



File Code: 2720; 1900
Date: November 5, 2015

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., N.E., Room 1A
Washington, DC 20426

Dear Ms. Bose:

Subject: Comments Regarding Soils Surveys Conducted to Date
OEP/DG2E/Gas 4
Atlantic Coast Pipeline, LLC
Docket No. PF15-554

The Forest Service submits information concerning the soil surveys conducted by Atlantic Coast Pipeline, LLC (ACP) and/or its consultants for the Atlantic Coast Pipeline (ACP) Project (Docket No. PF15-554). The proposed project would cross National Forest System (NFS) lands in West Virginia and Virginia.

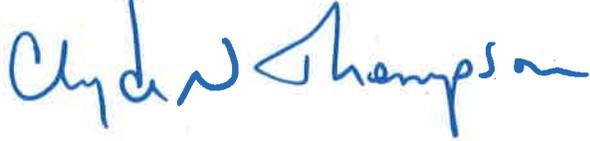
Though the Forest Service has not yet received final reports of soils surveys, information has come to our attention that discredits the results of any soils surveys conducted to date while also showing ACP failed to implement the Forest Service's protocols for surveys and requirements for qualifications of field personnel. Supporting information is detailed in the attachment to this letter which details a timeline of communications with ACP and its consultants, showing that the Forest Service provided protocol for the soils surveys and required qualifications of field personnel as early as February 23, 2015. The Forest Service continued to engage ACP in numerous discussions about soils surveys through the spring and summer, and again provided the protocol and required qualifications on October 2, 2015. ACP was undiligent in following the Forest Service's protocols and responding to the Forest Service's requests to review qualifications of field personnel. The attachment also shows that ACP and/or its consultants misrepresented who conducted the soils surveys.

In summary, the Forest Service cannot use the results of these soils surveys to evaluate project effects on NFS lands. Furthermore, the Forest Service recommends the Federal Energy Regulatory Commission (FERC) not utilize data from soils surveys conducted to date on NFS lands in the preparation of the environmental impact statement. We remain concerned that ACP identified its preferred route and filed an application with the FERC without first completing the soils and geology surveys. Results of soils and geology surveys should be considered in the process of route selection.



For questions or discussions, please contact Jennifer Adams, Special Project Coordinator, by phone at (540) 265-5114 or by email at jenniferpadams@fs.fed.us.

Sincerely,

A handwritten signature in blue ink that reads "Clyde Thompson". The signature is written in a cursive style with a long, sweeping tail on the "n" of "Thompson".

CLYDE THOMPSON
Forest Supervisor

DOCUMENTATION PROVIDED BY THE FOREST SERVICE REGARDING SOILS SURVEYS CONDUCTED TO DATE
Atlantic Coast Pipeline Project (Docket No. CP15-554)

This document develops a record and timeline of conversations held with Atlantic Coast Pipeline, LLC (ACP) and its contractors regarding the soils surveys conducted by ACP for the proposed Atlantic Coast Pipeline Project (ACP Project) that would cross the Monongahela National Forest (MNF) and George Washington Jefferson National Forests (GWJNF). This document includes information that is the basis for rejecting the results of ACP's soils surveys conducted to date, based on the disregard for the Forest Service's required protocol and qualifications for field personnel. More specifically, ACP failed to 1) follow the Forest Service's protocol; 2) select a qualified consultant as suggested by the Forest Service; and 3) allow the Forest Service to review resumes. ACP knowingly started soils surveys before the completion of the meeting with the Forest Service to discuss the proposed field methods thus showing that the Forest Service's comments and protocols were not implemented at the start of the soils surveys. ACP failed to provide resumes to the Forest Service for review despite numerous requests by the Forest Service. ACP also misrepresented the resume of one field personnel thus falsely attributing survey results as being collected by qualified field personnel, and misrepresented the Forest Service's requirements for protocols and qualifications of field personnel to its consultant, as identified by the person whose resume was misrepresented.

1. December 17, 2014—Stephanie Connolly, MNF Forest Soil Scientist, provided input to Todd Hess, MNF Realty Specialist/Special Use Manager. The input became the protocols and professional qualifications required for field personnel; the input became the document that has been provided to ACP and its consultants several times beginning on February 23, 2015. (See the protocols and professional qualifications required for field personnel in Appendix 1.)
2. February 20, 2015—Andrea Thornton, Natural Resources Group (NRG), contacted Stephanie Connolly, MNF Forest Soil Scientist, via email. (See the email string under item 3 below).
3. February 23, 2015—Ms. Connolly, MNF Forest Soil Scientist, provided the protocol for the surveys and professional qualifications required for field personnel as outlined in item 1 above.

From: Connolly, Stephanie -FS
Sent: Monday, February 23, 2015 10:02 AM
To: Andrea Thornton
Subject: RE: Atlantic Coast Pipeline Project

Andrea – Thank you for contacting me and thank you for the conversation. I am currently moving the request to share my input with your company. As soon as I have a response, I will follow up.



Stephanie J. Connolly
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From: Andrea Thornton [<mailto:andrea.thornton@nrg-llc.com>]
Sent: Friday, February 20, 2015 6:29 PM

To: Connolly, Stephanie -FS
Subject: Atlantic Coast Pipeline Project

Good Afternoon,

My name is Andrea Thornton and I work for Natural Resource Group. We are working on the FERC Application for the Atlantic Coast Pipeline Project. I was given your contact information from our project manager via Kent Karriker to discuss any potential soils resource concerns you may have in regards to the project. We are currently using SSURGO data for our soils analysis. Please let me know if you think this data is adequate for the Monongahela National Forest, or if you have a forest specific data set that we would be able to use.

Thanks and I look forward to working with you.

-Andrea



Andrea Thornton
andrea.thornton@nrq-llc.com
 (503) 525-5159
 Direct
 (503) 459-6864 Cell
 (503) 525-5155 Fax

From: Connolly, Stephanie -FS
Sent: Monday, February 23, 2015 10:53 AM
To: 'Andrea Thornton'
Subject: RE: Atlantic Coast Pipeline Project

Andrea - I have received permission to share this document with you.



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From: Andrea Thornton [<mailto:andrea.thornton@nrq-llc.com>]
Sent: Friday, February 20, 2015 6:29 PM
To: Connolly, Stephanie -FS
Subject: Atlantic Coast Pipeline Project

Good Afternoon,

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Thanks and I look forward to working with you.

-Andrea



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4. February 27, 2015—Via email, NRG acknowledged receipt of protocol and qualifications of field personnel, as outlined in item 1 above. NRG responded with questions. (See email string under item 5 below.)
5. March 3, 2015—Ms. Connolly, MNF Forest Soil Scientist, provided clarification to Ms. Thornton, NRG, via email regarding the context and sampling requirements for the Order 1 Soil Survey.

From: Connolly, Stephanie -FS
Sent: Tuesday, March 03, 2015 12:34 PM
To: Andrea Thornton
Subject: RE: Atlantic Coast Pipeline Project

Please see my responses below:



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From: Andrea Thornton [<mailto:andrea.thornton@nrq-llc.com>]
Sent: Friday, February 27, 2015 1:30 PM
To: Connolly, Stephanie -FS
Subject: RE: Atlantic Coast Pipeline Project

Hi Stephanie,

Thank you for passing along this guidance document and taking the time to speak with me earlier this week. I have a couple of questions regarding the data collection for the order 1 survey and available forest soils data.

- 1- Would the survey be required for the entire crossing of the MNF, or are there specific areas of concern that could be focused on for the carbon stocks and soil chemistry assessments for base poor soils?

The initial assessment would be required for the entire crossing of the MNF as defined by the area that ACP has selected as the boundary. As a result of that initial assessment, ACP would determine where soil disturbance would occur as this is where the soil resource would be affected; however if there are indirect effects from activities that need to account for the soil resource upslope or downslope of that activity then that information needs to be accounted for as well – such as slope, slippage potential, hydrology, etc.

The soil chemistry question is really limited to nutrient poor soils that are at moderate to high risk from disturbance. This issue is governed by the geochemistry of the geology. Therefore, identifying those geologies up front could limit the need for where the soil chemistry assessments are conducted. Do you need protocols for assessing this? We use tradition soil sampling techniques as described by USDA –NRCS Soil Survey and the University of Maine Soil Testing Lab Forest Soils Protocols. It is key that the methods be for forest soils and not agricultural soils.

- 2- You mentioned on the phone that the forest is in the process of updating/creating a soils layer but that it will not be available for us to use in our analysis. Is this because it is incomplete or only in hard copy format? No this is because it has not been posted to USDA-NRCS Web Soil Survey which is the legal access point for all soils data for official soil survey reports. Therefore, you will have to work with USDA-NRCS to determine if the soils layer you obtain for the corridor that ACP has highlighted is the most current information. This information is only available at the level 2 order soil survey at a scale of 1:24,000. You will need a level 1 soil survey to provide soils information that can be used for a site specific analysis for proposed soil disturbing activities to adequately discuss the anticipated effects from such disturbances. If we are unable to have access to the actual mapping, are there map unit descriptions and interpretations that we would be able to review? You certainly can start with reviewing the current map unit descriptions and interpretations provided by the Web Soil Survey tools. However, because of scale – the map units will not capture the inclusions. It is these inclusions that a level 1 soil survey would capture. Map units often describe what possible inclusions may exist but do not capture site specific concerns like seeps, wet soils, soils that are already slipping, soils that may have folistic epipedons and have inclusions of spodic properties which would act as carbon sinks, etc...

I'm going to be traveling for work a lot in the coming weeks and will best reached by email.

Thanks again for your assistance,

Andrea

Andrea Thornton
andrea.thornton@nrg-llc.com
 (503) 525-5159 Direct
 (503) 459-6864 Cell
 (503) 525-5155 Fax

6. April 6 and April 10, 2015—Ms. Connolly, MNF Forest Soil Scientist, communicated via email regarding a teleconference on April 29, 2015 with Steve Holden, NRG.

From: Andrea Thornton [andrea.thornton@nrg-llc.com]
Sent: Friday, April 10, 2015 12:36 PM
To: Connolly, Stephanie -FS
Cc: Steve Holden
Subject: RE: Atlantic Coast Pipeline Project

Hi Stephanie,

Thanks for your reply. The 29th will work for both of us. I'm located in our Portland Oregon office so anytime after 10:30 am Eastern Time will work.

Thanks for fitting us into your busy schedule!

-Andrea

Andrea Thornton
andrea.thornton@nrg-llc.com
 (503) 525-5159 Direct
 (503) 459-6864 Cell
 (503) 525-5155 Fax

From: Connolly, Stephanie -FS [<mailto:sconnolly@fs.fed.us>]
Sent: Friday, April 10, 2015 8:47 AM
To: Andrea Thornton
Cc: Steve Holden
Subject: RE: Atlantic Coast Pipeline Project

Andrea - I have been on leave this week and only periodically checking email. I am not available today or next wee through Wednesday to discuss the Pipeline project and soil survey needs. I may be able to schedule something Thursday 16th but am waiting on the availability and follow up needs from a prior scheduled project. My first date of full availability will be the 21st. Then again from the 27-30th. I can schedule something for the morning of the 21st or the afternoon of the 27th and any time on the 28 or 29th. My calendar fills very fast so a quick reply will ensure we can set a date.

Thank you,

Stephanie J. Connolly
 Forest Soil Scientist
 Monongahela National Forest
 200 Sycamore Street
 Elkins, WV 26241
 (304) 636 - 1800 ext. 244
sconnolly@fs.fed.us

From: Andrea Thornton [andrea.thornton@nrg-llc.com]
Sent: Monday, April 06, 2015 11:48 AM
To: Connolly, Stephanie -FS
Cc: Steve Holden
Subject: Atlantic Coast Pipeline Project

Hi Stephanie,

Thank you for your responses to my questions back in March. Do you have any availability this week to have a call with myself and Steve Holden (another NRG soils resource specialist) to continue our discussion about the soils survey on the forest? Please let me know if there is a day/time that works best for you.

Thanks again,
 Andrea



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7. April 22, 2015—MNF issued a special use permit (SUP) authorizing ACP to conduct surveys along proposed routes crossing the MNF. A document attached to the SUP, *Recommended Environmental Resource Surveys for Proposed Atlantic Coast Pipeline Routes*, dated April 21, 2015, contained protocol and required qualifications for field personnel for surveys of various resources including soils. The requirements for the soils surveys specify that surveys must meet the requirements of an order 1 soils survey and be conducted by a professional journey level soil scientist with experience in the Appalachian Region. (Please see page 32 of *Recommended Environmental Resource Surveys for Proposed Atlantic Coast Pipeline Routes* in Appendix 2.)
8. April 29, 2015—Ms. Thornton and Mr. Holden of NRG held a conference call with Ms. Connolly, MNF Forest Soil Scientist, lasting about an hour. Discussion items included protocols for an Order 1 level soil survey, timing of the surveys, requirements for sampling, the appropriate methods and labs to be used, and the rugged nature of the terrain. Qualifications of field personnel were specifically discussed. In addition, Ms. Connolly offered NRCS as a resource given the soil survey updates that had recently occurred in the area. (See below for proof of Ms. Connolly's acceptance of the meeting.)

From: Connolly, Stephanie -FS
 Sent: Wednesday, April 29, 2015 9:18 AM
 To: Andrea Thornton
 Subject: Accepted: ACP Soil Survey Call
 When: Wednesday, April 29, 2015 10:30 AM-12:00 PM.
 Where:

9. May 27, 2015—Ms. Connolly, MNF Forest Soil Scientist, emailed NRG at NRG's request to provide a list of suitable contractors known to be qualified to conduct soils surveys in the region. Ms. Connolly copied Tom Bailey, GWJNF Forest Soil Scientists.

From: Connolly, Stephanie -FS
Sent: Wednesday, May 27, 2015 10:45 AM
To: Andrea Thornton
Cc: Bailey, Thomas -FS
Subject: RE: Atlantic Coast Pipeline Project - local contractors for soil surveys

Andrea – I finally was able to track down a local contractor that you could possibly work with in the region to help you with the soil survey portion of this ACP project. This is the Nicholas Putnam Group. I know these individuals to provide quality and reliable work.

Please contact Steve Carpenter and or Charles Delp at:
<http://www.npgsoils.com/Contact-Us.html>

Looking into the WVAPSS website is also a way to find local contractors as well as through Virginia soil science society websites.

Disclaimer: This response does not represent an official USFS endorsement or solicitation for services of the companies listed above.



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10. July 7, 2015—The Forest Service met with ACP to discuss various aspects of the proposed ACP Project. Of notable conversation during this meeting was discussion of the soil surveys that had not yet been started. Bob Orndorff and Bill Scarpinato of ACP told the Forest Service that a geotechnical firm would be handling the soil surveys rather than NRG. Ms. Connolly, MNF Forest Soil Scientist, asked about credentials. Following the meeting, Mr. Orndorff reassured Ms. Connolly that the Forest Service that resumes would be provided for review prior to selection. He also confirmed that the credentials of contractors conducting various other surveys had been provided to the Forest Service for review and approval, and stated he understood the Forest Service's concern about understudies and interns that had been used to develop portions of resource reports that were less than adequate. (See meeting notes provided in Appendix 3.)
11. July 14, 2015—Colin Olness contacted Ms. Connolly, MNF Forest Soil Scientist, to discuss the soils survey. Ms. Connolly informed Mr. Olness in this conversation that Mr. Orndorff had said on July 7, 2015 the Forest Service would be able to review resumes prior to the selection of the subcontractor for the soil survey. Mr. Olness informed Ms. Connolly that the selection of the contractor and field personnel had already been made. Ms. Connolly requested to see the resumes of the company and the professionals selected to conduct the work. Mr. Olness replied that he would submit those resumes within a week's time. However, Mr. Olness did not follow up on his commitment to provide this documentation, as discussed below.

From: Colin P Olness (Energy - 2) [<mailto:Colin.P.Olness@dom.com>]
Sent: Tuesday, July 14, 2015 3:47 PM
To: Connolly, Stephanie -FS
Cc: Spencer Trichell; Sandra H Williams (Services - 6); William A Scarpinato (Services - 6); andrea.thornton@nrg-llc.com; Steve Holden
Subject: ACP: Contact information, Colin Olness

Stephanie,

Thanks for taking my phone call this afternoon. Attached is my vCard as discussed. Moving forward if you have any questions or concerns regarding the soils surveys please contact me.

We appreciate your concerns and look forward to receiving your comments on the resource reports.

Thanks again

Colin Olness, PE
Contractor
Atlantic Coast Pipeline - Construction
99 Edmiston Way
Buckhannon, WV 26201
(C) 304.203.9011
Colin.P.Olness@dom.com

12. July 14 and July 15, 2015—Jennifer Adams, Forest Service Special Project Coordinator, and Mr. Olness, ACP consultant communicated regarding upcoming soil meetings. Ms. Adams informed Mr. Olness of the Forest Service's preference to conduct meetings for both forests at the same time.

Colin,

I'm sorry that I missed your call.

Thank you very much for communicating with us regarding the anticipated soil surveys on the GWJNF. Please contact me on all communications with Tom Bailey at the GWJNF.

Stephanie Connelly informed me that you contacted her as well. Please be advised that there is a Memorandum of Understanding (MOU) between the MNF and the GWJNF, and as the coordinator of the projects for both forests, I need to be aware of all communications to both forests. Therefore, please copy me, and also Kent Karriker, on communications to Stephanie.

Due to the MOU, it may be very helpful for any coordination meeting to involve both forests at the same time.

Thank you again,
Jennifer



Jennifer P. Adams
Special Project Coordinator
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From: Colin P Olness (Energy - 2) [<mailto:Colin.P.Olness@dom.com>]

Sent: Tuesday, July 14, 2015 4:07 PM

To: Adams, Jennifer - FS

Cc: Spencer Trichell; andrea.thornton@nrg-llc.com; William A Scarpinato (Services - 6); Sandra H Williams (Services - 6)

Subject: ACP: Soil Survey Contact information, Colin Olness

Jennifer,

I left you a message to introduce myself and let you know to contact me with any questions regarding the soil survey in the GWNF. This program will be kicking off very soon and we will schedule a coordination meeting with you and your team. I spoke with Thomas Bailey earlier as an introduction.

My contact information is attached. Please contact me if you have any questions or concerns.

Thank you

Colin Olness, PE

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Atlantic Coast Pipeline - Construction
99 Edmiston Way
Buckhannon, WV 26201
(C) 304.203.9011
Colin.P.Olness@dom.com

13. June 30, 2015—During a meeting with ACP, Ms. Adams asked ACP and its consultants when the soil surveys would be conducted. Ms. Adams and Mr. Karriker expressed concern over the soils surveys being conducted post-filing rather than pre-filing. (See the meeting notes provided in Appendix 4.)

