Brevard Final Remedial Investigation Report (RIR)

North Carolina Department of Environmental Quality (DEQ) Comments and DuPont Responses

Contents:

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

July 30, 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jamie VanBuskirk
DuPont Engineering
6324 Fairview Road
Charlotte, North Carolina 28210

Re: **Comments on Remedial Investigation Report**
Former DuPont Brevard Facility
EPA ID No. NCD 003 152 329

Dear Mr. VanBuskirk,

The North Carolina Hazardous Waste Section (HWS) has reviewed the Remedial Investigation Report (RIR) submitted May 6, 2015 for the DuPont Facility in Brevard and has the attached comments. DuPont should provide a response to these comments within thirty (30) days of receipt of this letter. Response to these comments could include submittal of a workplan to address the comments or notification that these comments will be addressed in a risk-based Remedial Action Plan (RAP) proposed to be developed for the site. The HWS encourages DuPont representatives to contact the HWS for a meeting to discuss the issues raised by these comments.

Please contact me at 919-707-8207 or by email at mark.wilkins@ncdenr.gov if you have any questions about this letter.

Sincerely,

Mark Wilkins, Hydrogeologist, Hazardous Waste Section
Division of Waste Management, NCDENR

Attachment

ec: John Johnston, US EPA, Region 4
Joe Hudyncia, NC DA&CS
Brent Burch
Bud McCarty
Mark Wilkins

Comments on Remedial Investigation Report
Former DuPont Brevard Facility
EPA ID No. NCD 003 152 329

The focus of our review was the Remedial Investigation Report (RIR) submitted May 6, 2015. Past data gathered during previous investigations at the site were also looked at during our review. In addition, the HWS acknowledges that the Facility has proposed to remediate the site following NCGS 130A-310.65 to 310.77 requirements. Therefore any review of the RIR should take into account the information that will be needed for approval of a RAP that meets the requirements in NCGS 130A-310.65 to 310.77.

Additional information required to complete assessment or related to the RIR.

1. DuPont should install a minimum of two (2) monitoring wells just east of the DuPont State Forest (DSF) Visitor Center. One of the wells should be screened across the water table. Another well should be screened at the top of bedrock. If bedrock is encountered prior to encountering the water table, DuPont should attempt to screen a well(s) at the first water bearing fracture encountered in bedrock. The purpose of these wells is to help determine the extent of groundwater contamination north of Solid Waste Management Unit (SWMU) 17.

2. Due to occasional detections of contaminants in samples collected from DERA Creek during historical surface water monitoring, DuPont should develop a surface water monitoring plan to collect samples quarterly for a one year period from DERA Creek. Due to the detection of contaminants above NC 2B standards, the monitoring plan should include sample collection from the seep area downgradient of the former WWTP polishing pond. The monitoring plan should include at least one sampling event during a period when surface water flow is typically at lower flow conditions based on historical information. In addition, as stated in Comment 12 of the September 25, 2014 letter from the HWS to DuPont, if Polycyclic Aromatic Hydrocarbons (PAHs) were detected in sediment samples collected during the RI, analysis of surface water for the presence of PAHs may be required. Since PAHs were detected in DERA Creek sediment, PAHs should be added to the list of analytes for surface water samples collected during these quarterly monitoring events.

3. To provide a visual representation of areas of the site that are contaminated DuPont should develop figures that show:
   a. location and extent of soil contamination found in samples collected at the 0 – 1 foot and 0 – 2 foot intervals that are above residential (unrestricted) remediation goals as listed in the Inactive Hazardous Sites Branch (IHSB) Preliminary Soil Remediation Goals (PSRG) Table;
   b. location and extent of soil contamination found in samples collected at the 0 – 1 foot and 0 – 2 foot intervals that are above industrial remediation goals as listed in the IHSB PSRG Table;
   c. location and extent of soil contamination found in samples collected more than 2 feet below land surface that are above industrial remediation goals as listed in the IHSB PSRG Table;
   d. location and extent of areas that must be remediated or must have restricted uses based on the calculated most restrictive proposed use of the site;

e. location and extent of areas that must have restricted uses due to potential vapor intrusion issues;
f. location and extent of areas of surface water contamination above NC 2B standards;
g. location and extent of sediment contamination where the recalculated Hazard Quotient (HQ) for ecological effects due to any constituent detected in the sediment is greater than 1; and,
h. the location and extent of groundwater contamination above NC 2L standards in the surficial and bedrock aquifers.

**This information is not only necessary to identify contaminated areas and their extent but will be critical in development of any Land Use Restrictions (LURs) established at the site.

4. In Sections 5.1.2. and 7.5.2., DuPont indicates that a two-foot soil cover is not present over all areas of contamination at the site. DuPont should provide a figure that locates any areas at the site where surface covers are insufficient.

5. In Section 7.5.1. and 7.5.2. of the RIR, DuPont states "Potentially complete exposure pathways for this receptor may include … inhalation of soil-derived particulates." When considering these potential pathways, DuPont should include inhalation of volatile constituents present in the soil along with inhalation of soil particulates.

6. In Section 7.7.2. of the RIR, DuPont compares the concentration of metals in sediment samples collected at the Facility to the concentration ranges of metals in sediments from across the United States. DuPont should determine the natural background levels of these metals in sediments collected from or as close as possible to the Facility and compare these concentrations to those in sediment samples from impacted areas at the Site.

7. In Section 7.7. and Table 25, DuPont summed the concentration of individual PAHs and then used this total number when determining the Hazard Quotient (HQ) for PAHs in sediment. DuPont should determine the HQ for each individual PAH separately. In addition, as part of the ecological evaluation process, DuPont used averages of constituent concentrations in sediment sampled from Lake DERA, DERA Creek, and the Little River to screen contaminants. Due to the distance between sampling locations and differences in sample environments, DuPont should not use the average value from all of these areas in the screening process. Reevaluating the data using individual PAHs and not using the averaged values indicates additional sediment sampling is necessary to fully evaluate the ecological risk in DERA Creek and Lake DERA. DuPont should develop a sediment sampling plan to fully evaluate the ecological risk from contaminated sediments.

   In addition, Polychlorinated Biphenyls (PCBs) were detected during soil sampling at the Facility. Although EPA Region 4 is overseeing Corrective Action related to the PCB contamination, comment 12 of the September 24, 2014 letter from the HWS to DuPont states that analysis of sediment samples for the presence of PCBs may be required if PCBs were detected in soil samples collected during the RI. DuPont may want to include PCB analysis in the next round of sediment sampling to prevent having to return to the site for additional sediment sample collection potentially requested by EPA.

8. The RIR indicates surface water samples were collected at or just below the surface of Lake DERA. The RIR also indicates contamination was detected above residential standards in

several sediment samples and above industrial standards in one sediment sample collected from Lake DERA. Although the likelihood of an individual coming into significant contact with sediment is minimal, DuPont should collect surface water samples from the water column just above the bottom of Lake DERA in the area(s) of sediment contamination and should collect additional sediment samples from Lake DERA to fully evaluate the ecological risk in Lake DERA. DuPont should also consider the potential effect sediment contamination would have on fish populations in Lake DERA and whether tissue samples are appropriate to fully evaluate risk to potential receptors.

