considered screening level data until the permanent points are sampled.

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Waverley Property

Area B Groundwater Investigation
Fort Detrick
Frederick, MD

B

Packer Sampling versus Monitoring Point Sampling

Packer sampling

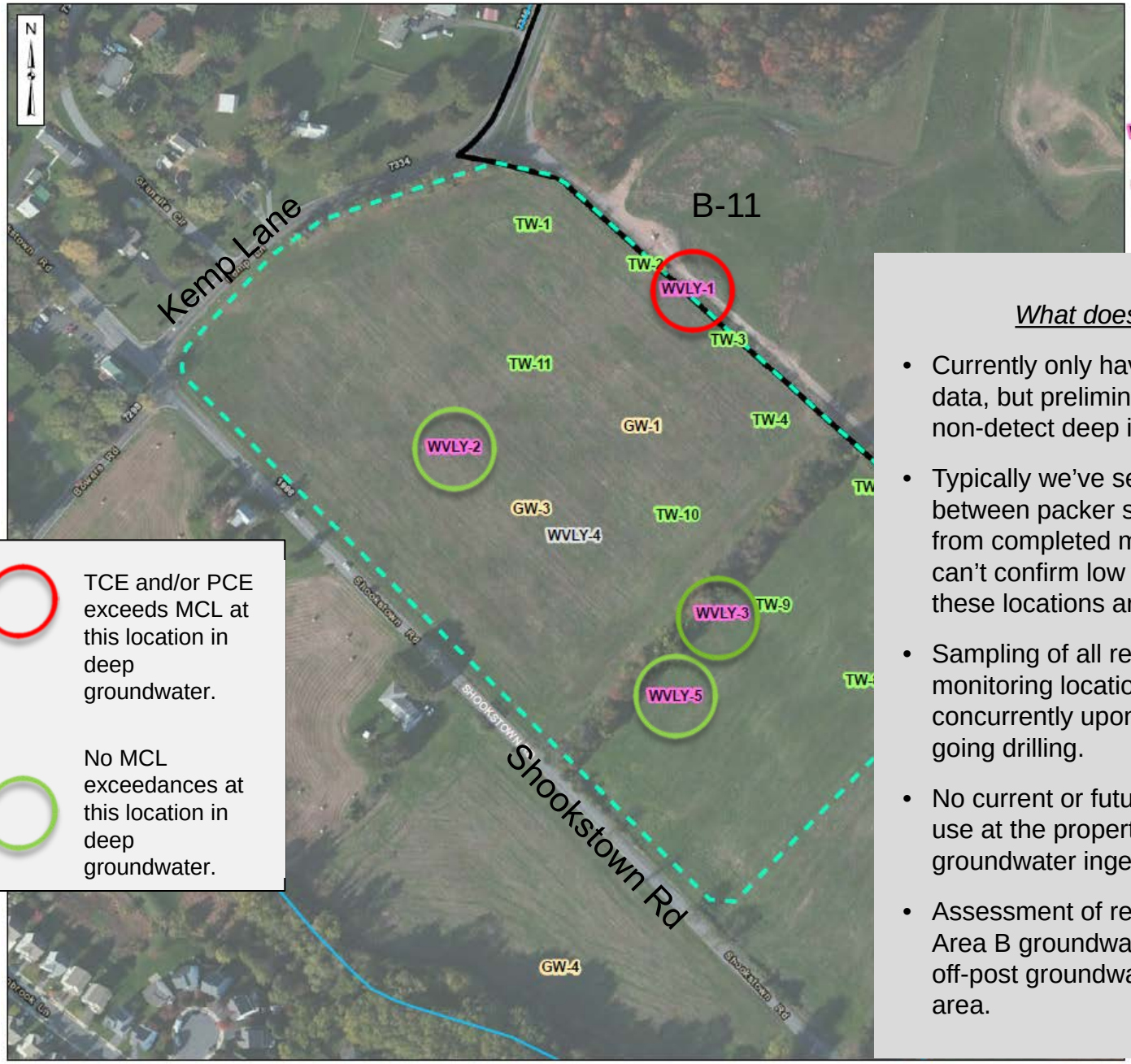
- Conducted during drilling activities using inflatable packers to isolate fractures, purge test intervals, and collect groundwater samples for laboratory analysis.
- Results are considered “screening level” suitable for deciding construction specifications, but not as reliable as data from a completed monitoring location.