14. August 20, 2015—Colin Olness requested a soil survey kickoff meeting with the Forest Service.

Jennifer,

I wanted to follow my voice message with an email. We would like to coordinate a date for the kickoff meeting and soil surveys in the near future. Prior to that I would like to review a draft agenda, list of attendees, preferred location and proposed schedule with you. Please give me a call (contact information below) to discuss.

We are looking forward to starting this effort.

Colin Olness, PE

Contractor
Atlantic Coast Pipeline - Construction
99 Edmiston Way
Buckhannon, WV 26201
(C) 304.203.9011
Colin.P.Olness@dom.com

15. August 21, 2015—Stephanie Connolly, MNF Forest Soil Scientist, emailed ACP and/or its consultants to express concern about the date for conducting soil surveys. See the email excerpt below.

ACP/Dominion – It is very late in the season to be starting your soil surveys here on the Monongahela National Forest. Our request for this work was that it be done this field season when the soils are saturated. There was no better time than May June and July when the Forest received 24 inches of rain in those three months to see the maximum expression of how the soils respond during wet weather. Not only is a soil survey required but also a mapping of specific sensitivities like hydric soils, wet soils, soils prone to slippage, etc. I had asked on several occasions to have these types of conversations about the details and planning early on and got little to no response or follow up from those conversations. We started the initial conversations back in April and there were intentions set to start this work along with the other surveys. Also I had provided a list of potential subcontractors that could be used for this work and it has come to my attention that this list was not used. In addition to this, I was also told that I would have a chance to at least review the potential list of contractors selected for this work at the June meeting in Elkins by Mr. Orndorff. This too was found to be untrue given that the contractor has already been selected. The specialized skill and requirements needed to conduct this Order 1 level soil survey are specific to those who have skills within the Appalachian Region and it is imperative that a certified professional soil scientist head this survey work.

The need for this inventory is very apparent when reviewing the current Chapter 7 and Chapter 6 resource reports. Much of this information is not site specific and lacking in detail to be able to be used for effects analysis or design. The slope analyses is completely unacceptable and very elementary at best. We have provided extensive comments pointing out the flaws and misinformation used in the reports, and this is mostly due to scale and a lack of understanding of the soil resource by the author.

I now will be out of the office until September 14th. Upon return I have a commitment to already scheduled higher priority projects. My schedule becomes free October 14. At that time I will be able to schedule a meeting and it should involve soils, geology and watershed so that a comprehensive understanding of what is needed for data collection is heard by the company from all resources involved.



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16. August 25, 2015—Ms. Adams, responded to Mr. Olness's request for a meeting with a time period where staff would be available for meeting. Ms. Adams reiterated that Mr. Orndorff told the Forest that we would be able to review the potential list of contractors selected for this work. It was then reiterated that a specialized skill set is needed to conduct this work and that local knowledge is needed. See the email excerpt below.

We were told by Mr. Orndorff on July 7 at the meeting held at the WV DNR that Stephanie could have a chance to at least review the potential list of contractors selected for this work. The specialized skill and requirements needed to conduct this Order 1 level soil survey are specific to those who have skills within the Appalachian Region and it is imperative that a certified professional soil scientist head this survey work. We would like to have that opportunity.

I'll be in touch with Bill and you this week.

Thank you,
 Jennifer



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17. September 24, 2015—ACP and its consultants emailed the presentation containing its proposed methods for conducting soils surveys. The company notified the Forest that they intended to start on October 3, 2015 following a meeting to discuss methods on October 2, 2015. The timeframe estimated by ACP and/or its consultants for completing soils surveys was two to three weeks. As subsequently shown, field work actually began on October 2, 2015, such that the Forest Service's comments and protocols discussed on October 2 could not have been

incorporated to the field work that began on October 2. Also as subsequently shown, the field work was completed in far less than the anticipated time—in an amount of time that Forest Service soil scientists indicate is questionable.

Jennifer,

Attached is a presentation (draft) of the proposed survey program for your information. We will review this during our meeting scheduled for 10/2. We intend to begin soil surveys 10/3/15. Our crews will be on site for an internal briefing on 10/2.

The crews anticipate roughly two to three weeks of field work to collect the samples. We've allowed for some contingency time to account for the inevitable unforeseen challenges.

I will attend next weeks meeting to answer any other questions.

Thanks for your help.

Colin Olness, PE

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Atlantic Coast Pipeline - Construction
99 Edmiston Way
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(C) 304.203.9011
Colin.P.Olness@dom.com

18. September 24, 2015—Ms. Adams acknowledged the email and alerts the company that the Forest Service will review the draft to ensure the proposed methods meet Forest Service's needs.

Colin,

Thank you for providing your proposed draft for the soil surveys. The Forest Service soil scientists will review and edit the draft to ensure the proposed methods meet the Forest Service's needs.

Thank you,
Jennifer



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19. October 2, 2015—Meeting held between ACP and its consultants with Monongahela National Forest and George Washington Jefferson National Forest to discuss ACP's proposed methods for conducting soils surveys. The Forest Service provided written comments on ACP's proposed methods. Additionally, the Forest Service provided comments on the meeting notes to ACP following the meeting. (See Appendix 5).
20. October 6, 2015—Ms. Adams emailed Mr. Scarpinato of ACP and ACP's consultants requesting resumes and reminding that ACP informed the Forest Service on July 7, 2015 that resumes would be provided for review. See the email excerpt below.

On the day of the meeting you mentioned that resumes will be available for review on October 16, but you also said surveys began on the day of the meeting. Given Dominion told us on July 7, 2015, and also during a subsequent conversation between Colin and Stephanie, that we could review resumes, we'd like to receive those resumes as soon as possible. As I told NRG on a call about small mammal surveys, we have to be comfortable in briefing management about study results. Because the results are a function of the methods and the field personnel, it's imperative that we review the resumes as soon as possible to ensure qualified personnel are conducting the surveys.

Also, I've not yet been notified in writing or by phone, per the communication protocol, about where and when the studies are being conducted. I appreciate your attention to this matter.

We appreciate you recognizing the FS requirements for soils surveys on NFS lands. Our requirements are a result of the expertise based and extensive experience of the FS soil scientists with forest soils. Tom Bailey has been working on and studying forest soils for 35 years for the FS, in addition to his experience with non-forest soils in the private industry before coming to the FS. Stephanie Connolly has established her career with the FS working on forest soils, her expertise and knowledge of all soils is demonstrated by her recent accomplishments as a coach for the USA Soils Judging Team. In September, the USA Soils Judging Team won the international soils judging contest held in Hungary. The graduate student working under Stephanie placed 7th in the world in the individual contest. They competed against countries that had professional soil scientists on the teams. Therefore, while the FS requirements for FS soils surveys may be more stringent than the requirements for soil surveys on private lands, we're confident in the methods and logic behind the FS's requests.

Thank you,
Jennifer



Jennifer P. Adams
Special Project Coordinator
Forest Service
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21. October 6, 2015—Ms. Adams emailed Mr. Scarpinato of ACP informing him that ACP did not comply with the Forest Service's requirements regarding protocol and qualifications of field personnel. See the email excerpt below.

Bill,

Immediately after I sent my original email below, I received another email from USFS soil scientists which essentially reiterated my concerns stated in my previous email. I'll provide the paragraph below.

ACP Dominion did not comply with the initial USFS requirement in the special use permit to provide resumes and documentation of qualifications of the soil survey contractor conducting soil surveys prior to starting the work; and ACP directed that contractor to start the surveys without any consultation with the USFS.

GEOSYNTEC is delaying the submission of the current contractors qualifications for more than 2 weeks (October 16th, 2015) while the contractor has already started work and will be working in the field on the forest. Therefore, it is assumed by the USFS that the contractors actually gathering the data in the field may not actually have soil science degrees and may not have any regional soil characterization experience. Without having reviewed resumes of field personnel, we have no assurance about quality control or quality assurance of data currently being collected.

Please notify us in writing whether or not surveys are currently being conducted in the field, including the date the surveys began, keeping in mind Colin said e surveys began on the day of our meeting (October 2). Please also indicate the location of the survey crew, and please remind the crew about the communication protocol.

Please be advised that data collected prior to the FS's approval of resumes of field personnel may not be acceptable.

I look forward to promptly receiving resumes of soils personnel.

Jennifer



Jennifer P. Adams
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22. October 9, 2015—ACP's consultant emailed Ms. Adams in response to her October 6, 2016 email. See the email excerpt below. In item 23 below, the Forest Service refutes some statements made by Mr. Olness in his October 9 email.

We'd also like to thank you and your team for meeting with us and understand the challenges of coordinating schedules to get everyone together. Meetings minutes / notes are being prepared and reviewed internally and will be made available.

As requested below is the schedule of work for the Order 1 soil surveys currently under way.

Date	Task
10/02 – Friday	H&S Meeting, Crews begin sampling on MNF
10/03 – Saturday	MNF Sampling (cont'd)
10/04 – Sunday	MNF Sampling (cont'd)
10/05 – Monday	MNF Sampling (cont'd)
10/06 – Tuesday	Crews begin sampling on GWNF
10/07 – Wednesday	GWNF Sampling (cont'd)
10/08 – Thursday	GWNF Sampling (cont'd)
10/09 – Friday	GWNF Sampling (cont'd)
10/10 – Saturday	Crews complete soil sampling

The field crew is conducting the order 1 survey per the NRCS protocol. The request for resumes is noted and these will be provided as discussed. Geosyntec is not delaying the submittal of the resumes. I will apologize to Stephanie for the miscommunication on my part. Geosyntec is in the field and will provide these as soon as they are able.

The geohazard survey program is set to begin 11/4/15. We request a meeting 11/3/15 in order to brief your team on the geohazard field program.

Thanks again for the meeting and we look forward to meeting with you and your team on the 3rd.

Colin Olness, PE

Contractor
 Atlantic Coast Pipeline - Construction
 99 Edmiston Way
 Buckhannon, WV 26201
 (C) 304.203.9011
Colin.P.Olness@dom.com

23. Regarding item 22 above, the Forest Service notes the following inaccurate information provided by Mr. Olness in his email, as shown by the timeline and other comments made by Mr. Olness.
- 1) Mr. Olness in a previous email stated that it would take the company two to three weeks and possible longer to complete the soil surveys. – The company completed the surveys in less than ten days.
 - 2) Mr. Olness says that Geosyntec is not delaying the delivery of resumes. Documentation to be provided in this record will show that indeed resumes were delayed intentionally.
 - 3) Mr. Olness assures the Forest Service that an Order 1 soil survey is being performed to Forest Service standards and NRCS standards. Again documentation will be provided that this was not the case.
 - 4) Note that the schedule was provided to the Forest Service after the work had already been completed; therefore, work could not be monitored in the field.
 - 5) Note that no notification of presence on Forest conducting the surveys was given to the District Rangers or Forests in general.
24. October 16, 2015—Kent Karriker, MNF Ecosystems Group Leader, emailed ACP and its consultants to document concerns with the progress of the soil surveys on National Forest System lands.

Bill, Spencer, and Colin,

Please send an immediate update on the progress of soil surveys on National Forest land. The schedule that you provided on 10/9/15 suggested that most work had already been conducted by that time, and that the surveys would be completed by 10/10/15. Based on this schedule, we are concerned about several things:

- Survey work was conducted without proper notification to the appropriate Forest Service contacts of the location, nature, and timing of the work. We are still awaiting such notification.
- If the work has been completed according to the schedule, we have not yet been notified.
- Survey work was conducted without providing professional qualifications of the surveyors to the Forest Service for review.
- Timing of the surveys and lack of proper notification did not allow for Forest Service inspection of the activities.
- The amount of work to be conducted in the allotted time (438 soil pits in nine days) seems unrealistic, unless a very large team of soil scientists was employed.

If soil survey work is still being conducted, please notify us of the progress, locations of completed and ongoing work (including sample locations), and projected schedule. Based on the fact that a substantial portion of the work appears to have been completed prior to Forest Service review of qualifications, we may need to check specific sample locations to verify soil descriptions.

We also reiterate our request that the professional qualifications of the soil surveyors be provided for our review.

Thank you,



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25. October 16, 2015—Mr. Olness, ACP's contractor, responded to Mr. Karriker's email and provided resumes for the Forest Service's review. In the email, ACP's contractor verified that they did not use proper communication protocols as previously agreed to with Ms. Adams. The company confirmed that it conducted an order 1 level soil survey done by NRCS methods, though the Forest Service later became aware that the protocol was not followed.

Kent,

Thank you for the email. We understand the concerns voiced by the FS and hope the below responses provide the clarification needed.

The Order 1 soil survey has been completed per the schedule shown below.

Date	Task
10/02 – Friday	H&S Meeting, Crews begin sampling on MNF
10/03 – Saturday	MNF Sampling (cont'd)
10/04 – Sunday	MNF Sampling (cont'd)
10/05 – Monday	MNF Sampling (cont'd)
10/06 – Tuesday	Crews begin sampling on GWNF
10/07 – Wednesday	GNWF Sampling (cont'd)
10/08 – Thursday	GNWF Sampling (cont'd)
10/09 – Friday	GNWF Sampling (cont'd)
10/10 – Saturday	Crews complete soil sampling

- Survey work was conducted without proper notification to the appropriate Forest Service contacts of the location, nature, and timing of the work. We are still awaiting such notification.
- Please accept our apologies for failing to provide the notification as requested. We will continue to coordinate the soil survey and geohazard program through the appropriate representatives.
- If the work has been completed according to the schedule, we have not yet been notified.
- The order 1 soil survey has been completed per the schedule shown.
- Soil surveys for the remainder of the geohazard program are scheduled to begin 11/2/15.
- Survey work was conducted without providing professional qualifications of the surveyors to the Forest Service for review.
- Attached to this e-mail please find the resumes for the personnel are attached.
- Timing of the surveys and lack of proper notification did not allow for Forest Service inspection of the activities.
- We appreciate the concerns voiced by the Forest Service and would like to offer the following:

Our surveyors will take the FS personnel to the field to review the actual sample locations. The team could also show them how the order 1 survey was accomplished. During this field review if the FS identifies additional locations for sampling we will be prepared at that time to do this. Please contact me to schedule there field visits.

- The amount of work to be conducted in the allotted time (438 soil pits in nine days) seems unrealistic, unless a very large team of soil scientists was employed.
- The Order 1 soil survey completed to date was conducted per the NRCS protocols.

If soil survey work is still being conducted, please notify us of the progress, locations of completed and ongoing work (including sample locations), and projected schedule. Based on the fact that a substantial portion of the work appears to have been completed prior to Forest Service review of qualifications, we may need to check specific sample locations to verify soil descriptions.

- Soil survey work for the classification portion is complete. Additional efforts are scheduled for November of this year.

Formal notification of this field work is coming and will be provided to you prior to the commencement of the surveys.

Colin Olness, PE

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Atlantic Coast Pipeline - Construction
99 Edmiston Way
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Colin.P.Olness@dom.com

26. October 16, 2015—Ms. Connolly informs that she and Mr. Bailey reviewed the resumes provided by ACP or its consultants and determined that only one of the four field personnel were qualified to conduct soil surveys. See the excerpt from Ms. Connolly's email below.

Kent/Jennifer/Ken:

Tom and I have done a precursory review of the resumes for the soil survey crew. We just discussed them on the phone and compared notes. Nan Gray is a credible professional certified soil scientist and has extensive VA soils experience and even possibly WV. The additional 3 members of the crew are not soil scientists. Some do not have more than 1 soils class but yet are claiming the ability to conduct soil characterization and soil sampling. There is some related geology experience and engineering experience which would lead to knowledge about soils and associated effects of soil disturbance however I did not see experience that would indicate the ability to conduct an Order 1 level soil survey outside of Nan Gray's resume. We both agreed that Nan Gray would not physically be able to verify the entire effort for quality control or assurance given the number of soil observations that were needed (estimated 20 soil pits per person per day - total of 438 observations) to cover the order 1 intensity. In addition Tom and I both agreed that it would not be physically possible for one soil scientist to conduct 20 soil pits or soil hole observations in one day. Both of us have extensive transect experience in the Forest(s) and know the type of effort it takes to dig a hole, describe it, describe the other items requested in the deliverables, and possibly sample that hole. We have never in our entire career seen this workload/day carried out by any soil scientist even one with 30 years mapping experience in the Appalachians. So we have serious doubt about the reality of this work actually being completed to specification and call into question that an Order 1 level soil survey field collection effort is complete as indicated in Colin Olness's response from GEOSYNTEC in today's email.

I think that if ACP Dominion is going to insist that the soil survey is complete and the work was conducted in a manner that was spelled out in the permit and reviewed in our meeting, an immediate field review needs to occur as indicated in Mr. Olness's email.

I can make myself available Monday 26th, Wednesday 28th, after 11am on the 29th. My next available dates would be Nov 6 or the 9th. I think that multiple locations would need to be verified and a review of the data sheets would also need to occur.

I look to you to decide how to most appropriately proceed with this monitoring of the already conducted soil survey work. I also am looking to you on how to respond back to ACP/Dominion GEOSYNTECT/NRC on the numerous discrepancies that are occurring with the totality of the information surrounding the soil survey for both forests.

Stephanie J. Connolly
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27. October 16, 2015—Ms. Adams emailed Leslie Hart, ACP Vice President, requesting resolution of the issues regarding soils surveys.

I'm hoping you could help me resolve some concerns and issues regarding soils surveys methods and the resumes of the field crew. We asked to review resumes of the field crew conducting the soils surveys, just as we did for other resources. Our conversations about requirements for soils surveys began last spring and continued thereafter. On July 7, 2015, during a meeting attended in part by myself, Clyde Thompson (Forest Supervisor, MNF), MNF staff, and Dominion, Bob Orndorff informed us that resumes of field crew personnel would be provided for our review. During a meeting held on October 2, 2015 and attended by NRG, Mr. Scarpinato, myself and three other Forest Service staff, we provided written and verbal input on the proposed soils surveys, based on the presentation provided in advance of the meeting (a presentation which had not taken into consideration our comments about soils made at scoping, on draft resource reports, in meetings and emails). During the October 2 meeting, when we reminded Mr. Scarpinato and Colin Olness of NRG that resumes had not yet been provided to us, Mr. Olness said that the resumes would be provided on October 16 and when prompted by Mr. Scarpinato to provide resumes sooner, Mr. Olness maintained that the resumes would not be available until October 16. During that same conversation, I asked Mr. Olness when the surveys would begin, and he said "today." Because the soils surveys began on the same day of our meeting about soils methods, we're uncertain if our input was incorporated and methods implemented in the field (and most certain our input could not have been incorporated an implemented for surveys conducted on October 2). Because the resumes were not provided for our review until after the soils surveys were completed, our concerns about the qualifications of the field crew are now realized. According to our soil scientists' review of the resumes, only one crew member is a professional soil scientist with relevant experience. The three other crew members are not professional soil scientists and their experience and education in related fields does not qualify them to conduct level 1 order soil surveys and soil characterizations. We considered the possibility that the three crew members with lesser qualifications served as assistants to the professional soil scientist, but it's unlikely that one soil scientist could conduct 20 soil pits or soil hole observations in one day, based on the knowledge and experience of our soil scientists. Thus, considerable concern has been raised about the validity and quality of the survey results. We offered our input to the soils survey methods and review of resumes in order to help Dominion obtain survey results that would meet the Forest Service's expectations and needs, and we look forward to a continued working relationship to find resolution.