Additional Comments for Remedial Investigation Report,
Site Specific Risk Levels, and the Remedial Action Plan
Former DuPont Brevard Facility
EPA ID No. NCD 003 152 329

a. In Section 4.2. of the Remedial Investigation Report (RIR), DuPont states Remedial Levels (RLs) were developed so soil concentrations are "... protective of potential groundwater receptors (Little River)..." As indicated in previous correspondence (see August 21, 2014 NCDENR comments to DuPont, for example) the HWS considers DERA Creek a receptor for discharge of contaminated groundwater at the Facility. DuPont must include DERA Creek and not the Little River as the receptor when calculating site specific groundwater RLs (and therefore site specific soil RLs) for the site.

b. Based on figures provided in the RIR and in previous discussions about potential future site uses, areas near the former manufacturing area may be utilized for vehicle and motorcycle training. If areas to be utilized for this and other training do not have a permanent cover of asphalt, concrete or other similar surface, DuPont should revise the soil ingestion rate up from 100 mg/day to 330 mg/day when calculating site specific RLs due to the amount of soil that will be suspended in air due to disturbance by vehicles.

c. Benzo(a)anthracene is considered a volatile compound. DuPont should consider a volatilization factor when calculating a site specific RL for this constituent.

d. In Table 12 of the RIR, DuPont uses a contact fraction of 0.25 as an assumption when calculating the remediation goals for trail users. DuPont should provide details as to how this contact fraction number was established.

e. Based on data and calculations provided, trail user is the most restrictive standard that would be applied throughout the site. Any area of the site where contaminants are above the RL that was calculated based on trail user exposure should be clearly identified and either remediated or restricted by a mechanism that can be demonstrated to be adequate to protect against any use that could cause exposure above the calculated acceptable risk concentration.

f. DuPont has calculated RLs based on an increased cancer risk of 1×10^{-4} for individual hazardous constituents. However, as multiple carcinogens have been identified DuPont must calculate RLs based on no greater than a 1×10^{-5} increased risk (and HI = 1) due to the additivity effect of multiple carcinogens.

DuPont Corporate Remediation Group
6324 Fairview Road
Charlotte, NC 28210
Tel. (704) 362-6630

August 31, 2015

Mr. Mark Wilkins
North Carolina Department of Environment and Natural Resources
NC Hazardous Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

RE: Response to NCDENR Comments on the Remedial Investigation Report
Former DuPont Brevard Facility
Cedar Mountain, North Carolina
NCDENR RCRA Permit No. NCD 003 152 329

Dear Mr. Wilkins:

DuPont received your letter dated July 30, 2015 containing comments on the *Remedial Investigation Report* that was submitted to the Department on May 6, 2015. As an initial response, DuPont and various representatives of the Department met in Raleigh on August 24, 2015 to discuss the comments as well as to introduce new technical resources that will be assisting DuPont moving forward.

It became clear that additional evaluation of the existing data would aide in the identification of remaining data gaps necessary to satisfactorily complete the investigation and provide sufficient information to make final remedial decisions. To that end, DuPont agreed to re-evaluate the existing information (in context of the Department's comments) and then prepare a detailed response that will outline a proposed scope of additional activities to be conducted to ensure the development of an approvable final investigation report.

As discussed in the meeting, DuPont believes it will be important to then hold a follow up, face-to-face meeting with the Department and representatives of the Department of Agriculture to discuss the remaining data gaps, review DuPont's proposed responses, and agree on an acceptable and efficient path forward. DuPont also believes it would be productive to conduct this meeting at the site to aide in discussions related to possible sampling locations, areas for potential future use restrictions, and other physical area-related concerns (e.g., adequate waste area covers, SWMU 17 investigation strategies, etc.).

Ideally it would be helpful to conduct this meeting before the broader, upper management DuPont Brevard meeting currently scheduled for September 23, 2015 in Raleigh. However,

subsequent discussions with my new team indicates this may not be possible, especially given DuPont's desire for the meeting to be held at the site and the difficulties finding open travel dates for the preferred attendance list. I'm currently polling my team members for potential meeting dates and will forward a list of times that will work for DuPont.

If you have any questions or comments related to any aspect of this project, please do not hesitate to contact me at (704) 362-6626 or jamie.a.vanbuskirk@dupont.com. Thank you for your prompt response and thoughtful comments on our recent submittal.

Sincerely,

Jamie VanBuskirk
Project Director
DuPont Corporate Remediation Group

Cc: Mr. Joe Hudyncia – North Carolina Department of Agriculture
Tracy Ovbey – Parsons Environment and Infrastructure Group
File

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DuPont Engineering

April 1, 2016

Mr. Mark Wilkins
Hazardous Waste Section
Division of Waste Management
North Carolina Department of Environmental Quality
217 W. Jones St.
1646 Mail Service Center
Raleigh, NC 27699-1646

Re: Response to NCDEQ Comments on the Remedial Investigation Report
Former DuPont Brevard Facility
Cedar Mountain, North Carolina
NCDEQ RCRA Permit No. NCD 003 152 329

Dear Mr. Wilkins:

The purpose of this letter is to formally respond to North Carolina Department of Environmental Quality's (NCDEQ's) comments regarding DuPont's Former DuPont Brevard Facility Remedial Investigation Report (RIR), which was submitted to NCDEQ on May 6, 2015. NCDEQ's comments were communicated in a letter dated July 30, 2015 and during two subsequent meetings with NCDEQ and DuPont representatives. DuPont's responses to NCDEQ comments (as stated in the July 30, 2015 letter) are presented in the attached table.

We look forward to receiving your approval of these responses as quickly as practicable as we are trying to transfer the Brevard property to the State of North Carolina before the end of 2016.

Please do not hesitate to call me at (704) 362-6626 or email me at jamie.a.vanbuskirk@dupont.com with any questions you may have. I would be happy to set up a call to discuss our responses with you.

Sincerely,

Jamie VanBuskirk
Project Director
Corporate Remediation Group

cc: Bill Yarborough, NC Department of Agriculture & Community Services
Tracy Ovbey, Parsons
Brad Grimsted, PIONEER Technologies Corporation

Enclosures:

Figure 1: DSRF Visitor Center Samples
Figure 2: Proposed Surface Water and Sediment Sample Locations
Figure 3: Soil Cover Verification
Figure 4: Soil Concentrations Compared to Protection of DERA Creek RLs
Table 1: Lake DERA Average Sediment Concentrations Compared to Ecological and Human Health Criteria