Permanent Monitoring Point sampling

- Once a permanent point is built and the grout is allowed to set, the location is pumped and surged to “develop” it. This removes silt and fine-grained material from the vicinity of the screen to establish a reliable monitoring point.
- The location is allowed to settle for a week before sampling to allow the groundwater to return to steady-state conditions.
- Permanent locations provide reliable and reproducible data that can be validated and used to characterize nature and extent of contamination and evaluate risks.

Note that data presented tonight is from packer sampling. Permanent monitoring points will be sampled later this year and data may be available for the next RAB.

Summary of Deep & Shallow Test Results



Legend

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TCE and/or PCE exceeds MCL at this location in deep groundwater.

No MCL exceedances at this location in deep groundwater.

What does this data mean?

- Currently only have screening level packer data, but preliminary results indicate low or non-detect deep impacts in this area.
- Typically we've seen good correlation between packer sample data and samples from completed monitoring locations, but we can't confirm low packer test results until these locations are sampled later this year.
- Sampling of all recently completed monitoring locations will be done concurrently upon conclusion of the on-going drilling.
- No current or future potable groundwater use at the property so no risk from groundwater ingestion.
- Assessment of remedial alternatives for Area B groundwater will have to account for off-post groundwater contamination in this area.

B

Combined Summary of Deep & Shallow Test Results

Legend

- Fort Detrick Boundary
- Approximate ROE Boundary
- Stream
- WVLY-2 Waverley Monitoring Point (2014)
- TW-1 USACE Temp Sampling Point
- WVLY-4 Abandoned Boring Location
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TCE and/or PCE exceeds MCL at this location in groundwater.

No MCL exceedances at this location in groundwater.

No MCL exceedances in previous data provided by property owner.

The Army's preliminary observations to date are consistent with the original conceptual site model :

- **Groundwater impacts south of the Detrick property line do not extend far beyond the property line and concentrations drop off quickly in this direction by orders of magnitude.**

To confirm preliminary observations, samples from permanent monitoring points are needed (Dec 2014).

<u>Next Steps</u>: To complete Remedial Investigation for all on- and off-post Area B study areas and to assess remedial alternatives in a Feasibility Study, all on-going and proposed work and human health risk assessment must be completed and submitted for EPA and MDE for review (~ mid/late 2016). Note that potential groundwater pilot treatability studies are being discussed with EPA and MDE.

B

Overview of Topics

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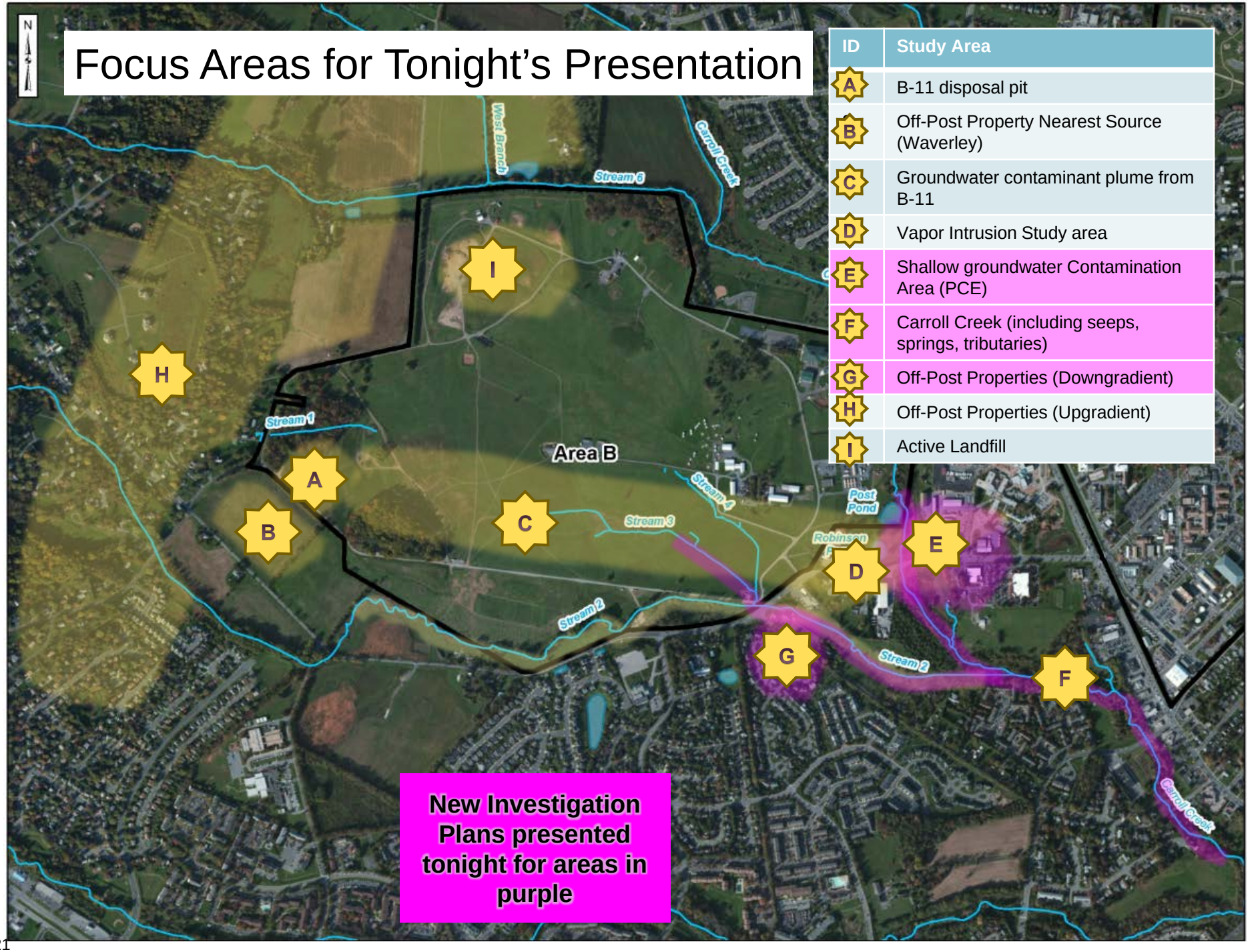
Focus Areas for Tonight's Presentation