Additionally, please let me know if you have any questions, need clarification about any facet of these concerns and issues of soils surveys, or if you require documentation showing our email conversations, meeting notes or our comments filed into the FERC record. As a side note, we asked to receive the meeting notes from 2-3 recent meetings including the soils meeting, for our review. We did, in fact, receive the meeting notes and I'll be sending our comments and edits on the notes next week.

Thank you for your time. I look forward to talking to you on Monday.

Jennifer



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28. October 26, 2015—Nan Gray left a voice message with Ms. Connolly asking her to return her call regarding ACP and the soil surveys. Ms. Gray is the president of Soil Works, Inc. and a licensed professional soil scientist in Virginia. Her resume was provided by Colin Olness as a person who conducted the Order 1 Level soil survey.
29. October 27, 2015—Ms. Connolly returned Ms. Gray's phone call. Below is a summary of the items discussed on the call.
- Ms. Gray introduces herself and the reason she is calling. She has informed me that she has spoken to Tom Bailey on the GWNF and was made aware that her resume was being used as a credential as to having a conducted an Order 1 Level Soil Survey for both NFs for ACP Dominion pipeline.
 - Ms. Gray stated that she had not done this and was in no way employed for this project by Dominion or any other subcontractor including GEOSYNTEC.
 - Ms. Gray stated that on October 15, a Ms. Kathleen Harrison contacted her and requested her resume for use to act as a third party reviewer of soil survey data that had been conducted on the NFs. Ms. Gray at that time agreed and said she would consider the project. She sent GEOSYNTEC her resume on October 16. (See EXHIBITS 23 and 24 documenting this information by Ms. Gray.) Ms. Gray is a highly qualified licensed professional soil scientist in Virginia with extensive experience conducting soils work in the Appalachians.
 - Ms. Gray further disclosed that Ms. Harrison has only collected 126 soil samples. (This amount of data in no way meets the requirements of an Order 1 level soil survey). In addition Ms. Harrison shared with Ms. Gray that she is not a soil scientist but rather as professional geologist. (This is verified by her resume provided by Mr. Olness, ACP's contractor).
 - Ms. Harrison asked Ms. Gray how she would have gone about collecting soil samples and data. She also inquired about where she would get nutrient sampling done and how was this done.
 - Ms. Harrison stated that the soil holes were shallow and that hand troughs were used to sample the soils. (See Appendix 5; see the meeting notes showing the Forest Service's edits provided to ACP, and review including pictures provided by the Forest Service to visualize the soil profiles that are typical within the landscape of the row as well as reference to the tools that should be used to open and sample soil pits. This was directly discussed with and provided in a written format to Mr. Scarpinato of ACP and ACP's consultants, Mr. Holden of NRG and Mr. Olness at the meeting held on October 2, 2015.)

- Given the conversion with Ms. Harrison, Ms. Gray has zero confidence in any of the samples taken for any purpose during the soil survey conducted by GEOSYNTEC.
- Ms. Harrison also stated that she did not want to use licensed soil scientists in collecting data.
- Ms. Harrison was keen to get the remaining soils sampled immediately.
- Ms. Harrison was disappointed to know Ms. Gray had called Forest Service to discuss protocols, permission to sample FS Lands, hunting season restricted field access and the ACP Forest Service Land soil survey part of the project.

In addition to the above information, Ms. Connolly and Ms. Gray discussed what an Order 1 Level Soil Survey entails, the common knowledge about the soils within the ROW and landscape, the concerns for carbon stock assessments, and the actual crew that it would take collect the data in a reasonable amount of time. They also discussed weather and access conditions. Safety issues and equipment needs.

30. October 27, 2015—Ms. Connolly replied to Ms. Gray's email. See the email excerpt below.

Thank you Ms. Gray for contacting the USFS to discuss the status of the soil survey for the portion of the ACP pipelines that cross National Forest System lands. It also was a pleasure in talking with you. I have informed my supervisors of our conversation (listed in the above email addresses) and have been asked to also document our conversation. As soon as I can take a break this afternoon I will do this and share this with your prior to my submission. Basically you have some of the most important details in your email below and I will reiterate them in my report. Also thank you for your attention to detail and good luck with your endeavors.



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31. October 27, 2015—Ms. Gray stated she has done no work for ACP or its contractors, and further states that she was contacted by ACP's contractors on October 15, 2015, following completion of the soils surveys. Her email shows she was not among the field personnel who conducted soil surveys though ACP and/or its consultants identified her resume as one of the field personnel who conducted the surveys, and actually the only personnel that the Forest Service deemed qualified. See the email below.

From: Nan Gray [<mailto:soilwork@pemt.net>]
Sent: Tuesday, October 27, 2015 11:40 AM
To: Connolly, Stephanie -FS
Subject: ACP application re soils

Good morning, Stephanie Connolly.

It was a pleasure talking with you this morning. I was contacted by Geosyntech (for the first time) 15 October 2015 and got my resume to them 16 October 2015. I have done no work of any kind for them. I have been figuring out how to perform the work Kathleen Harrison has told me needs to be done and fit it into the timeframe she dictated (to be out of the FS Lands by leaf fall and surely before the end of November...). Restricted field activities are for good reason and you mentioned 1 November to 15 December is hunting season of one kind or another, which restricts field activities. I shall convey that information for Ms. Harrison to check their special use permit.

Thank you for your attention to detail. We shall talk soon.
 Best,
 Nan Gray

Nan Gray, MS, AOSE, LPSS
 Soil Works, Inc. (SWaM, DBE)
 POBox 3
 Newport, VA 24128
soilwork@pemtel.net
 (540) 544-7791

As always, save your soil.

32. October 27, 2015— Ms. Gray provided documentation showing that she had not been affiliated with ACP or its consultants at the time the soil surveys were completed. Therefore, though Ms. Gray's resume was provided to the Forest Service on October 16, 2015 by Mr. Olness as one of the field personnel conducting surveys, Ms. Gray showed in her email documentation that she was not present in the field and ACP or its consultants falsely identified her as field personnel who conducted the surveys. It was Ms. Gray's resume that the Forest Service identified as being the only field personnel qualified to conduct the soil surveys, but since it is now known that Ms. Gray was not among the field personnel, it is clear that no field personnel were qualified. The falsification of the qualifications of field personnel by ACP and/or its consultants is of concern to the Forest Service. See the email string below.

Hi again, Stephanie Connolly. I am forwarding this note for verification of your interpretation. The next email from Ms. Harrison asks me to not contact you directly but to go through Colin Olness of ACP.

Nobody else has heard of Geosyntech and we wonder who hired them? I do not foresee me working with them unless they straighten their act.

Thank you for fulfilling your duties as nicely as you do.
 Best,
 Nan Gray

From: [Kathleen Harrison](mailto:Kathleen.Harrison@dominionenergy.com)
Sent: 27 October, 2015 12:09 PM
To: [Nan Gray](mailto:Nan.Gray@soilworks.com)
Subject: RE: ACP soils work

Nan,

Thanks for the update, I spoke with Dominion about the Nov. 1 – Dec. 15 restriction yesterday and have been informed it does not apply to their Special Use Permit; however, they are getting confirmation on this.

Dominion has obtained authorization for some of the private lands. We did not cross private lands Dominion does not have authorization to access. This will be consistent for the Order 1 Survey work. The field teams will need to walk in/out from access points that avoid private lands that Dominion does not have access agreements.

The USFS had asked Dominion provide copies of our resumes, including the resume of a soil scientist that the FS requested we obtain to provide a review of our report (this initiated our original conversation). At no point have we identified that you or your company provided input / participation on our project. We are only responding to a later request by the FS to have a certified soil scientist review our report. We had not been alerted of the requirement to have a certified soil scientist until after we had prepared our scope of work and initiated our field work. I have had no direct contact with the FS.

Let me know if you have any questions. I will let you know what I learn on the Nov. 1 assess date restrictions. I will hopefully get clarification on this today.

Regards,

Kathleen

From: [Nan Gray \[mailto:soilwork@pemtel.net\]](mailto:Nan.Gray@soilworks.com)
Sent: Tuesday, October 27, 2015 8:49 AM
To: [Kathleen Harrison](mailto:Kathleen.Harrison@dominionenergy.com)
Subject: ACP soils work

Good morning, Kathleen Harrison.

I spoke with the Forest Service regarding their soil sampling protocols and permission to enter and sample FS Lands. Forest Service Soil Scientist Stephanie Connelly said other utilities have restricted field activities between 1 November to 15 December due to hunting season of one kind or another, which restricts field activities. Can you check your special use permit regarding restricted field activities and send me verification that field activities are unrestricted.

I shall also require copies of written permission for those private lands we shall cross to get to FS Lands.

The FS thinks I had something to do with sampling soils already. If Geosyntech has told someone that I have approved or controlled the sampling of the soils and descriptions, that is wrong. Please remove our company and my name until we agree to perform the work.

Thank you for your attention to detail. We shall talk soon.

*Best,
Nan Gray*

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SoilWorksUSA.com

As always, save your soil.

33. October 27, 2015—Mr. Bailey, GWNF Forest Soil Scientist, provided the following comment in his adequacy review of ACP's resource report 7, Soil Resource Field Surveys, Ref. 7-9, 7-10. (Note: This comment will be included in the Forest Service's upcoming filing of comments on final resource reports.)

Protocols for field work to verify soil survey information on the GWNF have not been completed and what has been accomplished to date has been done by unqualified personnel using inadequate methods. Resumes sent for FS review on Oct 16 were received after soil resource fieldwork was pronounced as "completed" by ACP subcontractor. Sub stated that field work had been completed on Oct 10, 2015. GWNF contacted the only qualified person on the field crew and she said that she did not send her resume in to the subcontractor until Oct 16. She was never hired by the subcontractor, though her resume was sent to the FS as if she had been in the field since Oct 2 collecting field data. She has never collected any field data for the ACP subcontractor. It was also learned that 136 soil samples were collected for lab analysis from shallow holes in the ground dug by hand trowels. Both the number of samples collected for both National Forests and the methods used for collecting the samples are totally outside the protocols submitted to ACP and discussed in person at an Oct 2 meeting with subcontractors in Harrisonburg, VA. Misrepresentation of field crew resumes, the work and the personnel doing the work are serious reasons to question the reliability of any field data collected by ACP for the soil resource report to be submitted to the Forest Service and to the Commission and brings into question the ability of the FS to work with this ACP subcontractor.

34. October 27, 2015—Ms. Connolly, MNF Forest Soil Scientist, provided the following comment in response to Mr. Bailey's comment identified above in item 32.

S. Connolly, MNF Forest Soil Scientist concurs with the statement provided by T. Bailey above. In addition to ACP Dominion Colin Olness misrepresenting Ms. Gray and her professional connection to this process, it is also clear from the email conversations between Ms. Gray and GEOSYNTEC that Dominion did not conduct the Order 1 Level soil survey as they had already stated in several emails provided in this time line. Given the behavior of ACP Dominion and this ACP subcontractor, the Forest Soil Scientist Service is also led to question whether the other members of the crew were present in the field collecting data. (Although, in phone conversation, Ms. Gray mentioned that Ms. Harrison's daughter helped her carry field equipment. There is a resume with a second Harrison provided as part of the crew.) This behavior does draw attention to the credibility and the quality of work provided for other surveys and lead to consideration or recommendation that a thorough review be done to ensure that the data collected was done according to approved methods and that all survey crews had proper credentials. In addition quality assurance and quality control should be done in the field to verify that a second look at the area within the ROW would match with original findings by surveys.

35. November 2, 2015—Ms. Gray emailed Ms. Adams and stated she received Ms. Adams's voice message left earlier on November 2 indicating that, with Ms. Gray's approval, the Forest Service would document this information and file it into the FERC record. In her email, Ms. Gray provided additional information about her communications with ACP's consultants to substantiate that Forest Service protocols were not followed. See the email excerpt below identifying parts of Ms. Gray's conversation with ACP's consultants.

1) During my discussion of sampling protocol with Ms. Harrison, I referenced the soil sampling protocols of the NRCS publication, "Field Book for Describing and Sampling Soils", Version 3.0, 2012, National Soil Survey Center, Natural Resource Conservation Service, USDA*

2) Ms. Harrison was unfamiliar with that standard, and so she could not tell me the differences between that and the Order 1 Forest Service protocols.

3) The sampling she told me she did was mixed every 10 inches. *That is not standard soil sampling protocol for a natural resource. Nothing about her descriptions of sampling was how soils are to be sampled.

4) Ms. Harrison dismissed soil mineralogy.

5) What started out as a Third Party Reviewer position interview, with resume to be considered for the position, turned into recognizing there were no soils data to review.

APPENDIX 1

Soils Protocols Provided to ACP

Soil Resource Input for needs regarding data collection for proposed pipeline route across the MNF.

The surveys needed for the soil resource will require a site specific order 1 level soil survey within the corridor. An Order 1 Soil Survey is defined by the USDA NRCS in the referenced document. http://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2_054252

This task would need to be performed by a professional journey level soil scientist with experience in soil mapping and description in the Eastern US with preferred expertise in the Appalachian region (GA-Maine).

- The following data would need to be collected as part of this order 1 soil survey:
 - Information and data that can be used in analysis to determine soil stability and predictions for erosion and sediment control.
 - Slope
 - Soil type
 - Soil mineralogy
 - Depth to bedrock and bed rock structure/ dip slope
 - Presence of pans
 - Indications of past slope failures both natural and those attributed to anthropogenic disturbance such as road building, logging, mining and other activities.
 - Presence of subsurface water tables
 - Description of the organic horizons and an assessment of below ground carbon stocks related to the soil types within the corridor to account for loss of stored carbon stocks as well as sensitive organic horizons that act to store carbon and water and are part of niche biological habitats
 - Soil chemistry assessments for the presence of base poor soils as required by the Forest plan. This is mainly soil types that form over the Pottsville geology but are not limited to this formation. This too is required by the Forest plan.

In addition, the following document should be used as a tool in guiding additional data collection for determining slope stability on USFS lands.

Prellwitz, Rodney W.; Koler, Thomas E.; and Steward, John E., coords. 1994. **Slope Stability Reference Guide for National Forests in the United States**. Publication EM-7170-13. Washington, DC: U.S. Department of Agriculture, U.S. Forest Service, Engineering Staff. 3 volumes, 1091 p

APPENDIX 2

Recommended Environmental Resource Surveys for Proposed Atlantic Coast Pipeline Routes

**Recommended Environmental Resource
Surveys for Proposed Atlantic Coast Pipeline
Routes
Monongahela National Forest
April 21, 2015**

INTRODUCTION

Atlantic Coast Pipeline, LLC (ACP) has proposed constructing a 42-inch diameter pipeline to transport natural gas from north-central West Virginia to several delivery points in North Carolina and eastern Virginia. As currently proposed, the pipeline would cross National Forest lands managed by the Monongahela National Forest (MNF) for approximately 17 miles. Other alternative routes that might affect varying amounts of MNF land could be proposed. The proposed pipeline would also cross National Forest lands managed by the George Washington National Forest.

The Federal Energy Regulatory Commission (FERC) has jurisdiction over interstate pipelines. FERC will be the lead federal agency for the pipeline permitting and routing decision, and they will prepare an Environmental Impact Statement to support their decision. The Forest Service will make a separate decision on whether to permit use of National Forest land for the proposed pipeline. The Forest Service is participating in the FERC process as a cooperating agency, and the Forest Service intends to rely on the FERC EIS when making its decision on the use of National Forest land for the proposed pipeline.

ACP applied for a special use permit to conduct environmental and routing surveys along the proposed route through the MNF. The results of these surveys are intended to inform FERC's EIS. The MNF has issued a decision to allow the surveys (surveys on the George Washington National Forest were permitted separately and are not addressed in this document). The permit authorizes the specific surveys that ACP requested in their permit application, as well as any additional surveys deemed necessary by the Forest Service or other federal and state agencies, provided the effects of such surveys are within the scale and scope considered in the original permit decision. The Forest Service anticipated some of these additional survey needs and compiled the resource survey recommendations contained herein. These recommendations identify key pieces of information that are likely to be needed for the Forest Service decision. It is in the best interests of ACP, FERC, and the Forest Service to collect data that meet these needs; therefore, the surveys conducted by ACP should consider, at a minimum, the items addressed in this document. Surveys should be sufficiently thorough and comprehensive to adequately inform the decision-making process and to allow the MNF and the public to review, understand, and critique the survey (methods, assumptions, sources, conclusions, etc.). The Forest Service anticipates coordinating with ACP and FERC on an ongoing basis to further develop the situation-specific details of data needs and survey protocols. Before implementation of surveys, any procedures, protocols, assumptions, sources, references, etc. not considered herein should be reviewed and approved by the MNF.

Surveys should cover the entirety of the 300-foot-wide survey corridor, as identified in ACPs application for the survey special use permit. Surveys should also cover any areas outside the survey corridor that would be disturbed by the proposed pipeline, including, but not limited to, proposed access routes, staging areas, and temporary construction areas. Surveys may also need to extend beyond the survey corridor to fully inventory certain resource features that lie partially within the survey corridor, or that lie outside the survey corridor but could potentially be impacted directly or indirectly by activities within the corridor. Examples of such features may include, but are not limited to, species populations, cultural resource sites, receiving streams and

wetlands, karst features, scenic resources, and habitats that may be fragmented by the proposed pipeline.

In addition to the proposed route, field surveys should be conducted to the same level of detail for all other alternatives that would affect the MNF.

Notes:

- Because FERC is the lead federal agency, they will consult directly with the US Fish and Wildlife Service (USFWS) for any threatened, endangered, and proposed species that would be affected by the proposed pipeline. Data needs identified herein for threatened, endangered, and proposed species are specific to the Forest Service permitting decision. The USFWS may identify additional information needs and/or survey protocols.
- Cultural Resource surveys are not addressed in this document. These surveys will follow required protocols established in a separate permit to be issued under the authority of the Archaeological Resources Protection Act of 1979 (ARPA).

Terrestrial Wildlife

Several federally Threatened, Endangered or Proposed (TEP) animal species and a variety of vertebrate and invertebrate Regional Forester Sensitive Species (RFSS) are known to occur within the proposed ACP study corridor and/or suitable habitat for these species exists within the area. TEP animal species include the endangered Indiana and Virginia big-eared bats, the threatened northern long-eared bat, and the threatened Cheat Mountain salamander.