Response to NCDEQ Comments on the Remedial Investigation Report

	NCDEQ Comment	DuPont Response
1.	DuPont should install a minimum of two (2) monitoring wells just east of the DuPont State Forest (DSF) Visitor Center. One of the wells should be screened across the water table. Another well should be screened at the top of bedrock. If bedrock is encountered prior to encountering the water table, DuPont should attempt to screen a well(s) at the first water bearing fracture encountered in bedrock. The purpose of these wells is to help determine the extent of groundwater contamination north of Solid Waste Management Unit (SWMU) 17.	DuPont does not believe conducting additional groundwater monitoring east of the DuPont State Recreational Forest (DSRF) Visitor Center is warranted. Based on the future land use plans provided by the State of North Carolina (State), surficial aquifer (shallow) groundwater (i.e., 13 to 78 feet below ground surface [bgs]) will not be used in the future. The only structures in this area (a public restroom and the Aleen Steinberg Center) are serviced with potable water from a nearby bedrock aquifer "deep well" (see Figure 1). Possible impacts to groundwater from SWMU 17 are removed prior to use by a granulated activated carbon treatment system installed and maintained by DuPont at the Aleen Steinberg Center. Surface water samples collected from seeps located downgradient of SWMU 17 did not indicate any adverse impacts (Parsons 2009).[1] During DuPont's discussions with NCDEQ during a December 2, 2015 meeting, it became apparent that NCDEQ is concerned with the potential for vapor intrusion into the Aleen Steinberg Center. Although vapor intrusion was not of concern from potentially contaminated shallow groundwater based on the results of soil gas samples collected around the Aleen Steinberg Center, and future land use plans provided by the State indicate that no new buildings will be constructed in this area, DuPont understands this concern and will work with NCDEQ to create a scope of work (SOW) to address this issue including the installation of a sentinel well near the visitors center. In addition, DuPont is proposing to address the suspected contaminant source area at SWMU 17 through in-situ treatment remedial actions.
2.	Due to occasional detections of contaminants in samples collected from DERA Creek during historical surface water monitoring, DuPont should develop a surface water monitoring plan to collect samples quarterly for a one year period from DERA Creek. Due to the detection of contaminants above NC 2B standards, the monitoring plan should include sample collection from the seep area downgradient of the former WWTP polishing pond. The monitoring plan should include at least one sampling event during a period when surface water flow is typically at lower flow conditions based on historical information. In addition, as stated in Comment 12 of the September 25, 2014 letter from the HWS to DuPont, if Polycyclic Aromatic Hydrocarbons (PAHs) were detected in sediment samples collected during the RI, analysis of surface water for the presence of PAHs may be required. Since PAHs were detected in DERA Creek sediment, PAHs should be added to the list of analytes for surface water	Surface water sample concentrations collected during the Remedial Investigation were less than NC 2B standards (human health or aquatic life) and Ecological Screening Values (ESVs) with the following exceptions (see Section 5.3 of the RIR). • Iron concentrations in DERA Creek exceeded the NC 2B standard (aquatic life) in one location (SW-8); however, no exceedances were observed in locations sampled further downstream prior to DERA Creek's confluence with Little River. • Manganese concentrations were above the ESV in all locations in DERA Creek. Iron concentrations exceeded the NC 2B standard (aquatic life) in the SWMU 14 drainage ditch (ball field sample). • Vinyl chloride and iron concentrations exceeded the NC 2B standard and manganese exceeded the ESV in seep location SW-26. Based on these results, the potential for adverse ecological effects from Site surface

[1] Parsons. 2009. Phase II RCRA Facility Investigation Report. Former DuPont Brevard Facility. Cedar Mountain, North Carolina. HSWA Permit NCD003152329-R2. September 30.

Response to NCDEQ Comments on the Remedial Investigation Report

	NCDEQ Comment	DuPont Response
	samples collected during these quarterly monitoring events.	water is limited. In addition, surface water flow in DERA Creek originates from Lake DERA and is controlled by a weir. Therefore, the flow is not seasonal in nature. To confirm that the potential for adverse ecological effects from Site surface water is limited, DuPont will collect one round of surface water and co-located sediment samples to complete the characterization of surface water and sediment. The proposed sample locations are presented on Figure 2. The samples will be analyzed as follows: • The Lake DERA samples will be analyzed for metals and PAHs[2] • The DERA Creek samples will be analyzed for metals, PAHs, and PCBs. All PCB samples will be analyzed for Aroclors and 10% of samples will be analyzed for congeners. The samples that will undergo congener analysis will be determined once the Aroclor analyses are complete. • The seep sample will be analyzed for metals, PAHs, PCBs (Aroclors), and VOCs
3.	To provide a visual representation of areas of the site that are contaminated DuPont should develop figures that show: • location and extent of soil contamination found in samples collected at the 0 - 1 foot and 0-2 foot intervals that are above residential (unrestricted) remediation goals as listed in the Inactive Hazardous Sites Branch (IHSB) Preliminary Soil Remediation Goals (PSRG) Table; • location and extent of soil contamination found in samples collected at the 0 - 1 foot and 0 -2 foot intervals that are above industrial remediation goals as listed in the IHSB PSRG Table; • location and extent of soil contamination found in samples collected more than 2 feet below land surface that are above industrial remediation goals as listed in the IHSB PSRG Table; • location and extent of areas that must be remediated or must have restricted uses based on the calculated most restrictive proposed use of the site; • location and extent of areas that must have restricted uses due to potential vapor intrusion issues; • location and extent of areas of surface water contamination above NC 2B standards; • location and extent of sediment contamination where the recalculated Hazard Quotient (HQ) for ecological effects due to any constituent detected in the sediment is greater than 1; and,	These figures were included in Appendix A and B of the Conceptual RAP.

[2] No PCB sampling is proposed for Lake DERA since no manufacturing related activities occurred in the vicinity. In addition, it is hydraulically upgradient of any potential source areas.

Response to NCDEQ Comments on the Remedial Investigation Report

	NCDEQ Comment	DuPont Response
	• the location and extent of groundwater contamination above NC 2L standards in the surficial and bedrock aquifers. **This information is not only necessary to identify contaminated areas and their extent but will be critical in development of any Land Use Restrictions (LURs) established at the site.	
4.	In Sections 5.1.2. and 7.5.2., DuPont indicates that a two-foot soil cover is not present over all areas of contamination at the site. DuPont should provide a figure that locates any areas at the site where surface covers are insufficient.	During the final field investigation at the Site, soil cores were collected from SWMU 13, SWMU 16, and SWMU 19 as well as SWMUs 4, 12, 15, and 18/20 (see Section 5.1.2 of the RIR). The results of the final field investigation indicated that, despite the presence of some miscellaneous debris, two-foot soil covers were intact at these SWMUs (see Figure 3). The miscellaneous debris observed in the soil cores were from the following three SWMUs: SWMU 12 B (Former North Landfill): Green turquoise plastic was found in one of six soil cores (SWMU-12B/C-CB-3). SWMU 15 (Former Silicon Disposal Area): Plastic, high purity silicone fragments, and/or other materials were found in three of 10 soil cores (SWMU-15-SS-1, SWMU-15-SS-2, SWMU-15-SBS-1). SWMU 18 (Former Disposal Area 8 for evaporation basin wastewater containing zinc chloride): PVC pipe, a soda can, pipe jacket with Tedlar coating, and a small piece of metal were found in one of three soil cores (SWMU-18B-CB-1).
5.	In Section 7.5.1. and 7.5.2. of the RIR, DuPont states "Potentially complete exposure pathways for this receptor may include ... inhalation of soil-derived particulates." When considering these potential pathways, DuPont should include inhalation of volatile constituents present in the soil along with inhalation of soil particulates.	The inhalation of volatile constituents was included in the RIR. As shown on Table 12 of Appendix C, the inhalation pathway was evaluated for both particulates and volatiles.
6.	In Section 7.7.2. of the RIR, DuPont compares the concentration of metals in sediment samples collected at the Facility to the concentration ranges of metals in sediments from across the United States. DuPont should determine the natural background levels of these metals in sediments collected from or as close as possible to the Facility and compare these concentrations to those in sediment samples from impacted areas at the Site.	While determining site-specific background concentrations in rivers/streams would be helpful for evaluating whether or not detected metal concentrations are consistent with what is present naturally, there is no reason to develop site-specific background concentrations for metals at this time since they are not of concern at the Site. Metal concentrations (iron, lead, and manganese) exceeded the screening criteria at only four sediment sample locations (SSP14-SED-09, SSP14-SED-10, SSP14-SED-26, and SSP14-SED-33; see Table 25 in RIR). Iron and manganese are naturally-occurring constituents that are not associated with any former manufacturing processes. The sample where the lead concentration exceeded the criterion (SSP14-SED-33) was collected in Lake DERA. It was the only sample (out of 18 samples) from Lake DERA with a concentration that exceeded the ESV and the concentration was only 40% higher than the ESV.