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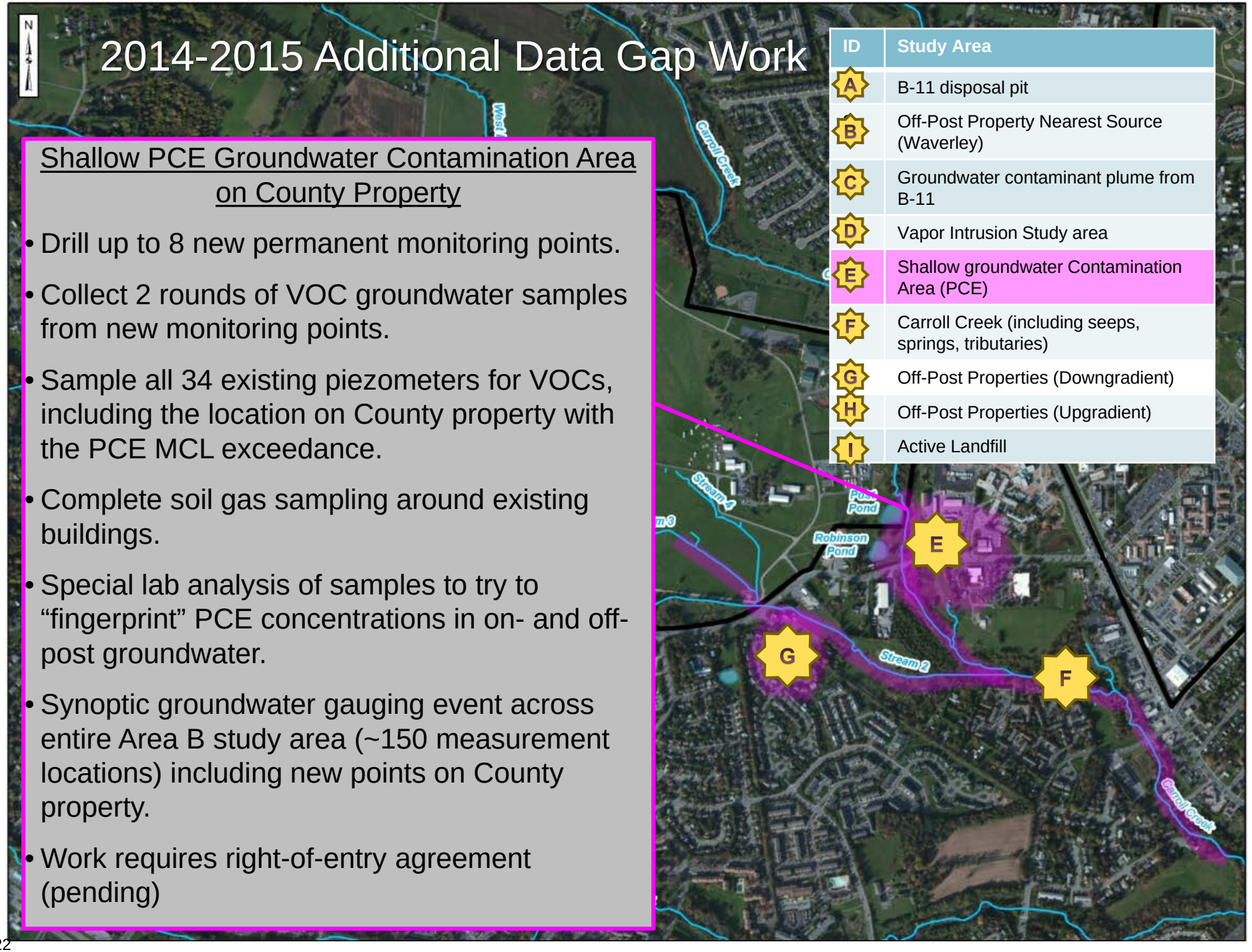
I	Active Landfill