A list of Monongahela National Forest (MNF) RFSS animal species is included at the end of this section; recommendations included in this section address only the terrestrial animal species. We recommend that the applicant coordinate with MNF Forest Wildlife Biologist as well as the WV Division of Natural Resources and the WV FWS Field Office to determine which RFSS species may be present within the study area. Hereafter in this section, TEP and RFSS species will be combined for ease of discussion as TES species (Threatened, Endangered or Sensitive). For those TES species with known occurrences or known habitat within the corridor, specific survey recommendations are given below.

General Habitat Surveys

While observations may already exist for some TES species (e.g., northern flying squirrel, Vesper Sparrow, southern water shrew, small-footed bat, little brown bat, and others), the lack of known observations does not preclude the potential for the species to be present given suitable habitat. Thus, we recommend that habitat assessments be conducted within, but not limited to, the proposed 300' wide survey corridor within the 2,000' study corridor in order to determine whether further surveys may be necessary for TES species that currently lack presence-absence data within the area (see discussion in the Introduction regarding the areal extent of surveys). General habitat evaluations are helpful, however, many TES are associated with a few specific habitat types, which we recommend be considered in greater detail. These include:

- Rocky habitats (e.g., rock outcrops, talus slopes, ledges, etc.), which provide habitat for timber rattlesnakes, green salamanders, Allegheny woodrats, small-footed bats, rock voles, and other species;
- Grasslands and early successional habitats (even if highly disturbed), which can provide suitable habitat for the Vesper sparrow, golden-winged warbler, etc.;
- High elevation spruce-northern hardwood forest, which provides habitat for the northern goshawk, Cheat Mountain salamander, and northern flying squirrel as examples; and
- Wetlands (both permanent and ephemeral), seeps, streams, and other aquatic resources which also provide habitat for terrestrial species, such as the southern water shrew, olive-sided flycatcher, among other RFSS. It should be noted that some of these ephemeral wetland habitats (including vernal pools) may not meet the jurisdictional boundaries of "waters of the United States". However, even if isolated, these isolated wetland resources do provide important habitat for wildlife and should be noted as part of the habitat survey efforts.

Field reconnaissance generally includes walking transects and visiting potential "special habitats" (see above) to assess wildlife habitat and probable use of the area by wildlife species, including TES. This does NOT include special surveys that require specific techniques and focused effort (e.g., goshawk surveys, breeding bird surveys, bat surveys, etc.); it also includes only a general assessment of special habitats. If such habitats and/or TES species are found in an area, it is recommended that more detailed survey efforts be undertaken.

Timing of these surveys does make a difference, thus be sure to note the date when filling out survey forms. For example, the breeding season for most of our birds runs from mid-May through the end of June. Surveys made during this time period (especially earlier in that time period) are more likely to detect a larger number of bird species, and it is likely that the area is considered to have nesting habitat for the species. Birds detected during surveys earlier or later in the year may well be migrants or wintering individuals. Likewise, surveys of rock outcrops made in the spring or fall are more likely to detect several RFSS (e.g., green salamanders, Allegheny woodrats, and rattlesnakes), than those in the summer or winter, as a result of life history characteristics of those species.

- 1) **Transects** should be walked at a slow to normal pace, looking for signs of wildlife, special habitats (e.g., rocky outcrops or seeps/wetlands), and habitat features (e.g., large hollow denning trees or exceptional roost trees). In addition to looking for wildlife, biologists should note any RFSS or invasive plant species or evidence of potential archaeological resources.
 - a) Where possible, scan surrounding hillsides or valleys for rock outcrops, seeps, etc. If special habitats (not already planned for visitation based on the office review) are noted while walking transects, they should be surveyed as well.
 - b) Use the habitat survey form to describe the general habitat type and ecological setting, dominant tree species and understory vegetation, etc. Also note any wildlife species observed on this form – the species form is used only for TES species.
 - c) Take pictures – general habitat and any special habitats or features or wildlife/sign.

- 2) **Surveys of special habitats**
 - a) **Rock outcrops, talus, boulder/rubble fields, etc.** These areas provide potential habitats for several RFSS, including woodrats, rock voles, rattlesnakes, small-footed bats, and green salamanders. Ledges and large outcrops with cracks and recesses that provide possible cover should be noted and described. Likewise, large talus fields should be noted, including a general description (e.g., general rock size, is it wet and mossy? forest cover type, etc.). This information will help in making determinations as to whether the area provides potential habitat for TES.
 - i) Take a single GPS point if small, or several around the periphery if large area.
 - ii) Keep an eye out for possible woodrat latrines or middens (large pile of sticks, leaves, trash, etc. near the entrance to rock crevices), but be skeptical since it is easy for gravity to pile up material in rock crevices.
 - iii) Use a flashlight to scan in crevices for green salamanders and small-footed bats.
 - b) **Riparian habitat transect.** Riparian areas provide critical habitat for a wide variety of species, from wood turtles to wood ducks, and are protected by Forest Plan direction. In addition to a general description of the area and vegetation, specific habitat features should be noted, such as cavity trees, stream type (e.g., intermittent, perennial), general stream width, bank type (e.g., gradual slope; undercut bank; ledge, boulders or cobble), flooding regime, etc. See also specifications for stream inventory in the hydrology section of this document.
 - i) Make note of burrows, tracks in mud, cavities or stick nests, and other evidence of wildlife use of the area.
 - c) **Seeps.** Seeps are important habitat features for a variety of species and also are protected by Forest Plan direction, regardless of Clean Water Act jurisdictional status.

- d) **Wetlands, open water bodies and vernal pools.** These habitats are critical to a wide variety of species, both those that are obligate wetland species (e.g., ducks, wading birds, muskrat, and many frog and salamander species) and those that use the areas for drinking water. While most wetlands and ponds are obvious during any time of year, vernal pools often only contain water for a limited period of time in the spring and/or fall – yet they are critical to many species. If no water is present, other characteristics (e.g., topography, vegetative species present, darkened leaves, etc.) must be used to identify these areas.
 - i) GPS the site, but don't worry about taking points all the way around a very large pond or wetland as these should be visible from aerial photographs. Do take points all the way around smaller wetlands or pools.
 - ii) Attempt to estimate current and maximum water depth and/or hydroperiod (e.g., permanent water body vs vernal pool) and NWI wetland type (e.g., coniferous or deciduous forested wetland, scrub-shrub wetland, marsh, meadow, bog ...)
 - e) **Caves or other karst features.** Scan the area for cave openings, sinkholes, etc. If found, take a GPS point, but do not enter any cave or other karst openings without specific, additional permission from the Forest Supervisor. All caves are currently closed to entry.
 - f) **Other habitats.** Other special habitats, such as spruce forests and grasslands, may be encountered. Those habitats and any species noted there should be addressed in a manner similar to those noted above.
- 3) **Documentation of wildlife using the area.** Any wildlife species observed (including indirect observations such as tracks or stick nests) should be documented on the habitat survey form. The species observation form will also be used to document TES species.
- a) List the birds that you see and hear; also note any nests found. Consult the breeding bird point count database before heading out to the field to see if there are any routes located nearby and familiarize yourself with the species that were observed there if similar habitat.
 - b) Make note of mammal tracks and other wildlife sign both while walking through units and driving between areas.
 - c) Photo-document any species or feature that cannot be identified in the field (e.g., a salamander, a bird, a stick nest, odd-looking tracks or other sign).
- 4) **TES species encountered.** While the Indiana bat, Virginia big-eared bat, northern long-eared bat and Cheat Mountain salamander are the only federally threatened and endangered animal species on the Monongahela, the Forest provides habitat for many RFSS (see list at the end of this section). If these species are observed during surveys, or other evidence of probable habitat is encountered (e.g., nests that fit the description for a goshawk, or other RFSS bird species, woodrat middens, probable rattlesnake skin, etc.), a species observation form should be filled out. These forms are meant to document the observation and provide information to inform the EIS.
- a) Photos should be taken of all TES species or sign noted as well as of the general surrounding habitat.
 - b) Species observation forms should be filled out completely (or as much as is possible with the information at hand).

- c) A GPS point should be taken, and the coordinates recorded on the data sheet while in the field.

Examples of Species-specific Surveys

The following paragraphs provide recommended survey techniques for some of the TES species that may be associated with habitats in/near the survey corridor. These recommendations are based on current FS survey methodology and/or other established protocols, but do not necessarily represent the only suitable methods available. Timing of surveys will be an important part of the survey protocol for many species, and not all surveys are best conducted at the same time of year (e.g., the rock outcrop surveys are better conducted in early spring and fall, while bat mist-net surveys should be conducted during summer, and Cheat Mountain salamander surveys are temperature and precipitation dependent).

TES BATS

Mist-net surveys have been conducted across the MNF on an annual basis since 1997 to provide evidence of potential Indiana bat maternity colonies, identify other TES bat species, and assist the Forest in ensuring that proposed activities do not adversely impact these species. We recommend that ACP Survey efforts use the same methods (mist-netting) for consistency, complemented with acoustic surveys where practicable to both assist in appropriate location of mist-nets and to pick up species that are likely to be detected and identified using that survey method. The Forest also conducts annual acoustic transects and can provide the results of historical surveys in the proposed survey area to the applicant, if requested, to assist in site locations.

Recommendations for mist-net surveys follow those established by the USFWS for the Indiana bat. In addition, if Indiana bats or northern long-eared bats are captured, the use of radio-telemetry is recommended to identify roost trees and potential maternity colonies. Mist-netting specifications and roost tree data forms used by the Monongahela National Forest are available upon request. While the MNF acoustic driving transect protocol would not be suitable for the proposed survey effort, we recommend that stationary acoustic efforts follow the most recent protocols established by the USFWS.

CHEAT MOUNTAIN SALAMANDER

Known and potential habitat for the Cheat Mountain salamander (CMS) exists within the proposed survey study corridor. It is recommended that all potential habitat in the survey area, as identified through known point locations or based on existing habitat mapping or models, be surveyed by a biologist competent to complete such surveys (i.e., surveyor must be approved by MNF Forest Wildlife Biologist prior to surveys). Areas modelled as CMS habitat must be considered as potential habitat until reviewed by such a biologist; if said biologist determines portions of these areas to be unsuitable for CMS based on habitat characteristics, reasoning based on field visits or prior knowledge of the areas should be provided.

NORTHERN GOSHAWK

Within potentially suitable northern goshawk habitat (large blocks of high elevation northern hardwood and/or spruce forest, which cover most of the survey corridor), it is recommended that surveys for this species be conducted using a broadcast acoustical method and following protocols established in the *Northern Goshawk Inventory and Monitoring Technical Guide* (Woodbridge 2006), as modified herein.

Dawn Acoustical Survey

This method is based on detection of courtship vocalizations and flight displays of goshawks at their nest sites. It consists of establishing “listening stations” in close proximity to known nest stands or patches of suitable habitat and conducting 1½-hour listening periods at dawn during the early breeding season. The following has been taken from the Northern Goshawk Inventory and Monitoring Technical Guide and adapted to local conditions.

Protocol

1) Establishment of survey stations.

Listening stations should be positioned within 150 m of all habitats to be surveyed. Use aerial photographs to determine point locations providing optimal coverage of suitable habitat within a radius of 150 m (7.1 ha). To reduce attenuation of sound by surrounding vegetation or landforms, locate stations on slightly elevated positions, whenever possible, but not on ridges or in large openings. Efficiency may be increased by location of stations on roads; however, tradeoffs with position may occur within habitat patches. Stations must be clearly marked to allow for finding their location in darkness. Whenever possible, establish multiple stations approximately 300 m apart to achieve simultaneous coverage of entire survey area by multiple observers.

2) Timing of surveys

Seasonal timing. To coincide with the peak of courtship vocalizations by goshawks at their nest sites, surveys should be conducted during the month preceding egg laying. Reproductive chronology likely varies between geographic regions and elevations, and local information should be used to estimate egg-laying dates. For the Monongahela National Forest surveys should be conducted between February 01 and March 15 (see Figure 1).

Note that during years with particularly cold or wet spring weather, onset of incubation may be delayed for up to 1 month. If no detections of goshawks are heard during the first listening session, a repeat session should be conducted before May 15. Two sessions are required to assign “unoccupied” status to the area surveyed.

Session timing. The observer should arrive and be settled at the listening station *at least* 45 minutes before sunrise. The listening session should continue until 1½ hours after sunrise. Plan carefully so that the entire listening session can be conducted without interruptions.

3) Listening session methods. During each listening session, record start and stop time, actual sunrise onset, time and duration of goshawk vocalizations, type of goshawk vocalizations, and direction (bring compass) and estimated distance of goshawk vocalizations. To ensure consistency of data collection, a standard field data collection form (Appendix X) should be used. Dewey and others (2003) reported a variety of calls detected during dawn acoustical surveys in Utah. Calls included variations of the alarm call (*kak-kak-kak*) (Squires and Reynolds 1997) and plaintive wail call (Squires and Reynolds 1997). Length of vocalizations varied from short, one-note call segments to series of alarm calls and wails lasting up to 10 seconds.

- 4) Locating nest sites. Auditory detection of goshawks during courtship indicates occupancy of the surveyed forest patch; subsequent location of the nest should not be attempted until after the estimated date of hatching. Intensive Search Surveys should be employed to locate nests.

Broadcast Acoustical Survey

This method is based on broadcast of taped goshawk calls at points along transect routes to elicit responses from defensive territorial adult goshawks and their young. Often termed the "Kennedy-Stahlecker Protocol," it is currently the standard method used by the USDA Forest Service and many others. The efficacy of this method has been evaluated in terms of response rates at known successful nests (Joy et al. 1994, Kennedy and Stahlecker 1993, Watson et al. 1999), and recently at territories occupied by non-breeding goshawks (Keane and Woodbridge 2002).

Protocol

The protocol is based on the methods described by Kennedy and Stahlecker (1993), with refinements from Joy et al. (1994) and Watson et al. (1999). Adjustments to the number of surveys required and spacing of calling stations were made to optimize probability of detection and survey effort and cost.

- 1) Establishment of survey transects and stations.
Before initiating surveys, use aerial photographs and topographic maps to determine optimal placement of survey transects. Draw detailed maps of survey routes and station location and provide them to crews conducting surveys. When possible, establish start and end points of transects along existing roads, trails, streams, or other landforms. The maximum distance between parallel transects should be 250 m. Minimize number of stations located on roads, unless roads are entirely within the habitat of interest.
- 2) Call stations should be located 200 m apart along each transect. To increase coverage, offset station locations on adjacent transects by 100 m. The most important factor in transect and station placement is completeness of coverage; to achieve acceptable confidence in survey results, all suitable habitat should be within 150 m of a calling station.
- 3) For project surveys, the survey area should include the proposed project area plus an additional buffer beyond the project boundary. For projects involving significant modification of forest structure (e.g., commercial thinning), the survey should extend 800 m beyond the project boundary. This distance corresponds to the mean radius of the post-fledging area (about 200 ha) and will allow for detection of territories that overlap the project area. For projects that involve minor modification of forest structure (under-burning, light under--thinning, and light salvage) surveys need extend only 400 m beyond the project boundary.
- 4) Timing of surveys: Surveys should be conducted during the nestling and fledgling stages, including early postfledging dependency. This period corresponds to late May to mid-June to early July on the Monongahela National Forest (see Figure 1). Survey results might be unreliable after these dates. Surveys may begin half an hour before sunrise and should cease half an hour before sunset.

- 5) Calling procedure: At each calling station, broadcast at 60 degrees from the transect line for 10 seconds, then listen and watch for 30 seconds. Repeat this sequence two more times, rotating 120 degrees from the last broadcast. Repeat the three-call sequence again. After the last sequence, move to the next station. Move (walk) between stations at an easy pace, listening and watching carefully for goshawk calls and signs. The majority of time will be spent walking between stations, so it is important to be alert for goshawks approaching, often silently, to investigate the surveyor. Do not survey from vehicles or use vehicles to move between stations. Use of two observers will likely enhance the probability of visual detections of goshawks; however, experienced surveyors may conduct surveys singly. To avoid misidentifying broadcasts of coworkers, simultaneous surveys should be conducted no closer than two transect widths apart.

During the nestling stage, broadcast the adult alarm call.

During the late nestling and fledgling stages, broadcast the juvenile begging or wail call. This call is more likely to elicit responses from juvenile goshawks.

Do not survey under conditions such as high winds (greater than 15 mph) or rain that may reduce ability to detect goshawk responses. Record the detection type, compass bearing, station number, and distance from transect of any responses detected. Attempt to locate the goshawk visually and determine the sex and age (adult versus juvenile/fledgling) of the responding individual. To ensure consistency of data collection, a standard field data collection form (see end of this section) should be used.

WEST VIRGINIA NORTHERN FLYING SQUIRREL

Much of the proposed survey route is located within suitable WV northern flying squirrel (NFS) habitat, based on existing models/mapping of the area. Should species-specific surveys (e.g., trapping) be conducted within the study corridor, the MNF has a specific protocol which should be used (available upon request). However, it should be noted that a lack of NFS captures during a single survey does not provide evidence that the area is not suitable NFS habitat. Because existing habitat mapping is based largely on remotely sensed data, the presence or absence of suitable habitat needs to be confirmed in the field by a wildlife biologist whose qualifications have been approved by the MNF.

OTHER

Should field habitat surveys show evidence of suitable habitat for other TES species, additional species-specific protocols may be available from the MNF (e.g., Allegheny woodrats) for follow-up survey efforts.