Response to NCDEQ Comments on the Remedial Investigation Report

NCDEQ Comment		DuPont Response
7.	In Section 7.7. and Table 25, DuPont summed the concentration of individual PAHs and then used this total number when determining the Hazard Quotient (HQ) for PAHs in sediment. DuPont should determine the HQ for each individual PAH separately. In addition, as part of the ecological evaluation process, DuPont used averages of constituent concentrations in sediment sampled from Lake DERA, DERA Creek, and the Little River to screen contaminants. Due to the distance between sampling locations and differences in sample environments, DuPont should not use the average value from all of these areas in the screening process. Reevaluating the data using individual PAHs and not using the averaged values indicates additional sediment sampling is necessary to fully evaluate the ecological risk in DERA Creek and Lake DERA. DuPont should develop a sediment sampling plan to fully evaluate the ecological risk from contaminated sediments. In addition, Polychlorinated Biphenyls (PCBs) were detected during soil sampling at the Facility. Although EPA Region 4 is overseeing Corrective Action related to the PCB contamination, comment 12 of the September 24, 2014 letter from the HWS to DuPont states that analysis of sediment samples for the presence of PCBs may be required if PCBs were detected in soil samples collected during the RI. DuPont may want to include PCB analysis in the next round of sediment sampling to prevent having to return to the site for additional sediment sample collection potentially requested by EPA.	DuPont will collect one round of surface water and co-located sediment samples to complete the characterization of surface water and sediment. The proposed sample locations are presented on Figure 2. The samples will be analyzed as follows: • The Lake DERA samples will be analyzed for metals and PAHs[3] • The DERA Creek samples will be analyzed for metals, PAHs, and PCBs. All PCB samples will be analyzed for Aroclors and 10% of samples will be analyzed for congeners. The samples that will undergo congener analysis will be determined once the aroclor analyses are complete. • The seep sample will be analyzed for metals, PAHs, PCBs, and VOCs
8.	The RIR indicates surface water samples were collected at or just below the surface of Lake DERA. The RIR also indicates contamination was detected above residential standards in several sediment samples and above industrial standards in one sediment sample collected from Lake DERA. Although the likelihood of an individual corning into significant contact with sediment is minimal, DuPont should collect surface water samples from the water column just above the bottom of Lake DERA in the area(s) of sediment contamination and should collect additional sediment samples from Lake DERA to fully evaluate the ecological risk in Lake DERA. DuPont should also consider the potential effect sediment contamination would have on fish populations in Lake DERA and whether tissue samples are appropriate to fully evaluate risk to	The potential risks to fish[4] and recreators being exposed to Lake DERA sediment were evaluated by comparing average sediment constituent concentrations in Lake DERA to ecological screening values (ESVs) or background concentrations and trail user human health screening levels (see Table 1). Only three PAH constituent concentrations exceeded ESV or background criteria and the maximum exceedance was only two times the criterion. Thus the potential risk to fish in Lake DERA is low and does not warrant further evaluation (tissue sampling). In addition, the average sediment constituent concentrations were all less than the Trail User remedial levels (RL) indicating that the potential risk to future recreators is low.[5] However, additional sediment and co-located surface water samples are proposed in Lake DERA to characterize metal and PAH concentrations (see Figure 1). Surface water

[3] No PCB sampling is proposed for Lake DERA since no manufacturing related activities occurred in the vicinity. In addition, it is hydraulically upgradient of any potential source areas.

[4] Lake DERA is shallow and contains some emergent vegetation which serves as habitat for young-of-the-year and adult littoral fish species. Overall, fish density and diversity are low (see Section 7.4.1 of the RIR).

[5] The trail user exposure scenario is protective of future use scenarios. Applying this scenario to sediment assumes that a trail user spends all of their time in the lake in contact with sediment which is unlikely.

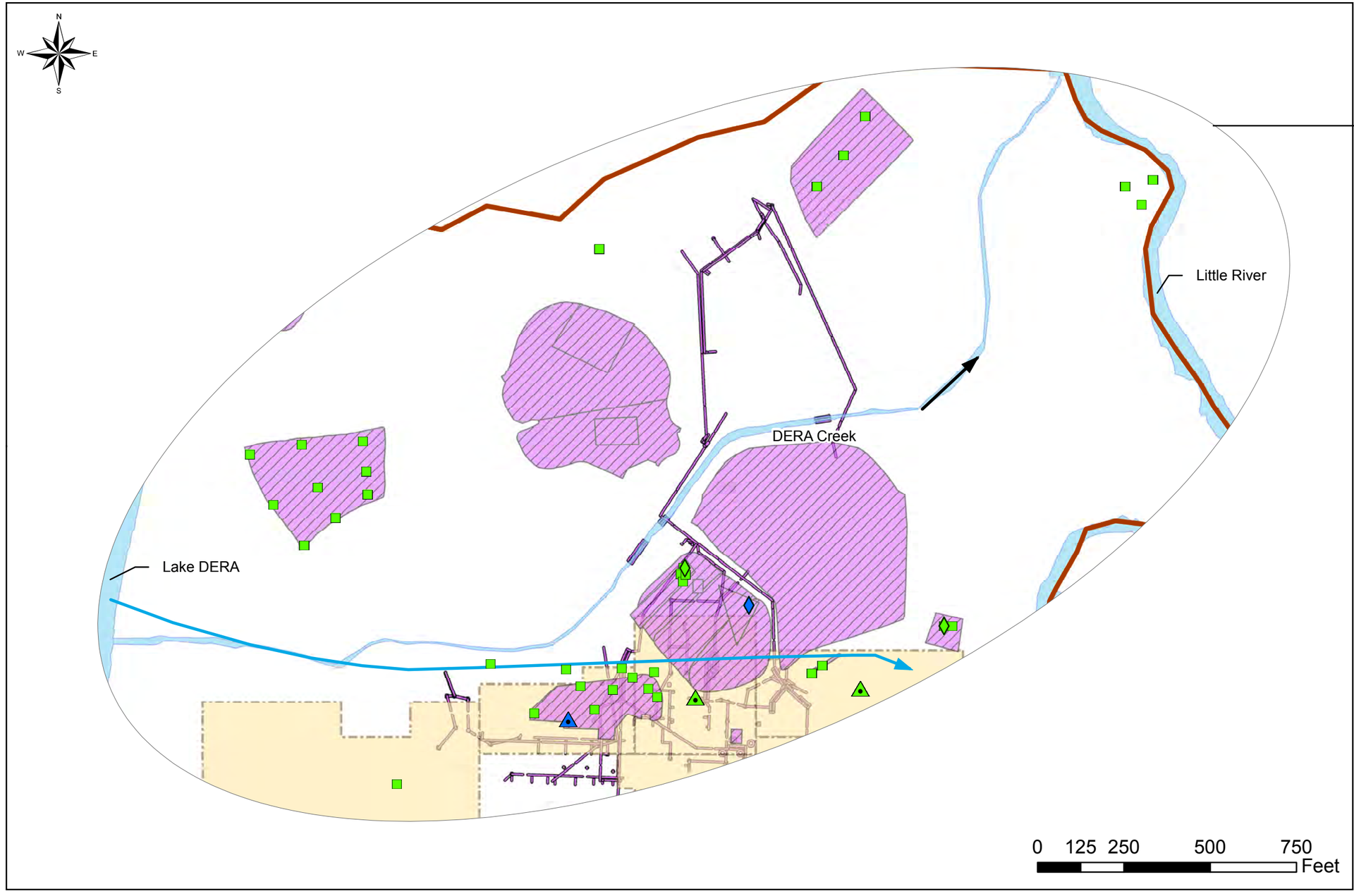
Response to NCDEQ Comments on the Remedial Investigation Report