New Investigation Plans presented tonight for areas in purple

2014-2015 Additional Data Gap Work



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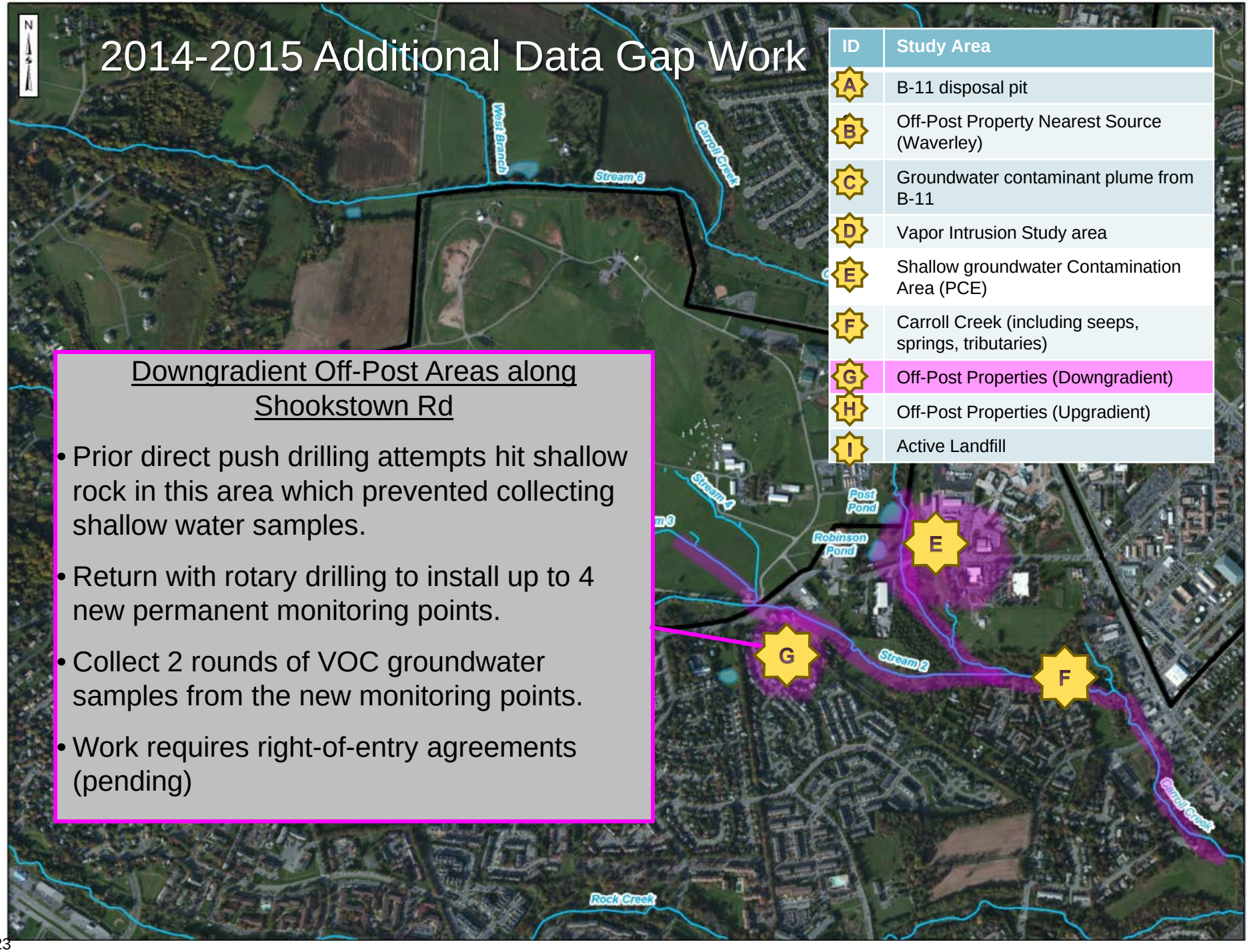
Shallow PCE Groundwater Contamination Area on County Property