Monongahela National Forest RFSS Animal Species

MONONGAHELA NF 2012 RFSS List	
MAMMALS	
<i>Microtus chrotorrhinus carolinensis</i>	Southern Rock Vole
<i>Myotis leibii</i>	Eastern Small-footed Myotis
<i>Myotis lucifugus</i>	Little Brown Myotis
<i>Myotis septentrionalis</i>	Northern Myotis
<i>Neotoma magister</i>	Allegheny Woodrat
<i>Perimyotis subflavus</i>	Tri-colored Bat
<i>Sorex dispar</i>	Long-tailed Shrew
<i>Sorex palustris punctulatus</i>	Southern Water Shrew
<i>Spilogale putorius</i>	Eastern Spotted Skunk
<i>Synaptomys cooperi</i>	Southern Bog Lemming
BIRDS	
<i>Accipiter gentilis</i>	Northern Goshawk
<i>Ammodramus henslowii</i>	Henslow's Sparrow
<i>Asio otus</i>	Long-eared Owl
<i>Contopus cooperi</i>	Olive-sided Flycatcher
<i>Falco peregrinus anatum</i>	American Peregrine Falcon
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Lanius ludovicianus migrans</i>	Migrant Loggerhead Shrike
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker
<i>Pooecetes gramineus</i>	Vesper Sparrow
<i>Vermivora chrysoptera</i>	Golden-winged Warbler
REPTILES	
<i>Crotalus horridus</i>	Timber Rattlesnake
<i>Glyptemys insculpta</i>	Wood Turtle
AMPHIBIANS	
<i>Aneides aeneus</i>	Green Salamander
<i>Cryptobranchus alleganiensis</i>	Eastern Hellbender
<i>Pseudotriton montanus</i>	Mud Salamander
INVERTEBRATES - ARACHNIDS	
<i>Apochthonius paucispinosus</i>	Dry Fork Valley Cave Pseudoscorpion
INVERTEBRATES - BIVALVES	
<i>Alasmidonta marginata</i>	Elktoe
<i>Lasmigona subviridis</i>	Green Floater
INVERTEBRATES - CRUSTACEANS	
<i>Caecidotea cannula</i>	Cannulate Cave Isopod
<i>Caecidotea holsingeri</i>	Holsinger's Cave Isopod

<i>Caecidotea simonini</i>	A Cave Obligate Isopod
<i>Caecidotea sinuncus</i>	A Cave Isopod
<i>Cambarus elkensis</i>	Elk River Crayfish
<i>Cambarus nerterius</i>	Greenbrier Cave Crayfish
<i>Stygobromus culveri</i>	Culver's Cave Amphipod
<i>Stygobromus emarginatus</i>	Greenbrier Cave Amphipod
<i>Stygobromus nanus</i>	Pocahontas Cave Amphipod
<i>Stygobromus parvus</i>	Minute Cave Amphipod
INVERTEBRATES - GASTROPODS	
<i>Fontigens tartarea</i>	Organ Cavesnail
INVERTEBRATES - INSECTS	
<i>Brachionycha borealis</i>	Boreal Fan Moth
<i>Calephelis borealis</i>	Northern Metalmark
<i>Cicindela ancocisconensis</i>	Appalachian Tiger Beetle
<i>Cicindela patruela</i>	Northern Barrens Tiger Beetle
<i>Cicindela purpurea</i>	Cow Path Tiger Beetle
<i>Erora laeta</i>	Early Hairstreak
<i>Erynnis lucilius</i>	Columbine Duskywing
<i>Euchlaena milnei</i>	A Geometrid Moth
<i>Gomphus quadricolor</i>	Rapids Clubtail
<i>Gomphus viridifrons</i>	Green-faced Clubtail
<i>Hadena ectypa</i>	A Noctuid Moth
<i>Hesperia metea</i>	Cobweb Skipper
<i>Lycaena hyllus</i>	Bronze Copper
<i>Pieris virginiensis</i>	West Virginia White
<i>Pseudanophthalmus fuscus</i>	A Cave Beetle
<i>Pseudanophthalmus hadenoecus</i>	Timber Ridge Cave Beetle
<i>Pseudanophthalmus hypertrichosis</i>	A Cave Beetle
<i>Pseudanophthalmus montanus</i>	Dry Fork Valley Cave Beetle
<i>Pseudosinella certa</i>	Gandy Creek Cave Springtail
<i>Pseudosinella gisini</i>	A Springtail
<i>Pyrgus wyandot</i>	Southern Grizzled Skipper
<i>Sinella agna</i>	A Springtail
<i>Speyeria diana</i>	Diana Fritillary
INVERTEBRATES - OTHER	
<i>Macrocotyla hoffmasteri</i>	Hoffmaster's Cave Planarian
<i>Phagocata angusta</i>	A Cave Obligate Planarian
<i>Pseudotremia fulgida</i>	Greenbrier Valley Cave Millipede
<i>Pseudotremia lusciosa</i>	Germany Valley Cave Millipede
<i>Pseudotremia princeps</i>	South Branch Valley Cave

	Millipede
<i>Sphalloplana culveri</i>	Culver's Planarian
<i>Zygonopus weyeri</i>	Grand Caverns Blind Cave Millipede
<i>Zygonopus whitei</i>	Luray Caverns Blind Cave Millipede



NORTHERN GOSHAWK DAWN ACOUSTICAL FIELD FORM
MONONGAHELA NATIONAL FOREST



LOCATION NAME _____ SITE No. _____

VISIT # _____

OBSERVERS _____

DATE _____ SUNRISE _____ START TIME _____ END TIME _____

WIND SPEED: 0 1 2 3 4 5 TEMP _____ ° F SKY CONDITIONS: 0 1 2 3 4
5 6 7 8

Beaufort#	Speed (MPH)	Indicator
0	less than 1	smoke rises vertically
1	1-3	smoke will drift
2	4-7	wind felt on face

Sky:	
0	clear or few clouds
1	partly cloudy
2	cloudy

GPS ID _____ UTM: N _____ E _____

BIRD Sp. HEARD VISUAL	# of BIRDS	AZM & DISTANCE	TYPE OF VOC.	TIME & LENGTH	Y	N
_____	_____	_____	_____ / _____	_____ / _____	_____	_____
_____	_____	_____	_____ / _____	_____ / _____	_____	_____
_____	_____	_____	_____ / _____	_____ / _____	_____	_____
_____	_____	_____	_____ / _____	_____ / _____	_____	_____
_____	_____	_____	_____ / _____	_____ / _____	_____	_____

BIRD SPECIES CODES: **VOCALIZATIONS:**

NOGO - NORTHERN GOSHAWK COHA - COOPER'S HAWK SSHA - SHARP-SHINNED HAWK **Kakking**

RTHA - RED-TAILED HAWK RSHA - RED-SHOULDERED HAWK BWHA - BROAD-WINGED HAWK **Wail**

OSPR - OSPREY CORA - COMMON RAVEN PIWO - PILEATED WOODPECKER

Repeated wail

BADO - BARRED OWL NSWOW - NORTHERN SAW-WHET OWL UNKN - UNKNOWN

Copulation Kakking

NOTES (If birds are seen but not heard vocalizing note the species here)

Field Form Checked and Complete Yes No if "No" date finished _____



**NORTHERN GOSHAWK BROADCAST ACOUSTICAL FIELD FORM
MONONGAHELA NATIONAL FOREST**



LOCATION NAME _____ #of
POINTS _____ VISIT # _____

OBSERVERS

DATE _____ START TIME _____ END TIME _____
WIND SPEED: 0 1 2 3 4 5 TEMP _____ ° F SKY CONDITIONS: 0 1 2 3 4 5 6 7
8

Beaufort#	Speed (MPH)	Indicator	Sky:
0	less than 1	smoke rises vertically	0 clear or few clouds
1	1-3	smoke will drift	1 partly cloudy
2	4-7	wind felt on face	2 cloudy

SPECIES (seen or heard) TIME	AZM & DISTANCE	# OF INDS	VISUAL ID	POINT
_____	_____	_____	Y N	_____
_____	_____	_____	Y N	_____
_____	_____	_____	Y N	_____
_____	_____	_____	Y N	_____
_____	_____	_____	Y N	_____

BIRD SPECIES CODES:

NOGO - NORTHERN GOSHAWK	COHA - COOPER'S HAWK	SSHA - SHARP-SHINNED HAWK
RTHA - RED-TAILED HAWK	RSHA - RED-SHOULDERED HAWK	BWHA - BROAD-WINGED HAWK
OSPR - OSPREY	CORA - COMMON RAVEN	PIWO - PILEATED WOODPECKER
BADO - BARRED OWL	NSWO - NORTHERN SAW-WHET OWL	UNKN - UNKNOWN

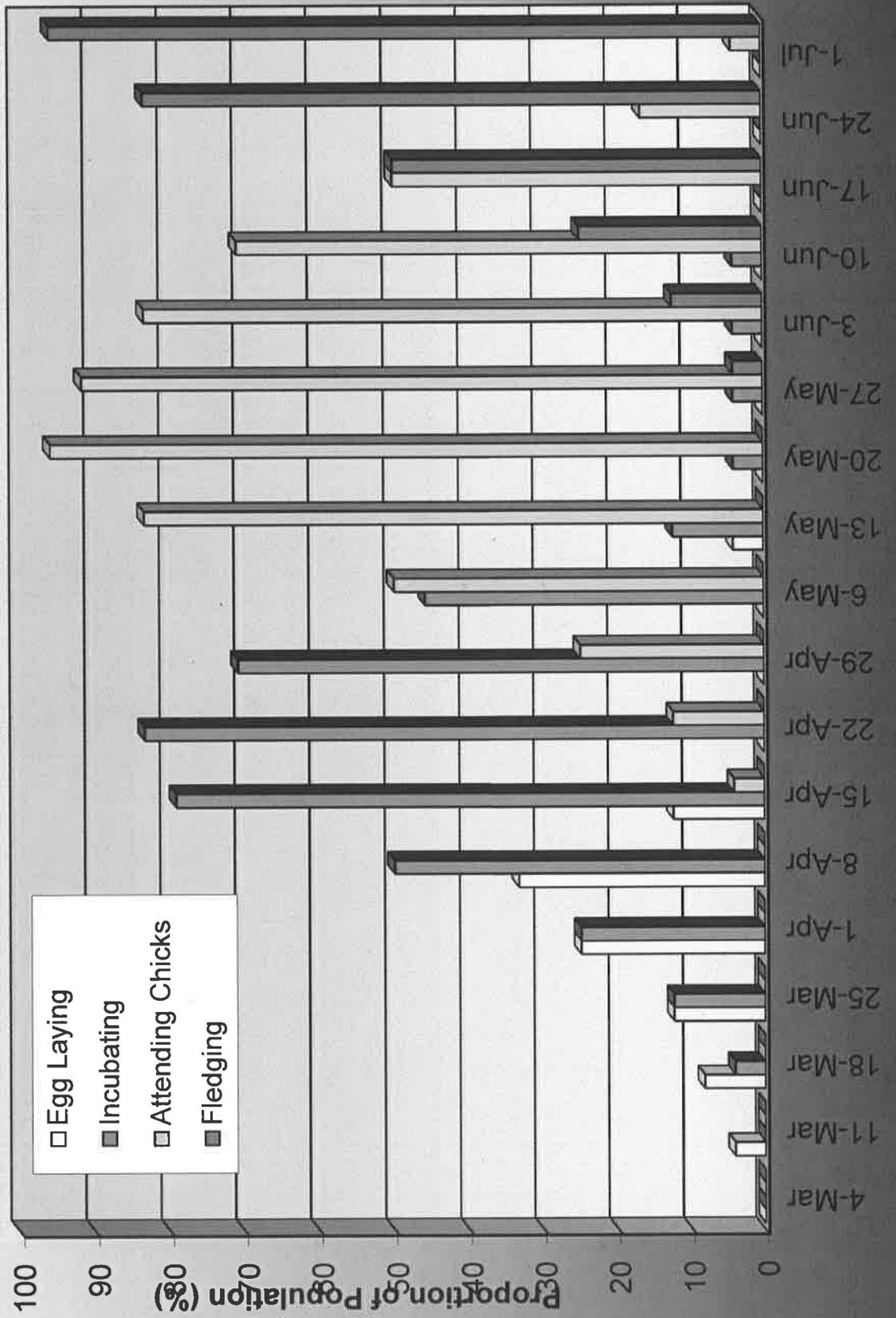
GOSHAWK EVIDENCE FOUND AND IMPORTANT LOCATION INFORMATION (prey, NOGO feathers, nest)

ITEM DESCRIPTION	GPS ID	UTM LOCATION
E _____	_____	N _____
E _____	_____	N _____
E _____	_____	N _____
E _____	_____	N _____

Form Checked and Complete Yes No if "No" date finished _____

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Central Appalachian Goshawk Nesting Phenology



Botanical Resources

Four federally listed and sixty one Regional Forester's Sensitive Species (RFSS) plants have been documented on the Monongahela National Forest (MNF), and are collectively referred to as TES (Threatened, Endangered, and Sensitive) species. A full list is provided at the end of this section. A variety of non-native invasive plants (NNIS) are also present on the Forest, and are also listed at the end of this section.

Office and field botany surveys will need to be conducted in the areas to be surveyed for the ACP proposed route(s) to locate and document occurrences of any of these species, as well as sensitive habitats likely to host TES species. These sensitive habitats include seeps, cliffs and rock outcroppings, shale barrens, wetlands, etc. These surveys must be done by a competent botanist who demonstrates a high level of skill in identifying all plants that are likely to be encountered in West Virginia mountain forests. The Forest Service can assist in evaluating the qualifications of prospective botanists.

The survey should be conducted according to the specifications below. The survey should cover all areas on National Forest land that might be affected directly or indirectly by the proposed project (see discussion of areal survey coverage in the Introduction).

The Forest Service may accompany botanists into the field from time to time and will review the survey results upon completion.

Survey methodology

It is recommended that survey coverage be distributed along the entire length of the survey corridor on National Forest land in survey segments up to but no longer than one mile each. Coverage of any areas outside the survey corridor that could be affected by the proposed project should be coordinated with the Forest Service on a case-by-case basis. For the purposes of species list documentation and survey data forms, each contiguous major forest community patch should be considered a survey unit. Major forest communities on the MNF include mixed mesophytic/cove hardwoods, oak, northern hardwoods, oak-pine, hemlock, spruce, and riparian. They are described in Chapter 3 of the Forest Plan EIS, and are approximately delineated in a GIS layer which will be provided to botanists conducting the survey. In cases where isolated parcels of National Forest land less than one mile long are to be surveyed, each isolated parcel, or the forest community patches therein, will be considered a survey unit.

All identified survey units should be thoroughly surveyed on foot by the meander method. Survey routes should cross drainages and side ridges to provide good coverage of all of the different habitats present in each survey unit. Survey coverage as depicted by the GPS route documentation should average at least 100 linear feet per acre for each unit surveyed and should be distributed across the unit.

Efforts should be focused on those habitats that, in the judgment of the botanist, are most likely to harbor TES plants listed at the end of this section. However, all habitats should be traversed and described, and **it is highly recommended that the botanists compile a list of all herbaceous, vine, tree, and shrub species found in each survey unit.**

While conducting the survey, the botanist should also report conditions found within each survey unit, regardless of the presence or absence of TES and NNIS plant species. Remarks of this type should include: general ecological characterization of the site, notation of erosional features, evidence of herbivory, rock outcrops and ledges, large areas of blowdown, seeps, wetlands, and other sensitive and rare habitats, and presence of old roads within the survey unit. The botanist should also report incidental encounters of TES plants or high priority NNIS while traveling between survey units within the project boundary.

The FS can provide a Likelihood of Occurrence table to help the botanist focus survey efforts toward likely habitats for TES plant species. The botanist should supplement this table with personal knowledge of habitat requirements and an evaluation of soil type, land type association, aspect, slope, etc. The botanist may suggest changes to the Likelihood of Occurrence table, but is not required to provide additional information for the table. A determination of “not likely to occur” should not be construed as a guarantee that a species will not occur in one of the survey units.

Field surveys in high probability habitat for running buffalo clover should take place between June 1 and August 15, inclusive (per Forest Plan direction). Field surveys outside high priority habitat for running buffalo clover should take place between June 1 and September 30, inclusive. (USDA, 2006). Survey units should be visited at least once during this time, but may be visited more than once. If high potential habitat for a particular TES plant species is present, a re-check may be needed during the time best suited for identification. The FS can provide maps that depict approximate locations of high probability habitat for running buffalo clover.

For all surveys, the botanist should use a mapping grade global positioning system (GPS) unit with computer downloading capabilities to:

- Document survey routes through each area that is surveyed. Minor gaps in route documentation due to inadequate satellite coverage or unfavorable Dilution of Precision are expected; however, GPS route documentation should be thorough enough to demonstrate good coverage of each unit. Route documentation should have a horizontal accuracy of 10 meters or less.
- Record site locations for each population of TES plants found. All GPS locations should have a horizontal accuracy of 5 meters or less, and documentation of accuracy, such as that typically contained in differentially corrected GPS data files, should be provided. Recreational grade GPS units generally are not capable of this level of accuracy.

For each survey unit, the botanist should:

- Report all herbaceous, shrub, tree, and vine species encountered on a separate electronic species list data form for that survey unit.
- Provide GPS documentation of the survey route walked according to the specifications listed above. A single line feature should represent the path of travel in each survey unit, unless multiple visits are made to a unit, in which case the route file may contain a separate line feature for each visit. Route files should be “cleaned” to remove any errant outlier vertices that obviously do not lie on the actual path of travel, as well as spurious lines connecting distant points that do not represent a path actually walked on the ground.

For all TES plant sites found in the survey units, the botanist should:

- Provide GPS location data with a horizontal accuracy of 5 meters or less. For populations that are less than 50 feet long in their longest dimension, a single GPS point near the approximate center of the population will suffice. For populations that are greater than 50 feet long in their longest dimension, GPS points that form a rough polygon around the population should be collected. Precise delineation of convoluted population boundaries is not required.
- Multiple small patches of the same species within a contiguous habitat patch (e.g., a TES species scattered across a talus slope) may be treated as one population and depicted by a polygon surrounding the multiple locations. Alternatively, each of the multiple patches may be represented by an individual GPS point if this results in less effort for the botanist.

For all high priority NNIS plant sites found in the survey units, the botanist should:

- Provide GPS location data using the same standards outlined above for delineating TES plant populations. However, multiple locations along a road, trail, etc. that do not extend into the adjacent off-road habitat may be depicted by a line, accompanied by a description of the density and distribution along that line.

For all low priority NNIS plants found in the survey units:

- All low priority NNIS found should be included in the overall species list for that survey unit. GPS locations are not necessary for low priority NNIS, unless, in the judgment of the botanist, these species appear to threaten the ecological integrity of the survey unit or adjacent habitats. The nature and extent of the threat should be explained in the final report.

For any incidental observations of TES and high priority NNIS plants while traveling between survey units within the project boundary, the botanist should:

- Provide a single GPS point located at the center of populations that are less than 50-feet long in the longest dimension.
- Provide a sketch or GIS feature (line or polygon) depicting the approximate extent of any population greater than 50 feet in length in the longest dimension. The sketch or GIS feature does not have to be based on GPS data.
- Multiple small patches of the same species within a contiguous habitat patch (e.g., a TES species scattered across a talus slope or a NNIS scattered along a roadside) may be treated as one population and depicted by a sketch or GIS feature of the approximate extent. The sketch or GIS feature does not have to be based on GPS data.
- Low priority NNIS observed while traveling between survey units need not be reported unless they appear to threaten the integrity of the ecosystem in which they occur.

Threatened, Endangered, Sensitive, and non-Native Invasive Plant Species

Threatened and Endangered Plant Species

These plants have been found on the Monongahela and are federally listed as either Threatened (T) or Endangered (E).