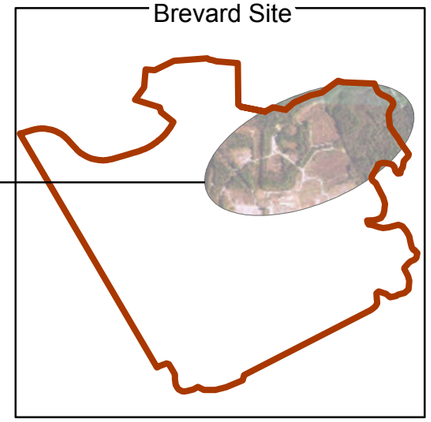
	NCDEQ Comment	DuPont Response
	potential receptors.	samples will be collected just above the bottom of Lake DERA.
a.	In Section 4.2. of the Remedial Investigation Report (RIR), DuPont states Remedial Levels (RLs) were developed so soil concentrations are"... protective of potential groundwater receptors (Little River)... " As indicated in previous correspondence (see August 21,2014 NCDENR comments to DuPont, for example) the HWS considers DERA Creek a receptor for discharge of contaminated groundwater at the Facility. DuPont must include DERA Creek and not the Little River as the receptor when calculating site specific groundwater RLs (and therefore site specific soil RLs) for the site.	DERA Creek was used as a receptor when evaluating groundwater data in the vicinity of DERA Creek. Maximum detected concentrations in groundwater monitoring wells adjacent to DERA Creek were compared to adjusted groundwater-to-surface water screening criteria (i.e., surface water screening criteria with an applied conservative dilution factor of 10 to account for groundwater to DERA Creek surface water interaction).[6] Only one constituent (barium) had a maximum detected groundwater concentration that exceeded the adjusted groundwater-to-surface water screening criteria. However, the average barium concentration was less than the adjusted groundwater-to-surface water screening criteria. In addition, barium has not been detected in any DERA Creek surface water sample. Therefore, the potential for constituents in groundwater to discharge into DERA Creek is not a concern. In addition, soil constituent concentrations protective of groundwater (RLs) were calculated based on the ACLs protective of DERA Creek. Soil concentrations in the vicinity of DERA Creek were compared to these criteria and the results are presented on Figure 4. Based on this evaluation, it is unlikely that constituent concentrations in soil will affect DERA Creek as the soil concentrations were less than RLs that are protective of DERA Creek. Soil constituent concentrations at two sample locations were above the RLs; however, they are located hydraulically downgradient of DERA Creek.
b.	Based on figures provided in the RIR and in previous discussions about potential future site uses, areas near the former manufacturing area may be utilized for vehicle and motorcycle training. If areas to be utilized for this and other training do not have a permanent cover of asphalt, concrete or other similar surface, DuPont should revise the soil ingestion rate up from 100 mg/day to 330 mg/day when calculating site specific RLs due to the amount of soil that will be suspended in air due to disturbance by vehicles.	The parking lot and the looping roads that will be used for the motorcycle and driving course have permanent covers in that they are paved. In addition, the current National Guard exposure scenario incorporates a particulate emission factor (PEF) which accounts for wind-borne dust.
c.	Benzo(a)anthracene is considered a volatile compound. DuPont should consider a volatilization factor when calculating a site specific RL for this constituent.	The RLs for the scenarios were recalculated using the current USEPA recommended VF. The effect of incorporating the VF into the exposure calculation to determine RLs was minimal in that the RL decreased by less than one percent. . For example, the National Guard RL changed from 31.6 (value in RIR [Appendix C, Table 13) to 31.3 mg/kg.

[6] Alternate concentration limits (ACLs) for groundwater concentrations protective of DERA Creek were presented in the RIR in Appendix C as part of the Response to NC DENR Comments dated August 21, 2014.

Response to NCDEQ Comments on the Remedial Investigation Report

NCDEQ Comment		DuPont Response
d.	In Table 12 of the RIR, DuPont uses a contact fraction of 0.25 as an assumption when calculating the remediation goals for trail users. DuPont should provide details as to how this contact fraction number was established.	For the trail user scenario it was assumed that a receptor will be using trails in the DSRF frequently in the summer months (5 days per week) and infrequently in the spring and fall months (2 days per week) for a total of 108 days/year for 26 years. The contact fraction of 0.25 reflects the amount of time that an individual is assumed to be at the Site and in contact with COPCs in surface soil. This is a conservative assumption since the Site is only a small portion of the DSRF and it is likely that trail users will visit and spend time in more noteworthy attractions of the DSRF such as High Falls.
e.	Based on data and calculations provided, trail user is the most restrictive standard that would be applied throughout the site. Any area of the site where contaminants are above the RL that was calculated based on trail user exposure should be clearly identified and either remediated or restricted by a mechanism that can be demonstrated to be adequate to protect against any use that could cause exposure above the calculated acceptable risk concentration.	Areas of the Site where soil concentrations are greater than the trail user RLs are identified and addressed in the RAP.
f.	Calculate RLs based on no greater than a 1X10-5 increased risk (and HI = 1) due to the additivity effect of multiple carcinogens.	Cumulative risks at individual sample locations were evaluated and are presented in the RAP.





Legend

- Site Boundary
- Lake or Stream
- SWMUs and AOCs
- ISM Decision Units
- Generalized Surficial Aquifer Flow Direction
- DERA Creek Flow Direction

Sample Locations

- EF ≤ 1
- 1 < EF ≤ 10
- 10 < EF ≤ 100
- EF > 100
- Soil Samples 0-15 ft bgs
- ISM Soil Samples
- Waste Soil 0-15 ft bgs

Notes:
- ft bgs: feet below ground surface
-ISM: Incremental Sampling Methodology
-Exceedance factors (EFs) were calculated for all detected constituents by dividing soil constituent concentrations by the soil-to-DERA Creek Remedial Levels (RLs) to determine where (and by how much) constituent concentrations exceeded the RLs
- Symbols depict the maximum constituent EF at a location.