- Drill up to 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.
- Complete soil gas sampling around existing buildings.
- Special lab analysis of samples to try to “fingerprint” PCE 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.
- Work requires right-of-entry agreement (pending)

2014-2015 Additional Data Gap Work



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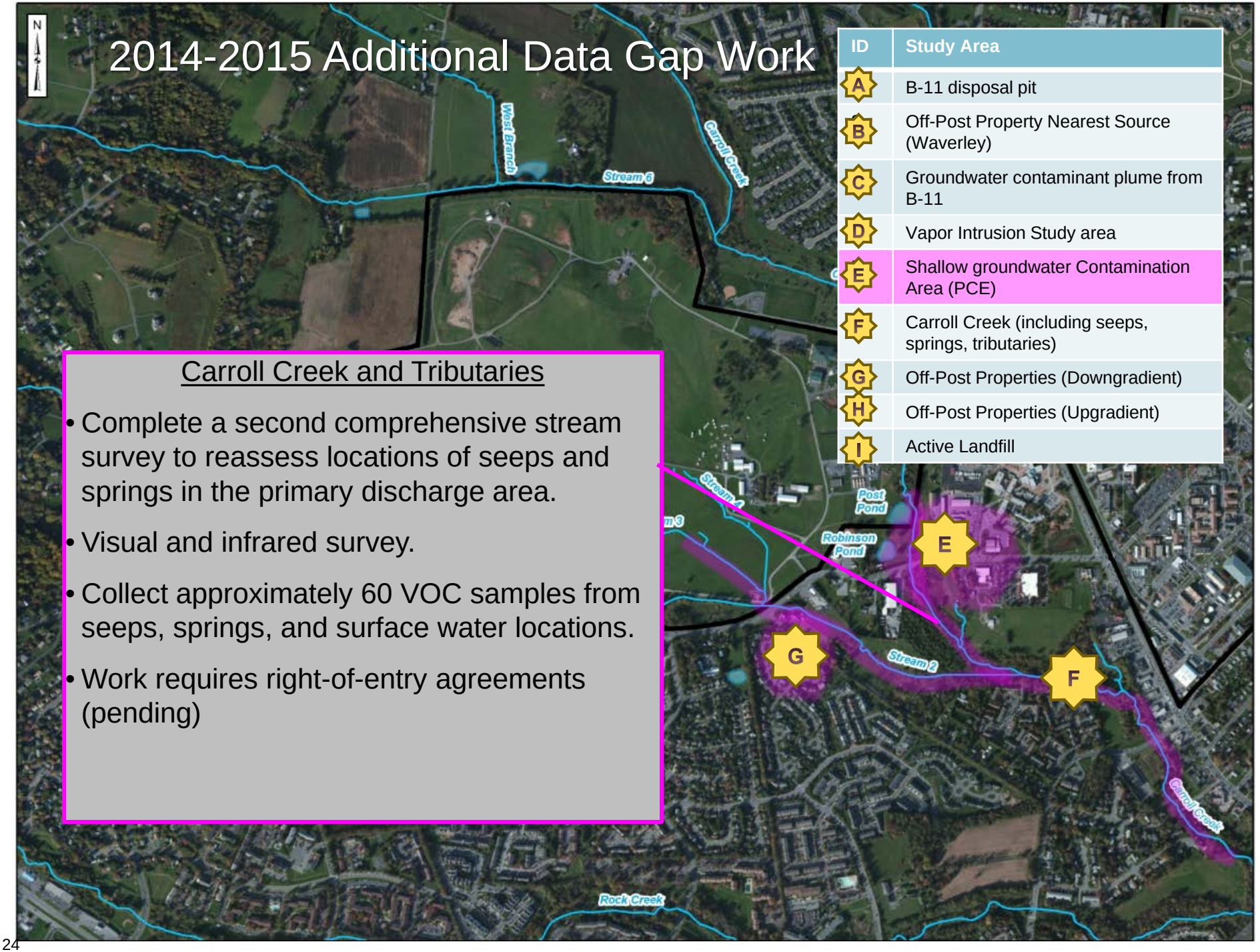
Downgradient Off-Post Areas along Shookstown Rd