Scientific Name	Common Name
<i>Arabis serotina</i>	Shale-barren rock cress (E)
<i>Isotria medeoloides</i>	Small whorled pogonia (T)
<i>Spiraea virginiana</i>	Virginia spirea (T)
<i>Trifolium stoloniferum</i>	Running buffalo clover (E)

Regional Forester's Sensitive Plant Species

These plants have been identified by the Regional Forester as species for which population viability is a concern, as evidenced by significant current or predicted downward trend in numbers and density, or by habitat capability or trend that would reduce the species' existing distribution. RFSS include, but are not limited to, USFWS candidate species, species de-listed by the USFWS in the last five years, and species with NatureServe Global, Trinomial or National Ranks of G1-G3, T1-T3 or N1-N3. Certain species with a state rank of S1 or S2 may also be included.

Scientific Name	Common Name
<i>Agrostis mertensii</i>	Arctic Bentgrass
<i>Allium allegheniense</i>	Allegheny Onion
<i>Allium oxypetalum</i>	Lillydale Onion
<i>Amelanchier bartramiana</i>	Bartram Shadbush
<i>Arabis patens</i>	Spreading Rockcress
<i>Astragalus neglectus</i>	Cooper's Milkvetch
<i>Baptisia australis</i> var. <i>australis</i>	Blue Wild Indigo
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf Grapefern
<i>Botrychium oneidense</i>	Bluntlobe Grapefern
<i>Carex roanensis</i>	Roan Mountain Sedge
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple Clematis
<i>Corallorhiza bentleyi</i>	Bentley's Coralroot
<i>Cornus rugosa</i>	Roundleaf Dogwood
<i>Cypripedium reginae</i>	Showy Lady's-slipper
<i>Delphinium exaltatum</i>	Tall Larkspur
<i>Eriogonum alleni</i>	Shalebarren Wild-buckwheat
<i>Euphorbia purpurea</i>	Darlington's Spurge
<i>Gaylussacia brachycera</i>	Box Huckleberry
<i>Gymnocarpium appalachianum</i>	Appalachian Oak Fern
<i>Hasteola suaveolens</i>	Sweet-scented Indian-plantain
<i>Heuchera alba</i>	White Alumroot
<i>Hexalectris spicata</i>	Crested Coralroot

<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort
<i>Ilex collina</i>	Long-stalk Holly
<i>Juglans cinerea</i>	Butternut
<i>Juncus filiformis</i>	Thread Rush
<i>Juncus trifidus</i>	Highland Rush
<i>Liatris turgida</i>	Turgid Blazing Star
<i>Linum sulcatum</i>	Grooved Yellow Flax
<i>Listera cordata</i>	Heartleaf Twayblade
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons
<i>Menyanthes trifoliata</i>	Bog Buckbean
<i>Monarda fistulosa</i> ssp. <i>brevis</i>	Smoke Hole Bergamot
<i>Ophioglossum engelmannii</i>	Limestone Adder's-tongue
<i>Paronychia argyrocoma</i>	Silvery Nailwort
<i>Paronychia virginica</i>	Yellow Nailwort
<i>Paxistima canbyi</i>	Canby's Mountain-lover
<i>Pedicularis lanceolata</i>	Swamp Lousewort
<i>Phlox buckleyi</i>	Swordleaf Phlox
<i>Piptatherum (=Oryzopsis) canadense</i>	Canada Mountain Ricegrass
<i>Platanthera shriveri</i>	Shriver's Frilly Orchid
<i>Poa paludigena</i>	Bog Bluegrass
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder
<i>Potamogeton tennesseensis</i>	Tennessee Pondweed
<i>Pycnanthemum beadlei</i>	Beadle's Mountainmint
<i>Ranunculus pennsylvanicus</i>	Pennsylvania Buttercup
<i>Rhamnus lanceolata</i> ssp. <i>lanceolata</i>	Lanceleaf Buckthorn
<i>Ribes lacustre</i>	Bristly Black Currant
<i>Scutellaria saxatilis</i>	Rock Skullcap
<i>Silene virginica</i> var. <i>robusta</i>	Fire Pink
<i>Stellaria borealis</i> ssp. <i>borealis</i>	Boreal Starwort
<i>Taenidia montana</i>	Mountain Pimpernel
<i>Taxus canadensis</i>	Canada Yew
<i>Tortula ammonsiana</i>	Ammons' Tortula Moss
<i>Trichomanes boschianum</i>	Bristle-fern
<i>Trichostema setaceum</i>	Narrow-leaved Blue-curls
<i>Trifolium virginicum</i>	Kate's Mountain Clover
<i>Triphora trianthophora</i>	Nodding Pogonia
<i>Viola appalachiensis</i>	Appalachian Blue Violet
<i>Vitis rupestris</i>	Sand Grape
<i>Woodwardia areolata</i>	Netted Chainfern

High Priority non-native invasive plant species

These species have the capability to invade forested ecosystems or other high quality habitats in the project area, or they may interfere with tree regeneration. These species should be GPS-located wherever they occur.

Scientific Name	Common Name
<i>Acer platanoides</i>	Norway maple
<i>Ailanthus altissima</i>	tree of Heaven
<i>Alliaria petiolata</i>	garlic mustard
<i>Ampelopsis brevipedunculata</i>	porcelain berry
<i>Arthraxon hispidus</i>	jointed grass or small carpgrass
<i>Berberis thunbergii</i>	Japanese barberry
<i>Bromus commutatus</i>	hairy chess or meadow brome
<i>Butomus umbellatus</i>	flowering rush
<i>Celastrus orbiculata</i>	Oriental bittersweet
<i>Coronilla varia</i>	crown vetch
<i>Dioscorea oppositifolia</i>	Chinese yam
<i>Hydrilla verticillata</i>	hydrilla
<i>Iris pseudacorus</i>	yellow iris or yellow flag
<i>Ligustrum vulgare</i> , <i>L. sinense</i> , <i>L. japonica</i> , <i>L. obtusifolium</i>	exotic privets
<i>Lonicera japonica</i> , <i>L. maackii</i> , <i>L. morrowii</i> , <i>L. tatarica</i> , <i>L. tatarica</i> .x <i>L. morrowii</i>	Japanese honeysuckles
<i>Lysimachia nummularia</i>	moneywort or creeping jenny
<i>Lythrum salicaria</i>	purple loosestrife
<i>Microstegium vimineum</i>	Japanese stiltgrass
<i>Paulownia tomentosa</i>	princess-tree
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Polygonum perfoliatum</i>	mile-a-minute vine
<i>Polygonum sachalinense</i>	sachaline or giant knotweed
<i>Pueraria lobata</i>	kudzu
<i>Ranunculus ficaria</i>	lesser celandine or fig buttercup
<i>Rhamnus cathartica</i>	common buckthorn
<i>Rhodotypos scandens</i>	jetbead
<i>Rubus phoenicolasius</i>	wineberry
<i>Sorghum halepense</i>	Johnsongrass
<i>Vinca major</i>	bigleaf periwinkle
<i>Vinca minor</i>	common periwinkle

Non-native invasive plant species that may be considered problematic in certain special habitats (e.g., wetlands, glades, barrens, wildlife openings, range allotments, etc.).

These species should be GPS-located if they occur in a habitat where they can cause resource damage.

Scientific Name	Common Name
<i>Amaranthus hybridus</i>	common pigweed or green amaranth
<i>Anthoxanthum odoratum</i>	sweet vernal grass
<i>Arctium minus</i>	lesser burdock
<i>Barbarea vulgaris</i>	winter cress or yellow rocket
<i>Bromus inermis</i> var. <i>inermis</i>	smooth brome
<i>Bromus sterilis</i>	barren brome grass or poverty brome
<i>Bromus tectorum</i> var. <i>tectorum</i>	downy chess or cheatgrass
<i>Carduus acanthoides</i>	plumeless thistle
<i>Carduus crispus</i>	curled thistle
<i>Carduus nutans</i>	musk thistle
<i>Centaurea nigrescens</i> (<i>C. pratensis</i>)	Tyrol knapweed (meadow knapweed)
<i>Centaurea stoebe</i> ssp. <i>micranthos</i> (<i>C. maculosa</i>)	spotted knapweed
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy
<i>Cichorium intybus</i>	chicory
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium vulgare</i>	bull thistle
<i>Clerodendrum trichotomum</i>	harlequin glorybower
<i>Daucus carota</i>	Queen Anne's lace
<i>Dipsacus laciniatus</i>	cut-leaved teasel
<i>Dipsacus sylvestris</i>	common teasel
<i>Echium vulgare</i>	viper's bugloss
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Elaeagnus umbellata</i>	autumn olive
<i>Elytrigia repens</i>	Quackgrass
<i>Epipactis helleborine</i>	broadleaf helleborine
<i>Euphorbia esula</i>	leafy spurge
<i>Festuca arundinacea</i>	Kentucky 31 fescue
<i>Festuca elatior</i>	tall fescue
<i>Festuca pratensis</i>	meadow fescue
<i>Glechoma hederacea</i>	ground ivy or gill-over-the-ground
<i>Heracleum mantegazzianum</i>	giant hogweed
<i>Hesperis matronalis</i>	Dame's rocket
<i>Hieracium pratense</i>	king devil or field hawkweed
<i>Holcus lanatus</i>	velvet grass
<i>Hypericum perforatum</i>	common St. John's wort
<i>Lespedeza bicolor</i>	Japanese bushclover
<i>Lespedeza cuneata</i>	sericea lespedeza
<i>Melilotus alba</i>	white sweet clover

<i>Melilotus officinalis</i>	yellow sweet clover
<i>Muscari botryoides</i>	grape hyacinth
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil
<i>Ornithogalum nutans</i>	drooping star of Bethlehem
<i>Ornithogalum umbellatum</i>	star of Bethlehem
<i>Perilla frutescens</i>	beefstakeplant
<i>Phalaris arundinacea</i>	reed canary grass
<i>Phleum pratense</i>	Timothy
<i>Plantago lanceolata</i>	English plantain or narrow-leaf plantain
<i>Plantago major</i>	great plantain
<i>Poa compressa</i>	Canada bluegrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Poa trivialis</i>	rough bluegrass
<i>Polygonum aviculare</i>	knotweed
<i>Polygonum caespitosum</i>	Asiatic water pepper
<i>Poncirus trifoliata</i>	hardy orange
<i>Potamogeton crispus</i>	curly pondweed
<i>Rorippa sylvestris</i>	creeping yellow cress
<i>Rosa multiflora</i>	multiflora rose
<i>Rumex acetosella</i>	sheep sorrel
<i>Rumex crispus</i>	yellow dock or curly dock
<i>Spiraea japonica</i>	Japanese spiraea
<i>Stellaria media</i>	common chickweed
<i>Tussilago farfara</i>	Colt's-foot
<i>Verbascum thapsus</i>	great mullein

Literature Cited

Strausbaugh, P. D. and E. L. Core. 1978. Second edition. Seneca Books, Inc., Morgantown, WV.

USDA Forest Service. 2006a. *Monongahela National Forest Final Environmental Impact Statement for Forest Plan Revision*. USDA Forest Service, Eastern Region, Milwaukee, WI.

USDA Forest Service. 2006b. *Monongahela National Forest Land and Resource Management Plan*. USDA Forest Service, Eastern Region, Milwaukee, WI.

Minerals and Geology

The following are recommendations for the survey, investigation and collection of geologic and mineral related information needed for analysis of the proposed project.

A. Geology

Identify, investigate and map the extent of any known or unknown hazard geology along the proposed pipeline route. Describe and identify any geologic conditions, and characteristics that may cause concerns for the construction, operations and maintenance of the pipeline.

Likewise, identify, investigate and map the extent and depth of any sinks, sinkholes, caves that may exist within or near the proposed pipeline route, staging area and associated new roads. Additional geophysical investigations at such identified areas may be needed to facilitate a decision on the proposed pipeline. Please note that all caves and other karst features on the MNF are closed to entry. If data collection requires entry, separate written authorization from the Forest Supervisor will be required.

Alternative routes MNF 1 and MNF 2 along the eastern side of Cheat Mountain have known karst within the Greenbrier Limestone of the Pottsville Group- Pink Helicite Cave and possibly Hook Cave are within the proposed route. Other Alternatives routes (southern) go through large amounts of Greenbrier Limestone (mostly off-Forest) with springs and caves too.

The project may also cross sensitive lithologic units known for unstable slope, i.e. the Mauch Chunk Group . The steep terrain through many areas of the proposed route(s) and steeply dipping formations may affect soil stability, erosion potential , reclamation and revegetative success. See slope stability survey recommendations in the Soil and Hydrology sections of this document.

B. Minerals

Identify, investigate and map any old natural gas wells within or near the proposed pipeline route

Pipeline construction and excavation activities may intersect reclaimed natural gas wells affecting the plugged borehole and exposing encapsulated pit material. Such pit material could have elevated concentrations of chemicals.

There are several natural gas wells 3-5 drilled by Union Drilling in the 1980s in the Lambert Run area which is now NFS lands. None were successful and they were appropriately plugged, reclaimed and abandoned.

Identify, investigate and map any surface coal mines, workings, spoil piles, abandoned facilities within or near the proposed pipeline route. Coal spoil/waste that is intersected by the proposed pipeline route needs to be identified, extent mapped and tested for acid generating potential, heavy metals, and any other potential components of concern.

Old Coal Mine/Strip Workings

Construction activities from the pipeline project (digging 5-12 feet in depth) may expose already reclaimed and stabilized acid generating coal spoil piles from the former strip mining of the area.

Construction activities may intersect old underground coal mine workings that exist close to the surface allowing for water interaction, transmission of fluids and cross connectivity issues affecting water quality and water quantity. These construction activities may also release vast volumes of unknown trapped water existing within the mine workings affecting the water table in the area. Proper mapping using mine maps (see State of WV) and avoidance is recommended.

Identify, investigate and map any known or discovered landfills, and underground mine workings

Pipeline construction may unknowingly intersecting improperly disposed or discarded mine related fluids or hazardous materials in underground workings.

Identify, investigate and map the geology of any major stream crossings

Boring under streams and rivers may intersect un-mined coal units or other soft units or limestone units that could allow for unstable pipeline bedding, water interaction, transmission of fluids through cracks and fractures and cross connectivity issues affecting water quality and water quantity. See also survey recommendations in the Hydrology section of this document.

References

Medville, Douglas M. and Hazel E. Medville. 1995. Caves and Karst of Randolph County. West Virginia Speleological Survey Bulletin 13. 250 pp.

Reger, David B. 1931. West Virginia Geological Survey Randolph County Report, 989 pp.

Reger, David B. 1931. Randolph County General and Economic Geology Map, West Virginia Geological Survey.

USDA-FS Engineering Staff. 1994. Slope Stability Reference Guide for National Forests in the United States, Volumes I-III. EM-7170.

Links-

West Virginia Geologic and Economic Survey. Geology Interactive Mapping Portal for oil, gas, coal

<http://ims.wvgs.wvnet.edu/index.html>

Mine Information Data System (MIDS)

http://www.wvgs.wvnet.edu/www/coal/MIDS_Index.htm

Soils

The surveys needed for the soil resource include a site specific order 1 level soil survey within the corridor. See also the discussion in the Introduction regarding the aerial extent of surveys for resources that may be impacted directly or indirectly. An Order 1 Soil Survey is defined by the USDA NRCS in the referenced document.

http://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2_054252

This task would need to be performed by a professional journey level soil scientist with experience in soil mapping and description in the Eastern US. Expertise in the Appalachian region (Georgia-Maine) is preferred.

- The following data would need to be collected as part of this order 1 soil survey:
 - Information and data that can be used in analysis to determine soil stability and predictions for erosion and sediment control.
 - Slope
 - Soil type
 - Soil mineralogy
 - Depth to bedrock and bed rock structure/ dip slope
 - Presence of pans
 - Indications of past slope failures both natural and those attributed to anthropogenic disturbance such as road building, logging, mining and other activities.
 - Presence of subsurface water tables
 - Description of the organic horizons and an assessment of below ground carbon stocks related to the soil types within the corridor to account for loss of stored carbon stocks as well as sensitive organic horizons that act to store carbon and water and are part of niche biological habitats (e.g., folistic epipedons and spodic horizons in current and former spruce and hemlock forests).
 - Soil chemistry assessments for the presence of base poor soils as required by the Forest plan. This is mainly soil types that form over the Pottsville geology but are not limited to this formation.

In addition, the following document should be used as a tool in guiding additional data collection for determining slope stability on USFS lands.

Prellwitz, Rodney W.; Koler, Thomas E.; and Steward, John E., coords. 1994. **Slope Stability Reference Guide for National Forests in the United States**. Publication EM-7170-13. Washington, DC: U.S. Department of Agriculture, U.S. Forest Service, Engineering Staff. 3 volumes, 1091 p

Hydrology

The installation of a pipeline through the forest and across mountains, streams, and other features would result in certain hydrologic impacts.

1. There is a potential for the proposed pipeline to produce impacts/damage to wetlands (swamps, bogs, springs/seeps, etc.), streams, floodplains, wells, and public water supplies. Data sufficient to elucidate these impacts should be collected. This includes not only those features located directly within the corridor but also those features adjacent to corridor that have the potential to be impacted or affected (see discussion of areal extent of surveys in the Introduction). Surveys related to these issues should include the following:
 - a. Wetland present in and adjacent to the corridor should be delineated according to the *Corps of Engineers Wetland Delineation Manual, 1987*. The total acreage of the wetland should be provided, in addition to acreage located directly in the corridor. The delineation should encompass not only those “jurisdictional” wetlands, but also wetlands not under the jurisdiction of the Clean Water Act, such as isolated wetlands.
 - b. Identification, inventory and assessment of all streams (perennial, intermittent, and ephemeral), springs/seeps, bogs, fens, swamps, etc. be included and be done by accepted methods and in a manner such that the potential for impacts can be analyzed and reviewed by the MNF and the public.
 - c. A functional assessment conducted to analyze the size and functional value of the wetlands that would be affected by the proposed pipeline.
 - d. During the survey, as resources are evaluated, ACP should consider if mitigation would be possible for the highest quality resources at risk (e.g. those resources that are assigned the most stringent level of protection by WVDEP – such as Tier 3 vs. Tier 2 streams and the WVDEP’s designated use category, etc.).
 - e. Inventory wells and public water supplies (if any) in and adjacent to the corridor. Depending on surface and groundwater flow characteristics, such supplies could be located some distance away from the corridor.
2. There is a potential for impacts to stream bed and bank form, bed material, water quality, etc. The following surveys would give useful information for the project analysis and for being able to adequately address comments and concerns that are received.
 - a. Bed material composition (including above and below crossing) – (e.g. Wolman Pebble count)
 - b. Substrate embeddedness (above and below crossing)
 - c. Bank stability survey – (include photos)
 - d. Cross-sectional survey (at least at larger crossings)
 - e. Water quality – TDS, turbidity, nutrients (P, N), conductivity, stream temperature, DO
3. Analyze steep slopes and areas close (within approximately 300’) to streams for slope stability and for their erosion potential.
 - a. Slope stability
 - b. Soil erosion potential
 - c. In a recent consent order, WVDEP required a geotechnical analysis to define the root cause(s) of historical pipeline right-of-way failures, and to provide a written report of its findings and a plan of corrective actions to address the root cause(s) of pipeline right-of-way failures. The results of this analysis would likely be useful to guide the need for additional analyses for this survey.