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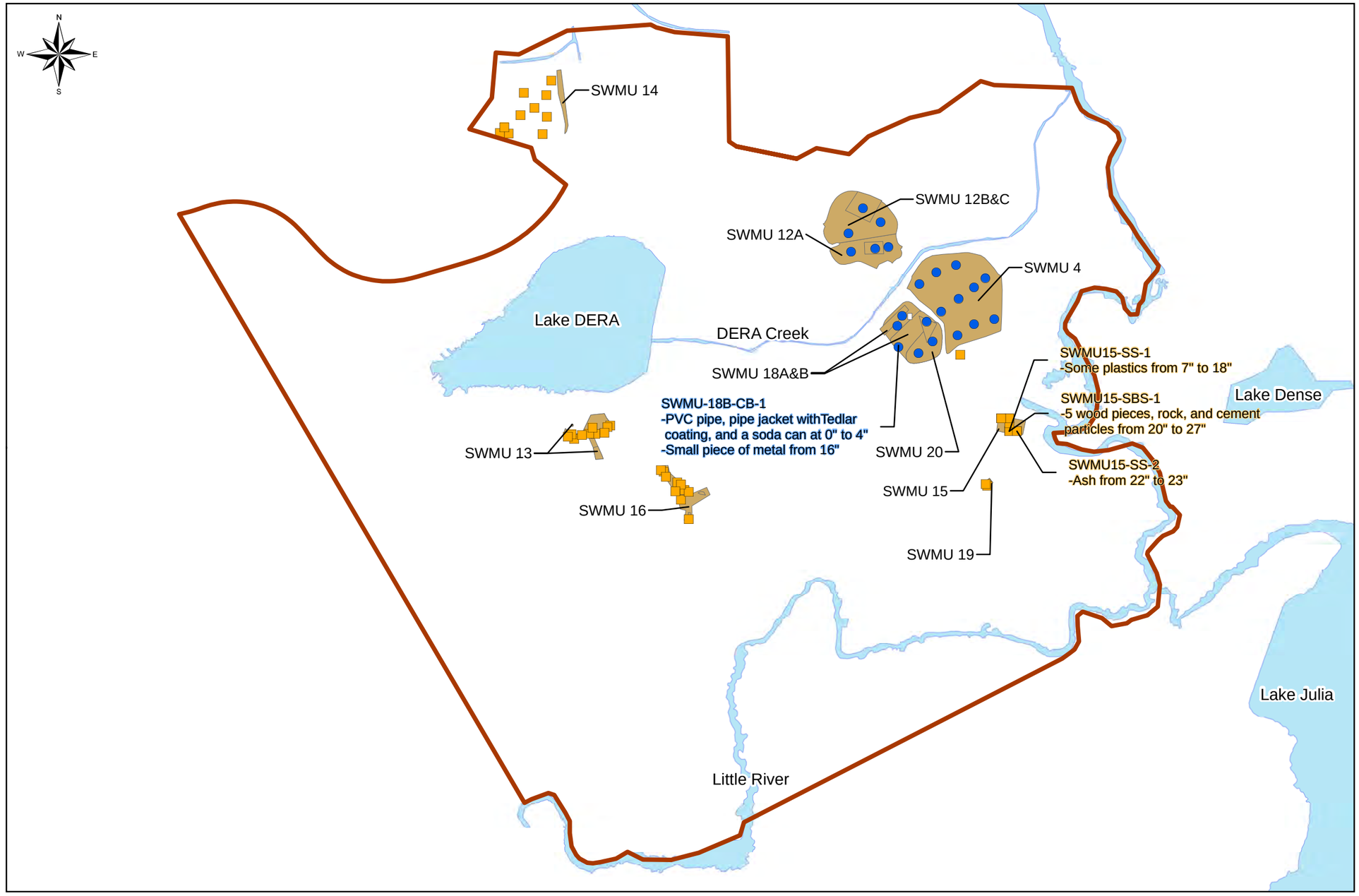
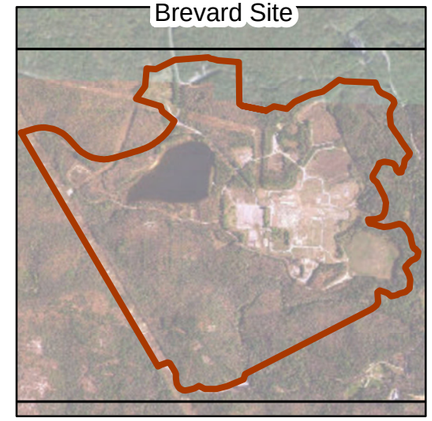
Soil Concentrations Compared to Protection of DERA Creek RLs
Response to NCDEQ Comments - Comment a
Brevard Site
Cedar Mountain, North Carolina

Figure 4





Legend

- Site Boundary
- Lake or Stream
- SWMUs with Adequate Soil
- Discrete Soil Sample Locations
- Cover Verification Boring

0 250 500 1,000 1,500
Feet

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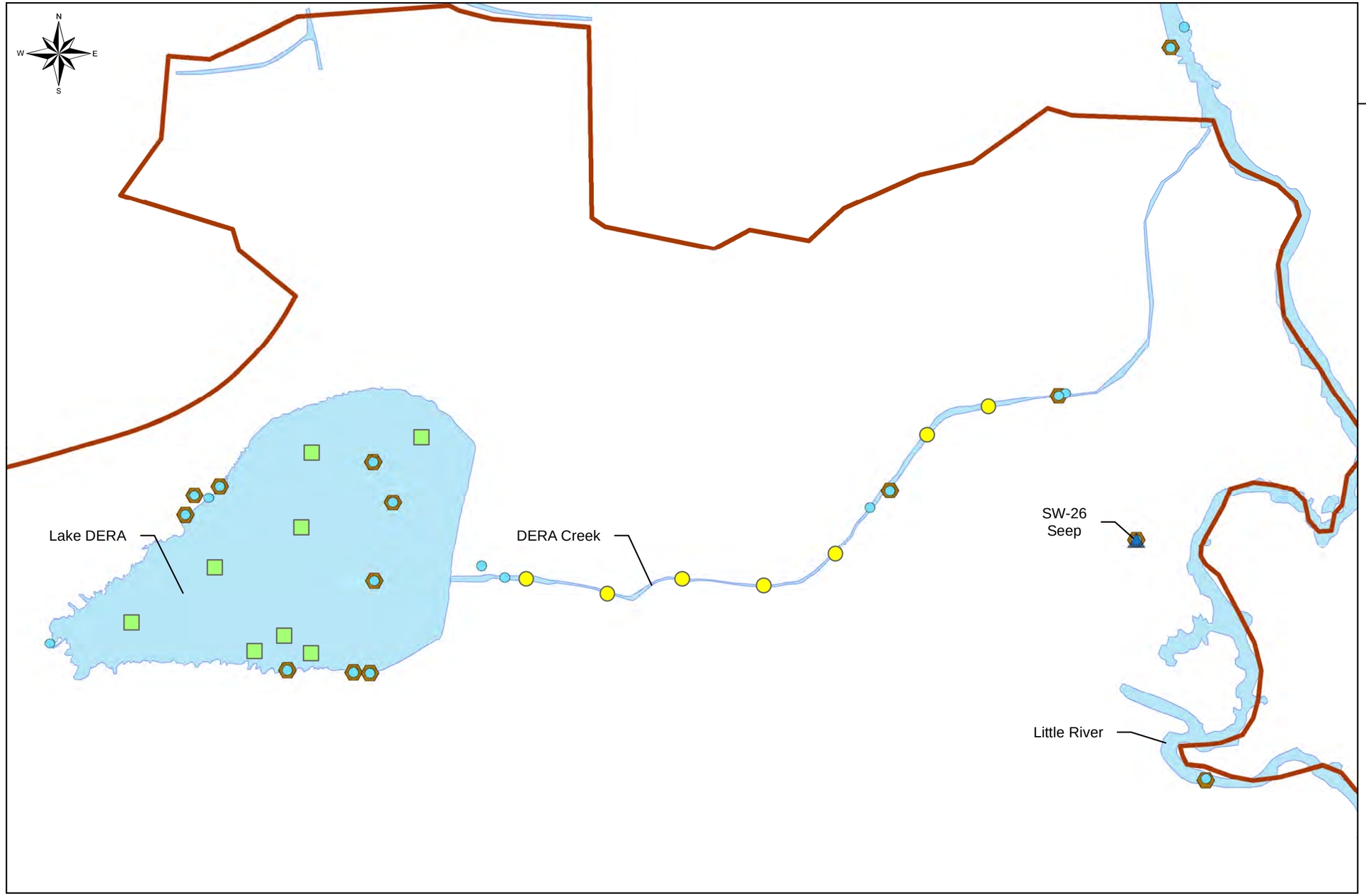
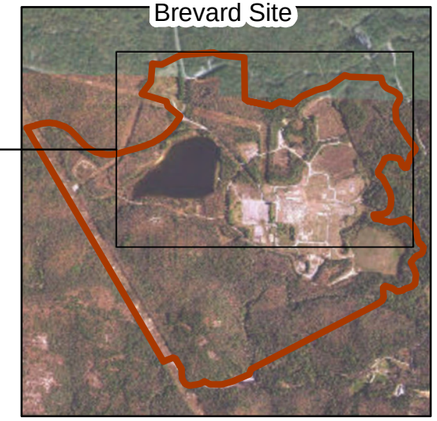
Soil Cover Verification
Response to NCDEQ Comments - Comment 4
Brevard Site
Cedar Mountain, North Carolina