- Prior direct push drilling attempts hit shallow rock in this area which prevented collecting shallow water samples.
- Return with rotary drilling to install up to 4 new permanent monitoring points.
- Collect 2 rounds of VOC groundwater samples from the new monitoring points.
- Work requires right-of-entry agreements (pending)

2014-2015 Additional Data Gap Work



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Carroll Creek and Tributaries

- Complete a second comprehensive stream survey to reassess locations of seeps and springs in the primary discharge area.
- Visual and infrared survey.
- Collect approximately 60 VOC samples from seeps, springs, and surface water locations.
- Work requires right-of-entry agreements (pending)

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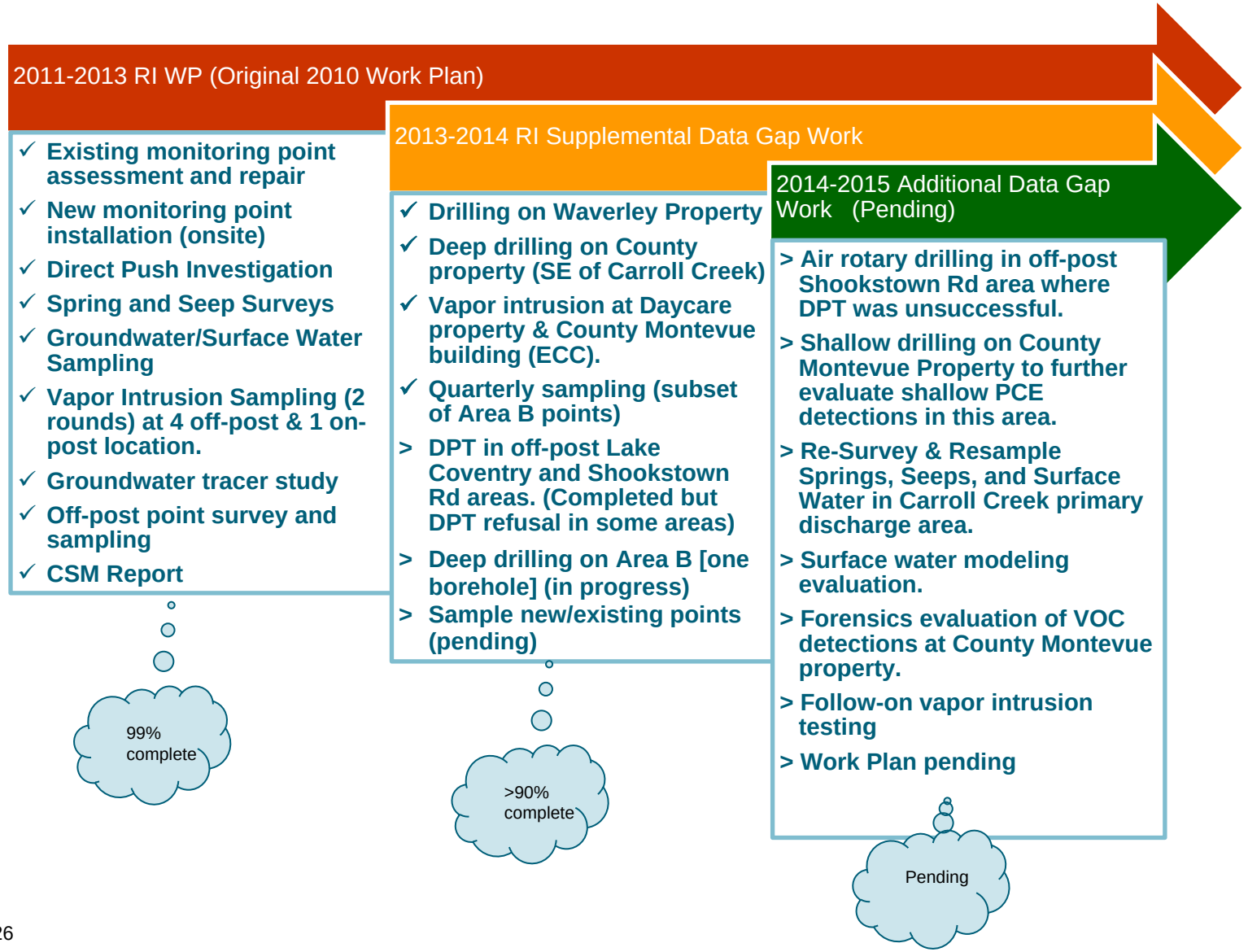
Status of On-going Area B RI Activities



Remedial Investigation Report

- Updated CSM
- Human health & ecological risk assessment
- Spring 2016 to EPA & MDE