4. Intercepting shallow groundwater and expressing it to the surface and altering its natural flow path are a potential concern, especially where the ground contour is altered, such as deep water bars or access routes that generate cut slopes.
5. Because of the interconnected network of sinkholes, caves, voids, fractures, etc. in karst environments, actions in one area can produce impacts considerable distance for the actual point of activity, thus surveys where the corridor crosses karst terrain or limestone should include the following
 - a. Survey for the presence of sinkholes within the corridor and ¼ mile beyond the corridor on either side.
 - b. Surveys for the presence of sub-surface features and potential flow paths – caves, voids, faults/fractures/joints, etc. (dye tracing, geophysical methods, etc. may be necessary in order to understand the subsurface flow paths)

Note that caves and all other karst features on the MNF are closed to entry. If any surveys require entry, separate written authorization from the Forest Supervisor will be required.

6. The proposed pipeline route crosses a “priority watershed”, the West Fork Greenbrier River sub-watershed (6th level “hydrologic unit code” or HUC) of the Deer Creek – Greenbrier River watershed (5th level HUC). A priority watershed is one that has been selected for watershed improvement projects because improvements in that watershed can improve the overall environmental condition of a larger landscape-scale area. The MNF is currently in the process of implementing several significant watershed improvement activities, both within this priority watershed and within other adjacent priority watersheds, which will move the watersheds toward their “desired conditions”, and thereby improve the larger landscape-scale environment. Although the proposed pipeline route directly crosses only the one priority watershed mentioned above, it does cross streams immediately downstream of the other two priority watersheds (East Fork Greenbrier River and Little River watersheds), and thus may partially negate the positive results to the larger landscape-scale environment provided by the watershed improvement projects (both completed and planned) within these other two priority watersheds.. Projects currently being implemented on the Deer Creek – Greenbrier River watershed to make this landscape-scale watershed improvement include: 1) decommissioning approximately 118 miles of roads and trails, 2) upgrade road maintenance on 20 miles of road, 3) 197 miles of in-stream habitat restoration and enhancement, 4) remove 42 barriers to aquatic organism movement and migration by replacing or removing culverts and other passage barriers, and 5) 660 acres of riparian forest replanting and enhancement. These projects will improve the aquatic and riparian conditions either directly (e.g. in-stream habitat and riparian habitat improvements), or indirectly (e.g. reducing erosion and sedimentation by decommissioning unnecessary roads and trails).
 - a. Surveys should collect information that will allow an assessment of the effects of the pipeline project on these facets of watershed hydrology and aquatic habitat (e.g. erosion and sedimentation, riparian habitat and conditions, in-stream and aquatic habitat and conditions), such that the net impact to these can be evaluated.

Fisheries/Aquatic Ecology

The proposed study corridor for the ACP crosses through several sub-watersheds on the MNF. Among these is the Forest's highest priority area for watershed restoration – the upper Greenbrier River. The MNF is three years into investing millions of dollars to secure favorable watershed conditions needed to improve aquatic habitats and sustain diverse, native aquatic assemblages that remain relatively intact in the upper Greenbrier River system. Although the proposed study corridor would not appear to directly impact specific watershed/aquatic restoration sites in the upper Greenbrier River, potential indirect and cumulative effects associated with pipeline construction, operations and maintenance could undermine some of the watershed health benefits associated with on-going restoration work.

Table 1 contains aquatic resource issues that should be considered as part of the analyses of potential direct, indirect, and cumulative effects associated with the ACP proposal for sub-watersheds on the MNF. These suggestions may not be all encompassing and neither are they intended to be prescriptive regarding specifications for the type or extent of information that might be needed to analyze the ACP proposal. However, the suggestions may be useful for developing an aquatic resource evaluation plan and identifying appropriate protocols for acquiring any information that is deemed necessary. It is expected that protocols used to conduct field assessments for aquatic resources would be coordinated with the designated Forest aquatic resource specialist(s) to discuss and attain protocol efficacy and data utility.

Information that may be needed to address aquatic resource issues for a possible ACP proposal should span all areas that could be affected including the pipeline corridor, support facilities, staging areas, short-term ingress/egress routes, and access routes needed for long-term operation/maintenance of the proposed pipeline (see discussion in the Introduction regarding the areal extent of surveys).

Table 1. Potential aquatic resource issues, attributes of particular interest, potential for adverse effects, and recommended information gathering.

Aquatic Resource Issue	Attribute of Interest	Potential for Adverse Effects Associated with Pipeline Alternative	Recommended Information Gathering
Watershed Health	alterations	high	characterize
Aquatic Environments	wetlands	high	locate, characterize
	perennial streams	high	locate, characterize
	intermittent streams	high	locate, characterize
	ephemeral streams	high	locate, characterize
	springs/seeps	high	locate, characterize
	karst (sinkholes)	high	locate, characterize
Clean Water Act	anti-degradation	high	characterize
	designated uses	high	characterize
Water Quality	water chemistry	moderate	establish baseline
	stream turbidity	high	characterize

Aquatic Resource Issue	Attribute of Interest	Potential for Adverse Effects Associated with Pipeline Alternative	Recommended Information Gathering
	stream temperature	low	characterize
Water Quantity	hillslope hydrology	high	characterize
	in-stream flows	high	characterize
Stream Channel Characteristics	fluvial geomorphology	high	establish baseline
	bed/bank stability	high	establish baseline
	substrate composition	high	establish baseline
	substrate embeddedness	high	establish baseline
	habitat composition	high	establish baseline
Aquatic Management Indicator Species (and Suitable Habitat)	wild trout (particularly brook trout)	high	presence/absence, characterize
Aquatic Regional Forester's Sensitive Species (or Suitable Habitat)	pearl dace	low	presence/absence, characterize
	Cheat minnow	low	presence/absence, characterize
	candy darter	high	presence/absence, characterize
	Appalachian darter	high	presence/absence, characterize
	New River shiner	high	presence/absence, characterize
	Kanawha minnow	high	presence/absence, characterize
	pearl dace	high	presence/absence, characterize
	eastern hellbender	high	presence/absence, characterize
	green floater (mussel)	moderate	+ presence/absence, characterize
	elktoe (mussel)	moderate	+ presence/absence, characterize
	^R cave/karst-dwelling species	moderate	presence/absence, characterize
^R Order Odonata	moderate	presence/absence, characterize	
Recently	Greenbrier River	high	# presence/absence,

Aquatic Resource Issue	Attribute of Interest	Potential for Adverse Effects Associated with Pipeline Alternative	Recommended Information Gathering
Described Species	crayfish (<i>Cambarus smilax</i>)		characterize
Critical Stages of Life History	aquatic species listed above	moderate	potential for design considerations
Aquatic Passage	Aquatic community	low	potential for design considerations

+ coordinate with West Virginia Division of Natural Resources for appropriate consideration mussel species

coordinate with Dr. Zach Loughman at West Liberty University for appropriate consideration of the Greenbrier River crayfish

R see Regional Forester's Sensitive Species list for Forest Service Region 9

Recreation and Scenery

ACP should analyze and document the potential effects of the proposed project to:

- Existing developed and dispersed recreation sites
- Existing trails
- Planned trails (specifically in the Mower Tract, on Cheat-Back Allegheny Mountain)
- Wilderness and Wilderness Study Areas (in particular Roadless Area Conservation Rule areas)
- Scenery and Visual Quality
- Eligible Wild and Scenic Rivers (specifically the Shavers Fork River)
- Visitor safety – during construction and operation

Information needed to analyze the effects of proposed pipeline construction/operation on the Shaver's Fork outstanding values of scenery and recreation should be collected, including:

- Direct and indirect effects to recreation
- Direct effects to Visual Quality using the Scenery Management System.
http://www.fs.fed.us/cdt/carrying_capacity/landscape_aesthetics_handbook_701_no_append.pdf

APPENDIX 3

Notes from the Meeting between Forest Service and ACP on July 5, 2015

ATLANTIC COAST PIPELINE PROJECT MEETING MINUTES



MEETING WITH (COMPANY/AGENCY):

U.S. Forest Service (USFS) – Monongahela National Forest (MNF) and George Washington National Forest (GWNF)

DATE:

July 7, 2015

LOCATION:

DNR Office – Elkins, WV

ATTENDEES AND THEIR AFFILIATION:

Jennifer Adams –USFS Project Coordinator
Karen Overcash, USFS GWNF, Forest Environmental Coordinator
Kent Karriker – USFS MNF, Ecosystems Group Leader
Barb Sargent – WVDNR – Environmental Resources Specialist
Craig Stihler – WVDNR – Endangered Species Coordinator
Cliff Brown – WVDNR - Environmental Resources Specialist
Stephanie Connolly – USFS MNF Forest Soil Scientist
Adrienne Nottingham – USFS MNF Soils Intern
W.J. Cober – USFS MNF Forest Recreation Manager
Gavin Hale – USFS MNF Heritage Program
Timothy Tolly – USFS MNF Hydrologist
Jacob D'Angelo – USFS MNF Forest Engineer
Mike Owen – USFS MNF Forest Aquatic Biologist
Cathy Johnson – USFS MNF Wildlife Biologist
Whitney Bailey – USFS MNF Forest Ecologist
Liz Stout – West Virginia USFWS
Ben Hardesty – Oil and Gas Consultant, Dominion
Rick Casteel – I3 Engineering, Dominion
Bob Orndoff – Public Affairs, Dominion
Bill Scarpinato - Dominion
Spencer Trichell – Natural Resource Group, LLC (NRG)
Sara Thronson – NRG

PREPARED BY:

Sara Thronson - NRG

MEETING MINUTES:

Bill Scarpinato provided a project update and Sara Thronson provided an update on the species surveys that are currently ongoing in the Monongahela National Forest including the Northern goshawk, Cheat Mountain salamander, and bats.

Stephanie Connolly stated that soil surveys that were requested have not been completed at this time. She requested that the project use a local soil scientist that knows that challenges of the Monongahela National Forest and that the Forest Service staff be allowed to vet the soil scientist. Bill Scarpinato explained that Dominion is finalizing the selection of a firm to complete these surveys now. Stephanie asked when surveys will take place and if the results would be submitted after the filing with FERC. She expressed concern that there is not enough specific soils information in Resource Report Seven at this time. She requested that surveys begin as soon as possible and should not extend beyond October 1. The NRCS is currently completing soils surveys inside the Monongahela National Forest and the soil scientist contracted by ACP would have an opportunity to coordinate with NRCS as part of those surveys. Stephanie stated that the Forest Service has a carbon map that she could provide. She also added that there are significant climatic differences between the two forests.

Jennifer Adams asked about the status of the Cheat Mountain salamander surveys. Bill responded that the project would share survey results in the near future. Kent Karriker stated that the Forest needs to have all of the information being collected in the field so that they can work with FERC on the DEIS and that a lack of information may trigger information requests which could delay the project schedule.

Bill asked about the schedule for review of the Special Use Permit application to study the MNF 5 route alternative and stated that ACP would like to get started on surveys, especially bats and others that have a narrow survey window. Kent said that they are aware of the August 15 deadline for bat surveys and are working on the approval to access MNF5 where the route crosses the Monongahela National Forest so that bat surveys can be completed. Kent asked about the status of addressing the Forest Service aquatic species. Sara Thronson indicated that review of the Forest Service species is ongoing, however many of the species will be addressed in the analysis but will not necessarily have field surveys completed.

Gavin Hale stated that he has reviewed the Cultural Resource Reports and that 90-95% of the cultural sites found during field surveys are being recommended as not eligible. He did not think that this would be acceptable within the Monongahela National Forest. Spencer Trichell explained that field surveys are ongoing and that as the field crews locate sites that are possibly eligible cultural sites the project routes to avoid these locations, which leaves primarily ineligible sites along the route. The routing away from potentially eligible sites skews this percentage higher.

Cliff Brown and Craig Stihler discussed the MNF5 Alternative as it related to caves. They believe there maybe state owned caves located on MNF5. They have received letters from concerned citizens about the MNF5 Alternative and the proximity to known cave locations. They suggested that the project contact the West Virginia Cave Board for assistance in locating caves and they would assist the project with finding a contact at the Cave Board. Cliff and Craig requested shapefiles of the Alternative routes so that they can review them.

Jennifer Adams stated that the Forest Service has received over 9000 public comments regarding the Project on the George Washington and that the project is receiving a lot of attention. She stated the Forest Service does not have enough information about the potential impacts from the project to make a decision therefore the Forest Service needs to focus discussions on avoidance and minimization and should not talk about mitigation at this time. Spencer asked Jennifer if other means of mitigation such as conservation measures and minimization was appropriate to discuss and Jennifer confirmed that it was as long as the measures were protective and conservation measures to avoidance and minimize impacts.

Bill Scarpinato provided a brief discussion of what those individuals participating in the aerial reconnaissance will be looking for. The fly over will focus on looking at steep slopes and access.

It was agreed that August 6 or 7 would be targeted for the next meeting.

ACTION ITEMS

ACTION REQUIRED:

Provide species survey results
Provide shapefiles of the MNF5 alternative

BY WHOM:

Dominion/NRG
NRG

Attachments:

Sign-in sheet
Agenda

cc: Project Files

APPENDIX 4

Notes from the Meeting between Forest Service and ACP on June 30, 2015

ATLANTIC COAST PIPELINE

PROJECT MEETING MINUTES



MEETING WITH (COMPANY/AGENCY):

U.S. Forest Service (USFS) – Monongahela National Forest (MNF) and George Washington National Forest (GWNF)

DATE:

June 30 2015

LOCATION:

Dominion Office – Staunton, VA

ATTENDEES AND THEIR AFFILIATION:

Jennifer Adams – USFS - GWNF, USFS Project Coordinator
Jobeth Brown – USFS - GWNF, Public Affairs Officer
Karen Overcash, USFS George Washington National Forest
Kent Karriker – USFS - MNF, Biology
Russ MacFarlane – USFS - GWNF, Silviculturist
Mike Madden – USFS - GWNF, Archaeologist
Fred Huber, USFS George Washington National Forest
Daniel Wright, USFS – GWNF, Glenwood Pedlar Ranger District
Lauren Stull, USFS - GWNF, Glenwood Pedlar Ranger District
Russ MacFarlane, USFS - GWNF
Tom Ledbetter, USFS - GWNF, North River Ranger District
Sandy Williams – Dominion
Bill Scarpinato - Dominion
Brian Wilson – Dominion
Shane Prescott - Dominion
John Cassidy – Natural Resource Group, LLC (NRG)
Doug Lake – NRG
Sara Thronson – NRG

PREPARED BY:

Sara Thronson - NRG

MEETING MINUTES:

The meeting began with introductions and Bill Scarpinato continued with a safety contact.

Sara Thronson provided an update on the status of northern goshawk surveys that have been completed as well as other planned surveys such as Allegheny woodrat and timber rattlesnake that are planned in the Monongahela National Forest. The surveys for Cow Knob salamanders in the George Washington National Forest (GWNF) lead by Dr. Billy Flint of James Madison University are ongoing. Cow Knob salamanders have been found in the survey area of Shenandoah Mountain. Fred Huber stated he participated in one night of surveys with Billy Flint and that Cow Knob salamanders were being found in areas with red oak overstory and a thick mountain laurel understory. It was previously unknown that the species would occur in this vegetation type. Fred stated that he would like to convene a Conservation Team for the Cow Knob salamanders. This team would likely be a combination of Forest Service staff, U.S. Fish and Wildlife Service staff, as well as applicable state agency staff and other species experts in academia. Billy Flint should plan to present the findings of field surveys to this Conservation Team.

Jennifer Adams commented that the Cow Knob Salamander Conservation Agreement will likely have an effect on the pipeline route through salamander habitat. Karen Overcash agreed. This Conservation Agreement precludes the listing of the Cow Knob salamander so the U.S. Fish

and Wildlife Service will need to be involved. Fred Huber requested to be provided with the survey data and ACP agreed to provide this data.

Jennifer Adams and Fred Huber discussed possible measures to avoid Cow Knob salamander habitat on the ridge including alternative routes, directional bore as well as horizontal directional drill. Fred Huber suggested a horizontal directional drill (HDD) of the highest potential areas such as the ridge tops to prevent disruption of wildlife corridors. Bill Scarpinato stated that engineers would have to evaluate the potential for an HDD. There was further discussion about the feasibility of an HDD and the engineering related challenges such as pull back areas, elevation of entrance and exits, drilling mud, frac outs, etc. During the discussion of Cow Knob salamander, Dominion asked the Forest Service's position on impacts to sensitive species. Kent Karriker stated that FS Manual direction emphasizes avoidance and minimization of impacts. Kent Karriker suggested that the MNF5 route offers a good starting point for investigating a more southerly route that avoids Cow Knob salamander and cultural resource issues on Shenandoah Mountain. Bill Scarpinato and Doug Lake said that they had already ruled out such a route through their consideration of the "conceptual southern route," which runs into problems with incompatible management areas on the GW. However, Kent Karriker, Fred Huber, and Jennifer Adams said that it appeared that those areas could be avoided by varying the route.

Mike Madden shared concerns with the group about the pipeline right of way providing a conduit for ATV use which could ultimately lead to looting of archeological sites. Mike requested that the Project address what measures could be taken to prevent looting and access to archeological sites. Jennifer Adams also expressed concern about rare species collection as well as dumping. The group discussed methods to prevent ATV use, curtail access, looting, prevent disruption of wildlife travel corridors.

Sara Thronson requested discussion regarding the need for Biological Evaluation (BE) for the crossing of the Forests. Sara asked if one BE should be prepared to cover effects in both the MNF and GWJNF or if separate BEs would be needed. Jennifer responded that the MNF and GWJNF are in different regions and stated an MOU exists between the MNF and GWJNF for the project. Jennifer requested to delay further discussion related to the BE until she confirmed with regional office(s) whether one BE would be appropriate.

Kent Karriker made a request for Dominion to analyze effects of the various system and co-location alternatives vs. the proposed routes. Kent specifically requested that they compare environmental parameters of interest, rather than just miles and acreage footprint.

Doug Lake displayed a map of the existing railroads in the vicinity of the ACP and explained that these railroads run in a Northeast to Southwest direction and do not run the direction that the pipeline needs to go. ACP also reviewed the designated utility corridors and in the Monongahela there is a utility transmission corridor that was reviewed. Doug explained that transmission lines can span cliffs and be constructed in areas that a pipeline can't. In the Monongahela the preferred route follows a previously disturbed mine bench. Kent Karriker commented that this disturbed area is now an ecosystem restoration area. Jennifer Adams asked for the document that was prepared to compare the route alternatives for avoidance of the MNF5.