Figure 3





Legend

- Site Boundary
- Lake or Stream

Previous Surface Water and Sediment Sample Locations

- Surface Water
- Sediment

Proposed Surface Water and Sediment Sample Locations

- Metals and PAHs
- Metals, Dowtherm Constituents, PAHs, and PCBs
- Metals, PAHs, PCBs, and VOCs

Note:
Sediment samples will also be analyzed for total organic carbon and grain size.

0 150 300 600 900 Feet

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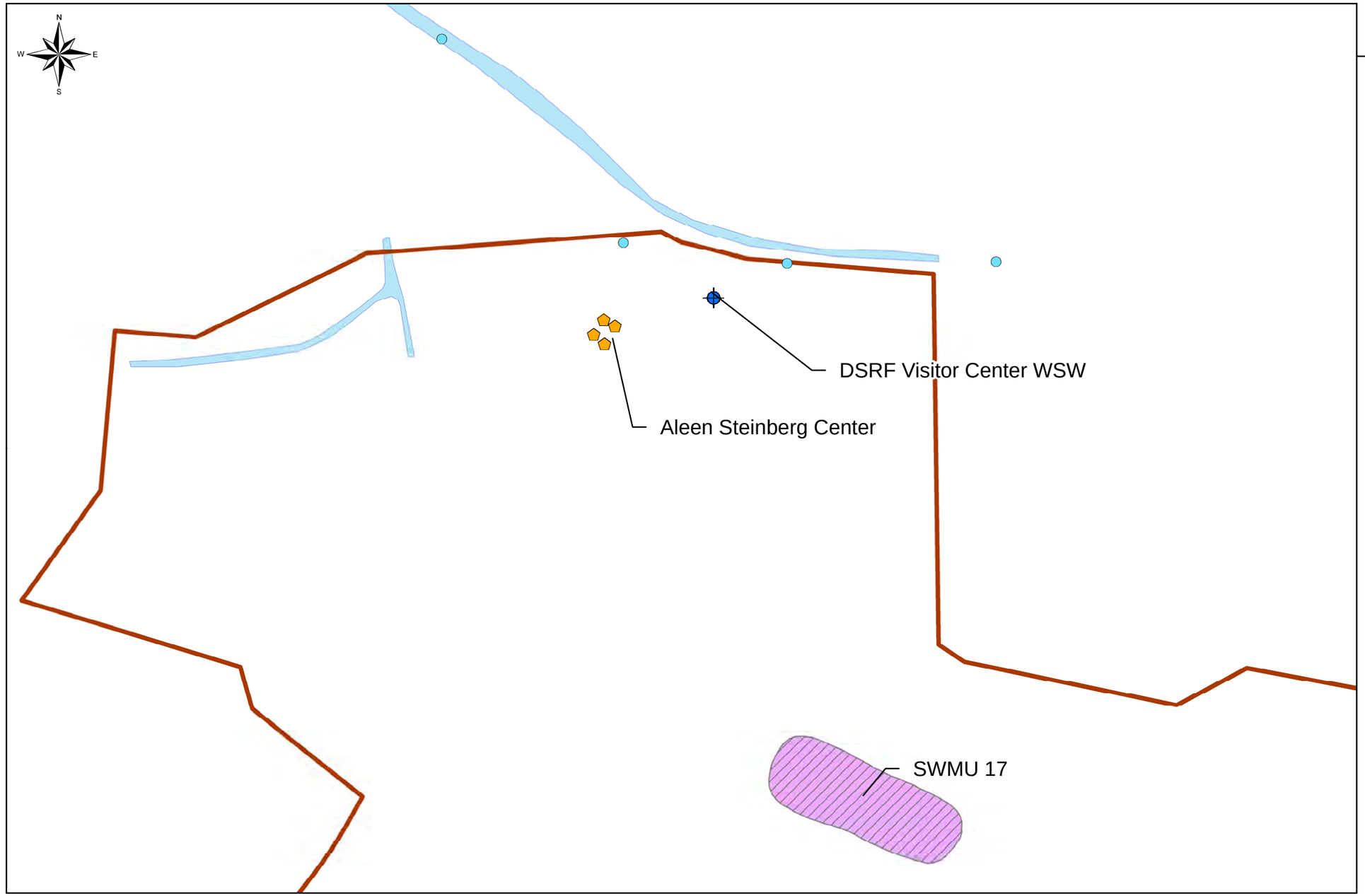
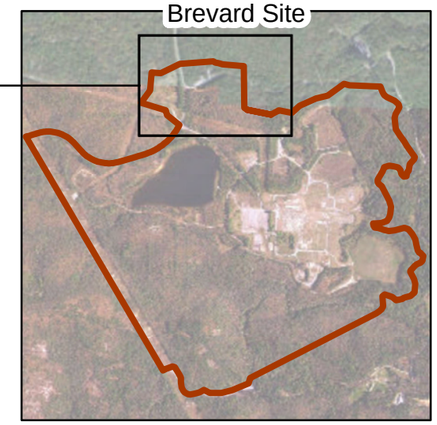
Proposed Surface Water and Sediment Sample Locations
Response to NCDEQ Comments - Comments 2, 7, and 8
Brevard Site
Cedar Mountain, North Carolina