ARCADIS

Area B Schedule

Fall 2014	RI and HHRA Work Plan Preparation Right-of-Entry negotiations
Spring 2015	EPA/MDE Work Plan Review/Approval Mobilization, Utility Clearance, Site Prep
Summer 2015	Shallow drilling & additional RI tasks
Fall 2015	RI tasks completed & RI report preparation/ Army review
Spring 2016	RI report submittal to EPA/MDE
Summer/Fall 2016	Feasibility Study to EPA/MDE to assess remedial alternatives (note that potential groundwater pilot treatability studies are being discussed with EPA and MDE)

Activities Between Now and Next RAB Meeting

- Complete packer sampling at deep Area B location, review analytical data with EPA/MDE, and construct permanent deep monitoring point.
- Complete first round of sampling for the 8 new deep monitoring points (5 on Waverley property, 2 on County property, and 1 on Area B). New data possibly available for the next RAB.
- Continue to work with EPA and MDE to review results from investigation activities completed to date to identify any data gaps the Army must address to stay on track for achieving Final Remedial Investigation under CERCLA.
- Submit work plan and schedule to EPA and MDE for the supplemental off-post Area B tasks presented tonight. This work expected to start in Spring 2015.

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Questions and Discussion

Area B 360° Overview Slides

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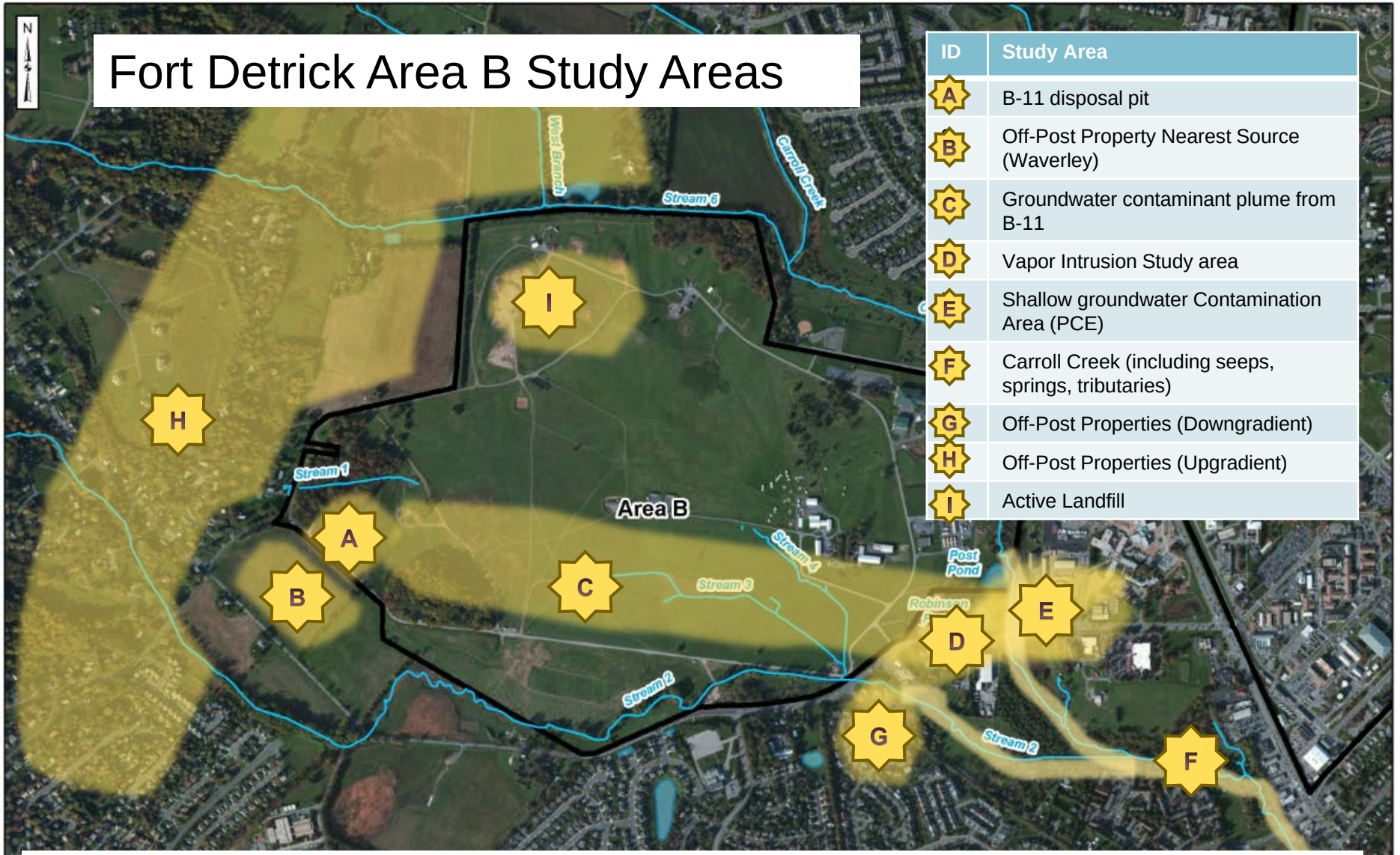
Fort Detrick Area B Study Areas