Bill Scarpinato provided a map of the Appalachian Trail (AT) and Blue Ridge Parkway crossing. He explained that this will be a 4,700 foot horizontal direction drill (HDD). Lauren Stull asked if the crossing of the AT is being selected because it takes an Act of Congress to cross the AT in other locations. ACP agreed that landownership is the main factor in selecting location of the AT crossing. Fred Huber asked if a HDD was being considered to avoid land ownership issues at the AT and that the ACP further examine an HDD to avoid Shenandoah Mountain and the Cow Knob salamander.

Bill Scarpinato asked Russ MacFarlane and Tom Ledbetter to discuss the concerns of the GWNF related to fire and the proposed route. They explained their concerns are about understanding how the presence of a pipeline could affect the forests' ability to manage both wild and prescribed fire. The use of prescribed fire is an important management tool to the GWNF and they need to understand what the potential for the route to affect that management method during construction as well as during operation such as if it will block or limit the ability to use this technique. Peter Fisher is the contact for fire at the Monongahela and Tom Ledbetter will take the lead for the GWNF. It was agreed that further discussion would need to take place on this topic.

Mike Madden stated that he had reviewed the Cultural Resource Report and that 90-95% of the cultural sites that are reported on are recommended to be ineligible. He understood that the results will be submitted to the State Historic Preservation Office (SHPO) and that there is a review process in place. Lake commented that while this information was true, the areas surveyed and assessed and submitted to the SHPO to date have been well-utilized and farmed/disturbed areas, unlike the relatively low level of disturbance found in the National Forest lands, and that this is likely why so many sites that were reported were determined to be ineligible for listing.

John Cassady requested discussion about the need for a Land and Resource Management Plan (LRMP) consistency review. The group discussed that this review needs to take place in order to assist the Forest Service in a determining if project-specific amendments to either of the LRMPs are necessary to accommodate the Project. Kent Karriker said the Forests need to discuss this topic more internally before they can discuss it with ACP. Karen Overcash requested examples of consistency review documents so that she could better understand what those documents entail.

John Cassady requested discussion about a Plan of Development (POD)/Construction Operation and Maintenance (COM) Plan. Jennifer Adams stated that it would be inappropriate for the Forests to discuss this topic without the Bureau of Land Management (BLM) and the FWS present. The Forest will rely on the BLM to handle the administrative piece. John Cassady suggested that once the necessary interagency coordination has moved forward, ACP could submit an outline of the POD or COM Plan, as a way to develop a mutual understanding as to what will be covered therein.

Doug Lake requested a recommendation for the average tree height that should be used during the viewshed analysis. The GW replied that the model should be run as if there are no trees. Daniel Wright stated Sherando Lake is a location where the entrance to the picnic area is a long driveway and the whole area would need to be assessed for views in addition to the picnic area.

Russ MacFarlane stated the Whiteway timber sale is a timber sale that is already in process. There will be coordination needed to address this timber sale and there should not be significant concerns.

Doug Lake asked that for the currently proposed route, where it crosses the previously disturbed Lambert Run Coal Mine and utilizes the existing mine bench, what would be a reasonable approach to developing and discussing mitigation as part of ACP's proposal to use this area. Jennifer replied that the Forests are focused on avoidance and minimization. Lake suggested that mitigation could include minimization possibilities, such as drilling sensitive areas or reducing the width of the construction right-of-way. Jennifer indicated that it was inappropriate to discuss mitigation at this time in the review process, until a decision to use or not use this area was made. Jennifer also requested that Carol Grundman (BLM) be on the phone and part of this discussion.

Jennifer Adams asked when soil surveys would happen. Sandy Williams stated that at this time soil surveys are planned in the fall after the FERC application is submitted and would be filed as supplemental information. Jennifer and Kent expressed concern over the fact that this information would not be available to inform the DEIS.

Doug Lake asked if, after review of the draft Resource Reports submitted in May to the FERC, the Forest had any comments or identified any need for additional information to be addressed in the reports. Jennifer Adams said that the Forests are working on comments to the Resource Reports and will submit them to FERC so that they are on the public record.

It was agreed that early August would be considered for the next meeting.

ACTION ITEMS	
ACTION REQUIRED:	BY WHOM:
Provide species survey results	Dominion/NRG
Convene Cow Knob salamander Conservation Team	Fred Huber
Provide examples of LRMP consistency review	NRG

Attachments:

Sign-in sheet
Agenda

cc: Project Files

APPENDIX 5

**Notes from the Meeting between Forest Service and ACP on October 2, 2015
&
Forest Service's Review of ACP's Proposed Methods for Soils Surveys**

ATLANTIC COAST PIPELINE PROJECT MEETING MINUTES



MEETING WITH (COMPANY/AGENCY):

U.S. Forest Service (USFS) – Monongahela National Forest (MNF) and George Washington National Forest (GWNF)

DATE:

October 2, 2015

LOCATION:

USFS Office – Harrisonburg, VA

ATTENDEES AND THEIR AFFILIATION:

Jennifer Adams – USFS - GWNF, Project Coordinator
Tom Bailey – USFS – GWNF, Soil Scientist
Stephanie Connolly – USFS – MNF, Soil Scientist
Kent Karriker – USFS - MNF, Biology
Bill Scarpinato – Dominion Environmental
Colin Olness – Dominion Engineering
Steve Holden – Natural Resource Group, LLC (NRG)
Spencer Trichell – NRG

PREPARED BY:

Spencer Trichell - NRG

MEETING MINUTES:

The meeting began with an introduction of all participants and their duties.

Stephanie Connolly provided her review status by stating that the expectations by the USFS set in December 2014 in the initial Survey Permit and discussed in February of 2015 have not been met. She asked that a certified professional soil scientist (she provided Andrea Thorton with some names – documented in an email in Spring 2015) who had worked in the Central Appalachian region be utilized for the soil survey but did not receive confirmation that that was the case. Stephanie followed up with NRG in April and then again asked Dominion at a meeting in July about the status of the soil survey. Again she was told erroneous information that the Forest would have the opportunity to review submitted proposals to review the qualifications. The following week in late July, a follow up communication occurred from GEOSYNTEC in a telephone conversation with Colin Olness. Mr. Olness said he would provide the name of the contractor who had already been selected in a week. The follow up did not occur as was anticipated. The lack of communication resulted in a need to have this meeting to discuss the GEOSYNTEC proposal and future needs for communication. She also stated that the Order 1 soil survey, as proposed by ACP/NRG/ GEOSYNTEC (as displayed in the slide show proposal) is not feasible or adequate for the terrain or to determine the information and data requested for the effects analysis. She asked that this meeting focus on who was chosen to conduct the soil survey, why an Order 1 soil survey is needed, and deficiencies in the proposed plan.

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Bill Scarpinato explained that Dominion has a procurement process that has to be followed when selecting any sub consultant or contractor, which was the reason Stephanie's recommended surveyors were not chosen. Kent Karriker stated that the USFS does not intend to micro-manage Dominion's procurement process. However, the USFS does place importance on local expertise.

Comment [SJC1]: Note – NRG requested a list of suitable contractors from the Forest. Documented in e-mails from Spring 2015.

Stephanie stated that the soils are so different (diverse) from Huttonsville, WV to Staunton, VA that only a professional soil scientist with experience within the region, would be an acceptable contractor to adequately prepare an Order 1 level, soil survey. Kent explained that soil variation is one of their major concerns. In addition to variation in soil characteristics, the topography is

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extreme, thus necessitating data collection on a fine scale to plan for stability problems and soil chemistry differences. Kent also stated that the ACP proposed Order 1 soil survey plan does not consider the physical movement of the soil. Colin Olness stated the geohazard assessment will address the physical movement of the soil and will be included in a later phase. Jennifer asked that a copy of the geohazard plan be provided to the USFS geologists. Bill stated that the plan is attached to the resource reports, which have been filed with the FERC.

Stephanie requested that soil samples go to the C horizon, or bedrock, whichever is encountered first. Also she discussed the scale of what an Order 1 level soil survey entails. The smallest polygon of mapping is typically 2.4 acres (1 hectare). Given the size of the review area, this would equate to 438 soil pits/observations (at least one every 350') to ensure that the level of detail meets Order 1 scale. In the landscape on the MNF, anything less could result in errors due to intermingling contacts in local geology. Colin committed to this level of survey coverage. In addition to more observations, Tom requested that detailed observations be recorded between the sample sites to capture fine-scale differences related to geologic contacts. Stephanie also asked that the appropriate soil sampling and digging tools be used to conduct the survey. This included augers, Montana sharper shooters, digging spades and digging bars. Tom asked that the survey identify the erodibility of soil surfaces by conducting site specific analyses, not relying on SSURGO data. He also asked for clarification on how erodible areas would be identified and stated that the RUSLE2 method was intended for agricultural, not forested areas, therefore would not be acceptable.

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The USFS prepared a document reviewing the ACP/IRG/GEOSYNTEC proposal. The comments in that document provide a finer detail than the conversation captured in the above notes. Please attach this document to these notes for explanation and further detail – S. Connolly, Monongahela National Forest, Forest Soil Scientist.

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Tom stated that the soils maps used for desktop studies are not reliable so field verification is needed. This is due to the style and methods of soil survey used on forested lands prior to the 1990's where emphasis was placed on agricultural lands. He also indicated that the USFS would like to know the methods for grabbing soil chemistry samples. Stephanie stated that although the carbon stock study is in publication and is not ready for release, the shapefiles could be shared. In addition, she asked that the carbon stocks indicated in the shapefiles be verified.

Kent stated that the soil chemistry is needed for each soil layer so that restoration could be accomplished after construction without affecting the soil pH. He also stated that standard soil restoration would not work or be good for the environment. Tom explained that some shales in this area can be acidic and the top soils are thin with very thin organic horizon. He also stated that the soils in this area are droughty and the water holding capacity is low. Therefore, mulching and soils amendments are crucial to successful restoration efforts and soil nutrient needs are part of the information needed to achieve suitable vegetative cover. Topsoil segregation does not alleviate the need for mulching and site specific fertilizer and lime applications.

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Soil chemistry is needed for several reasons and should be used in the effects analysis to determine risk and to provide for design and mitigation for the pipeline project implementation.

- 1) Soils are highly variable in pH and nutrient status across the corridor from west to east. Soil chemistry is highly dependent on several factors: geology, landscape position, vegetative cover, and elevation.
- 2) Soil pH will dictate the type of revegetation plans needed to grow suitable native plants and to protect habitats for acidic flora and fauna dependents including red spruce and salamanders. This will be an important factor in determining any liming requirements and selection of flora species for restoration. Standard reclamation techniques being used in the industry and in western WV would not be suitable in these soil types or necessarily successful. Soil chemistry information will be need to help make informed adjustments to those standard plans.
- 3) Soil pH will also be needed to determine the risk for corrosivity to the pipeline itself and any concrete support structures that may be used. Current forest data shows that soil pH's can be as low as 2.8 in upper soil horizons.

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Stephanie mentioned that the Mauch Chunk geology on Cheat Mountain is highly susceptible to slumping and sliding due to the presence shrink-swell clays and their mineralogy. There is evidence of this on the landscape from old debris flows. The soil material can be very deep and can contain multiple layers of perched water tables or lenses, which makes it unstable. Core boring may be needed to assess landslide risk adequately.

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Stephanie stated that she would prefer that Dominion send soil samples to the University of Maine, but was agreeable to the use of the Virginia Tech University soil testing laboratory. However, it would be important to tell VA Tech where the samples were taken and that they are forest soils, not agricultural soils so that

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Kent stated that this soils information is critical information for their decision and that draft environmental impact statement input from the USFS isn't going to be complete without the level of detail they are requesting. Colin stated that the crews are in the field now collecting this data and should be finished with the field component by October 16, 2015. It was also noted that the Forest was not notified that the company's soil survey crews were working on the Forest and protocol for such activities and communication had been broken. Stephanie requested to see the resumes of the soil survey crew by the following week. Colin said this was not possible. Colin committed to providing resumes for the personnel conducting the surveys by October 16, 2015. Stephanie re-iterated the need for the survey personnel to be professional soil scientists with regional experience in the Central Appalachian Mountains.

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Tom stated their list of expected deliverables as: field maps with sample locations and critical erodible areas identified, field notes, photographs of holes and features, and records of observation between formal observation points. Stephanie clarified that Dominion should follow NRCS' Order 1 soil survey and provide everything that the method requires.

Stephanie stated that there are potential gob piles buried along the historic mine tailings areas which are acidic and may contain heavy metals. She expressed her concern that trenching and grading may bring these to the surface. She asked that Dominion place a qualified individual onsite during excavation to assess their presence. Also she stated that there be a qualified individual on site to determine the separation of the surface soil horizons from the sub soil.

Jennifer stated that notification prior to survey should be made to her, Kent, Stephanie, and Jack Tribble in the MNF and her, Tom, and Elwood Burge in the GWNF.

ACTION ITEMS

ACTION REQUIRED:

Shapefile of Carbon Stocks on MNF.

Resumes of personnel conducting soil
surveys

BY WHOM:

Stephanie Connolly
Colin Olness

Attachments:

Sign-in sheet

USFS Review Notes

cc: Project Files

DRAFT

USFS Review of Proposed Methods by Geosyntec Consultants for ACP Soil Survey

September 24, 2015

Atlantic Coast Pipeline (ACP) Soil Sampling Project: Monongahela and George Washington National Forests

Submitted by: Colin Olness, PE

Contractor

Atlantic Coast Pipeline - Construction

Review by:

Stephanie J. Connolly, Forest Soil Scientist, Monongahela National Forest

Thomas W. Bailey, Forest Soil Scientist, George Washington and Jefferson National Forests

This review is based on the input provided by the Monongahela National Forest Special Use Permit (Reference # for Surveys of the Preferred Route), Scoping Comments to FERC, April 27, 2015 and methods provided by the USDA- Natural Resource Conservation Service: *The surveys needed for the soil resource will require a site specific order 1 level soil survey within the corridor. An Order 1 Soil Survey is defined by the USDA NRCS in the referenced document.*

http://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2_054252

Discrepancies and Clarifications of Methods:

- Use of equipment and tool to complete soil sampling and transects:
Please be prepared that these probes do not work within this landscape. The crew will need Dutch augers or open faced augers to grind around rock, heavy duty sharper shooters, and possibly picks. These are all tools our crews carry when completing transects for site specific field work.



Typical soil profiles that can found across the top of Cheat Mountain underlain by the Pottsville Group (A primary sandstone geology with conglomerate boulders and stones across the surface.)



This soil is typical of those series mapped in lower elevations of the Upper Greenbrier Watershed and below the Mauch and Greenbrier Limestone on the face of Cheat Mountain in the Chemung/Hampshire Formations. Mapped with 35% rock fragments in the control section. Notice the Montana Sharpshooter in the foreground of the photo on the right.

- Sample size:

The soil probe used in the sampling method demonstrated in presentation is used to sample agricultural soils. Soil chemistry samples for forest soil analysis are obtained by opening a small pit to bed rock and soil samples are pulled by hand from designated horizons, bagged, and labeled.

- Sample depth. ACP proposing to sample to 2 feet:

Many of the major soil series in the ROW have diagnostic properties and characteristics like water tables, humic horizons, fragipans, argillic horizons (clay bulges of significance due to mineralogy), and other features that are located at a depth of more than 24 inches. Excavation to bed rock or 50" would be required in order to capture the description of the entire profile since it proposed to disturb and remove the entire solum from the pipeline corridor. It is critical to have this data in assessing interpretation from large scale disturbance. This may mean that they need to go to 4 feet or more given the desire to excavate all the way to bedrock.

- Primary Issues Addressed in Chapter 7 Resource Report for Soils:

This presentation focuses on topsoil segregation and sampling to estimate erosion potential and erosion control ammdendments needed after final grading. Although these issues are critical to successful pipeline implementation and control of erosion and sedimentation; larger issues driving this project are centered on slope and slope stability related to geologic and soil mineralogy characteristics. There is

little information outlined about methods to assess these issues. The issues are mentioned throughout the presentation but are not mentioned in the deliverables in a way that is clear. The MNF Forest Plan has specific requirements for soil disturbance occurring on steep slopes and slopes prone to slippage.

- The selection of Virginia Tech University as a testing lab would be satisfactory to the both National Forests; however, to ensure proper results for interpretation and management - forest soils analyses would need to be run for soil chemistry protocols and agricultural soils would need to be analyzed with those preferred protocols and methods.

- Proposed transect distance between points is inadequate for an Order 1 Level Soil Survey: The scale range and minimum size of a polygon or soil map unit is defined by NRCS in the methods section for creating a soil survey. An order 1 level soil survey map unit smallest unit is 1 hectare or 2.5 acres. This is usually defined by a 1:12,000 scale or less soil survey. The soil survey used in the Chapter 7 Resource Report was mapped at a 1:24,000 scale where the smallest polygon or map unit size could be on average 5 acres in size. The proposed transect distance by ACP results in the smallest size of the polygon being 8.3 acres.

$300\text{ft} \times 1200\text{ft} = 360,000\text{ft}^2 = 8.3 \text{ acres}$

29 miles = 153,120ft

This equates to approximately 128 observations at a minimum.

The Forest requires an observation made every 350 ft. A hole would need to be dug at every observation that would indicate a new soil type is present. Periodic holes would need to be dug to confirm that a certain soil type was repetitive on the landscape. A statistical analysis can be done to determine this using digital soil mapping.

$300\text{ft} \times 350\text{ft} = 105,000\text{ft}^2 = 2.4 \text{ acres} = \sim 1 \text{ hectare}$.

Using the same length surveyed above this equates to 438 observations at a minimum.

One major reason why there is a need to intensively look at each point within the transect of 350 ft. is that the transect runs perpendicular to the slope not parallel; and if one considers landforms and elevation gain and then loss, the changes on the ground are going to occur quickly especially in the Appalachian Mountains and over to the Shenandoah Valley. Geologic contacts can occur within 10's of feet on the landscape. I know of plenty of examples where this happens on Cheat Mountain. However, a good soil scientist with field experience and mapping experience knows this and can easily work through a transect identifying like soil landscapes and subtle changes and knowing when a hole needs to go into the ground to verify that change. However, if one sees a change within the 350 ft. distance...like rock outcrops or a hydric soil inclusion...then one should definitely identify that and map it out because that would have large implications for management recommendations, given the type and scale of the disturbance proposed.

- Lack of credentials displayed for the Consulting Soil Survey Crew

The Monongahela National Forest required that the Soil Survey be conducted by a professional certified soil scientist with experience mapping and/or consulting in the Central Appalachian Mountains. In addition, in a meeting with the USFS on July 17, 2015, Mr. Orandorf told the USFS they would be