Figure 2

Document Path: G:\Projects\Brevard\Maps\2016\RAP Response to NCDEQ Comments\Fig_2_Additional_Sed_SW_RTC.mxd; Author: VN; Date Saved: 3/23/2016





Legend

- Site Boundary
- Lake or Stream
- SWMU 17

Investigation Samples by Medium

- Seep
- Groundwater WSW
- Soil Gas

Notes:
-DSRF: DuPont State Recreational Forest
-WSW: Water Supply Well

0 75 150 300 450 Feet

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DSRF Visitor Center Samples
Response to NCDEQ Comments - Comment 1
Brevard Site
Cedar Mountain, North Carolina

Figure 1

Table 1: Lake DERA Average Sediment Concentrations Compared to Ecological and Human Health Criteria

Constituent	Number of Samples	Average (mg/kg)	Ecological or Background			Human Health or Background		
			Criterion (mg/kg)	Basis[1]	Exceedance Factor[2]	Criteria (mg/kg)	Basis[3]	Exceedance Factor
Antimony (metallic)	9	0.091	12	Sediment ESV	0.0076	406	Trail User RL	0.00022
Arsenic, Inorganic	9	1.7	7.2	Sediment ESV	0.24	4.8	Soil Background	0.36
Barium	9	34	189	Sediment ESV	0.18	Not a COPC	--	
Beryllium and compounds	9	0.80	2.7	Soil Background	0.30	Not a COPC	--	
Cadmium	9	0.071	1.0	Sediment ESV	0.071	Not a COPC	--	
Chromium, Total	9	5.7	52	Sediment ESV	0.11	Not a COPC	--	
Cobalt	9	1.8	50	Sediment ESV	0.035	304	Trail User RL	0.0058
Copper	9	3.5	19	Sediment ESV	0.19	Not a COPC	--	
Iron	9	8,178	20,000	Sediment ESV Refined	0.41	Not a COPC	--	
Lead and Compounds	9	13	36	Sediment ESV Refined	0.36	Not a COPC	--	
Manganese	9	114	460	Sediment ESV Refined	0.25	Not a COPC	--	
Mercury (elemental)	9	0.021	0.13	Sediment ESV	0.16	Not a COPC	--	
Selenium	9	0.49	0.50	Sediment Background	0.99	Not a COPC	--	
Thallium (Soluble Salts)	9	0.19	1.2	Soil Background	0.17	10	Trail User RL	0.019
Tin	9	3.2	8.4	Soil Background	0.39	Not a COPC	--	
Vanadium	9	18	57	Sediment ESV	0.32	5,060	Trail User RL	0.0036
Zinc and Compounds	9	25	124	Sediment ESV	0.20	Not a COPC	--	
2-Methylnaphthalene	9	0.0067	0.33	Sediment ESV	0.020	Not a COPC	--	
Acenaphthene	9	0.037	0.33	Sediment ESV	0.11	Not a COPC	--	
Acenaphthylene	9	0.0041	0.33	Sediment ESV	0.012	Not a COPC	--	
Anthracene	9	0.087	0.33	Sediment ESV	0.26	Not a COPC	--	
Benz[a]anthracene	9	0.26	0.33	Sediment ESV	0.77	20	Trail User RL	0.013
Benzo(g,h,i)perylene	9	0.16	0.17	Sediment ESV	0.93	Not a COPC	--	
Benzo[a]pyrene	9	0.23	0.33	Sediment ESV	0.69	2.0	Trail User RL	0.12
Benzo[b]fluoranthene	9	0.33	10	Sediment ESV	0.032	20	Trail User RL	0.017
Benzo[k]fluoranthene	9	0.12	0.24	Sediment ESV	0.51	198	Trail User RL	0.00062
Chrysene	9	0.24	0.33	Sediment ESV	0.73	1,980	Trail User RL	0.00012
Dibenz[a,h]anthracene	9	0.045	0.033	Sediment ESV	1.4	2.0	Trail User RL	0.023
Fluoranthene	9	0.53	0.33	Sediment ESV	1.6	Not a COPC	--	
Fluorene	9	0.036	0.33	Sediment ESV	0.11	Not a COPC	--	
Indeno[1,2,3-cd]pyrene	9	0.14	0.20	Sediment ESV	0.71	20	Trail User RL	0.0072
Naphthalene	9	0.0093	0.33	Sediment ESV	0.028	1,600	Trail User RL	0.0000058
Phenanthrene	9	0.34	0.33	Sediment ESV	1.0	Not a COPC	--	
Pyrene	9	0.42	0.20	Sediment ESV	2.1	Not a COPC	--	
Dibenzofuran	9	0.028	0.45	Sediment ESV	0.062	Not a COPC	--	
Acetone	9	0.059	60	Sediment ESV Refined	0.00099	Not a COPC	--	
Carbon Disulfide	9	0.0014	0.024	Sediment ESV	0.058	Not a COPC	--	
Methyl Ethyl Ketone	9	0.0056	0.042	Sediment ESV	0.13	Not a COPC	--	
Toluene	9	0.0011	1.2	Sediment ESV	0.00091	Not a COPC	--	

Notes:
Only detected constituents are included in this table
ESV: Ecological Screening Values

[1] See RIR Tables 22 and 25 for basis of ecological sediment criteria.

[2] Exceedance Factor = Average Constituent Concentration ÷ Criterion. Exceedance factors greater than 1 are highlighted in orange and indicate the concentration exceeds the criterion.

[3] Human health screening criteria are based on a hazard quotient = 1 or a cancer risk = 1.0E-05. Remedial Levels (RLs) were not calculated for constituents that were not identified as COPCs in the RIR.

From: Wilkins, Mark [mailto:mark.wilkins@ncdenr.gov]
Sent: Tuesday, May 10, 2016 3:20 PM
To: VANBUSKIRK, JAMES A <Jamie.A.Vanbuskirk@dupont.com>
Cc: Mccarty, Bud <bud.mccarty@ncdenr.gov>; Burch, Brent <brent.burch@ncdenr.gov>; Mort, Sandra L <sandy.mort@ncdenr.gov>
Subject: RIR and RAP

Jamie,
You asked the HWS to let you know if there were any additional comments on the RIR or the RAP, the HWS comments on the RIR or the RAP, DuPont's response to comments for the RIR or the RAP, or any subsequent discussions that were had. Below are our comments. Let me know if there needs to be further discussion to clarify either of these issues.
Mark

a. HWS Comment 1 to the Conceptual RAP dealt with caps/covers at SWMUs, particularly SWMU 13. In addition, a subsequent meeting between DA&CS and the HWS identified potential issues with the cover at SWMU 12. We believe both of these issues have been resolved in subsequent conversations between the HWS and DuPont. Evidence of adequate existing cover at SWMU 12 was provided. For SWMU 13, DuPont has asked the DA&CS to indicate what type of addition "protective measure" they would prefer in the SWMU 13 area.
b. HWS Comment 16 dealt with requirements for well abandonment at the Facility. In subsequent discussions between the HWS, DA&CS, DuPont, and NCNG it was agreed to not abandon 4 monitoring wells each at SWMU 11 and SWMU 17, the water supply wells at the Facility, and the wells at the DSFVS property

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