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 will be 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. Moving forward, the Army will develop and maintain summary slides for each area to keep stakeholders updated on the work in these areas as well as next steps..

Area B 360° Overview Slides

Map ID	Study Area	Previous RAB Presentations for Additional Information	Status of 360° Overview Slides
A	B-11 disposal pit	See ID#3 for RAB presentations discussing groundwater contamination originating from B-11 area.	*Pending*
B	Off-Post Property Nearest Source (Waverley)	Nov ’13, Mar ‘14, Nov ’14 (drilling updates with data)	Updated November 2014
C	Groundwater contaminant plume from B-11	Nov ’12 (April 2012 data summary) Feb ’13 (Sept 2012 data summary; vertical contaminant distribution discussion; karst drilling, geophysical logging, permanent point construction decisions) Mar ‘14 (dye trace study recap)	*Pending*
D	Vapor Intrusion Study area	May ’13 (VI overview)	*Pending*
E	Shallow groundwater Contamination Area (PCE)	Aug ’13 (direct push study summary)	*Pending*
F	Carroll Creek (including seeps, springs, tributaries)	Mar ‘14 (dye trace study recap)	*Pending*
G	Off-Post Properties (Downgradient)	Aug ’13, Nov ‘13 (direct push study summary)	*Pending*
H	Off-Post Properties (Upgradient)	Feb ’13 through Aug ’14 Mar ‘14 (dye trace study recap)	*Pending*
I	Active Landfill	See Nov ’12, Feb ‘13 groundwater data near landfill, but not discussed directly.	*Pending*

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Off-Post Property Nearest Source (Waverley Property)

Description

- Undeveloped privately-owned property across property line from former B-11 disposal pit (See Map ID A)
- Currently used for agriculture (corn, soybeans)
- Future residential development considered likely.
- Depth to first water is approx. 25-50 ft bgs.

Relevant Investigation Work Completed

- 2004: seven monitoring points installed to depths up to 100 ft bgs (installed by property owner)
- 2013/2014: eleven monitoring points to ~50 ft bgs installed along the property line; five intermediate/deeper points to 91, 115, 155, 235, and 377 ft bgs (installed by Army)
- Points on property monitored during Area B tracer study.

Investigation Highlights

- TCE detected above MCL (5 ppb) in four shallow groundwater sample points closest to the across from B-11. Highest concentration was 61.9 ppb.
- Boring Wvly-1 to 170 ft bgs, located ~100 ft from property boundary found TCE at 70 to 210 ppb in four screening packer samples collected during drilling.
- During tracer study, no tracer introduced at B-11 was detected in any monitoring points on this property or other areas to the south and west.
- Wvly-5: Preliminary data from deep packer samples during drilling found trace, estimated concentrations of PCE (0.3 J ppb at 228-233 ft bgs) and non-detect at depth (<0.1 ppb at 348-357 and 371-378 ft bgs). Points constructed and sampling pending.

Risk & Potential Receptors

- No current risks identified.
- Current and future groundwater use is prohibited, so no potential exposure to contaminated groundwater.
- Groundwater contamination migrates onto the property at depth, so no soil contamination.
- Corn, soybeans not at risk due to depth of groundwater.
- No current vapor intrusion issues, but future development along the property boundary next to B-11 should consider monitoring, vapor barriers, vapor removal systems, or similar approaches to prevent potential exposure.

Data Gaps & Next Steps

- The five new deep/intermediate points have not yet been sampled (except packer sampling during drilling). Sampling pending.
- 4 of the shallow temporary points with MCL exceedances near property boundar may be converted to permanent points.
- Currently, no other drilling or investigation on this off-post property is planned or recommended (pending EPA/MDE review)
- Draft human health risk assessment & Area B RI report slated for Summer 2016 (pending completion of work in other areas).
- Draft Feasibility Study report to assess remedial alternatives for Area B anticipated in late 2016. Pilot treatability studies may be considered too. Path forward decisions require EPA and MDE concurrence.