

I-5 Corridor Reinforcement Project

Final Environmental Impact Statement

Volume 3D: Comments and Responses (Communications 14702–14746)
DOE/EIS – 0436

Bonneville Power Administration

Cooperating Agencies:

**U.S. Army Corps of Engineers, Oregon Energy Facility Siting Council,
Washington Energy Facility Site Evaluation Council, Cowlitz and Clark Counties, Washington**

February 2016

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Comments and Responses

Volume 3D

Communication Log Numbers 14702 - 14746

Each comment form, email, letter or other type of correspondence (collectively referred to as communications) was given an identifying log number when it was received (e.g., 14100). Breaks in the number sequence are a result of communications logged during the comment period that were not comments on the Draft EIS. In some cases, duplicate communications (such as petitions and form letters) were later combined and assigned the same log number. Each communication is divided by subject or issue into individual comments. For example, 14444-2 is comment number 2 of communication 14444. BPA received 662 communications on the Draft EIS and 2,859 comments were identified in these communications.

All comments received on the Draft EIS and BPA's responses to these comments are provided in their entirety in Volume 3 (Volume 3A through 3H). Each page of comments is followed by a page of BPA responses to the comments. Due to the number of comments received, Volume 3 has been divided into eight parts for the purposes of printing and managing electronic file sizes (Volume 3A through 3H). The range of log numbers and page numbers found in each volume is included in Table 1 - Volume Contents for reference.

How to Review Comments and Responses

Communications are ordered consecutively by log number in the report. Please refer to Table 2 in the Introduction of Volume 3 for a list of all communications submitted by each commenter and the page number where the communication can be found in Volume 3A through 3H. If BPA's response to a comment refers back to an earlier response, use Table 1 to find the referenced log number. An online comment response search tool is also available at <http://www.bpa.gov/Projects/Projects/I-5/Pages/Search-Comments.aspx>.

Table 1 - Volume Contents

Log Numbers	Volume	Pages
14093 – 14379	3A	1 - 402
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14702

NORMA J WATSON

03/24/2013

Bonneville Power Administration I-5 Corridor Reinforcement Project Comments

To Whom It May Concern:

- BPA states that choosing the Central Alternative meets their goal of operating a reliable transmission system
- 14702-1 We have yet to hear how creating a new line in this pristine Dole Valley area proves you are capable of making it reliable. You will be placing towers through 79 miles of mountains, prairies, forests, wetlands, rivers and reservoirs. Your current line is along a visible, highly used thoroughfare while the proposed line will traverse areas not visible to activities by terrorists or even vandals. Please tell us how this compares to the existing reliable line along I-5.
- BPA states that choosing the Central Alternative avoids some of the most environmentally sensitive areas along the route farthest to the east
- 14702-2 Explaining where and when you plan to invade and install your lines does nothing to show us you really are aware of the animal and plant life impact. No one has been able to say exactly how you will prevent the loss of the ecosystems in the old forest and wetlands that make up the Dole Valley area where Rock Creek meets the East Fork of the Lewis River. Exactly how will you protect the eagles from the effects of
- 14702-3 the lines? Exactly how will you prevent the Torrent salamanders from effects of trucks and crews
- 14702-4 building the lines? Exactly how will you protect the corydalis aquae-gelidae growing along Rock Creek and the East Fork of the Lewis River from dying away after being trampled upon during construction and maintenance? Will the use of herbicides along and under your lines be prevented from poisoning
- 14702-5 wildlife, contaminating the rivers, streams and wetlands near your right of way and how will you insure that?
- BPA states that choosing the Central Alternative meets their goal to responsibly manage costs for regional ratepayers
- 14702-6 The estimated cost is \$459 million, a little more than the mid range of the four options, which span from \$385 million to \$489 million. During this economy, isn't the responsible decision to go with the lowest cost? Don't government projects go to the lowest bid? Why is the right of way used by the closed
- 14702-7 Trojan plant not being considered? It is already owned by a power company. Is it just easier to condemn private property rather than pay to purchase the rights for their existing right of way? Or is it that they have as many lawyers as you do and it would be too hard to fight them?
- 327 homes are located within 500 feet of the preferred alternative, compared to more than 3,000 along an existing BPA transmission line that runs parallel to Interstate 5
- 14702-8 The 3000 homes in the existing route purchased knowing the BPA was present on land adjacent to theirs. The 327 homes in the Central Alternative bought and live in the area because there was no

- 14702-1 From a transmission planning perspective, using the same corridor or right-of-way is evaluated according to the appropriate electrical performance standards. Before deciding to build a new line along a common corridor shared by other transmission lines, BPA considers the risk of any planning or operational problems that could occur for the loss of adjacent lines. If the loss of multiple lines in the same corridor has adverse consequences, building a new line in the same corridor may not be a good alternative. Therefore, building the new line on a separate right-of-way benefits reliability, because this would avoid a situation in which multiple lines could be lost simultaneously. See also the response to Comment 14460-1.
- 14702-2 Chapters 16 through 19 describe the existing plant and animal species in the project area and potential impacts to animal and plant life from the proposed project. Each of these chapters and Table 3-10 describe mitigation measures that could be used to avoid or mitigate impacts. Environmental resource surveys along the Preferred Alternative were conducted between the Draft and Final EIS.
- 14702-3 Please see the response to Comment 14480-3.
- 14702-4 Specific locations of rare and sensitive plant species observed during field surveys were recorded. Such species would be protected by avoiding and minimizing disturbance to these populations during project design, construction, and maintenance activities. Section 17.2.8, Recommended Mitigation Measures, in Chapter 17, Wildlife, lists mitigation measures that would be implemented to protect special-status plant populations and associated habitats.
- 14702-5 Please see the response to Comment 14160-1.
- 14702-6 BPA has identified the Preferred Alternative after considering many issues, one of which is cost. Additionally BPA has considered impacts to people, the environment, engineering issues, and other factors.
- 14702-7 The lines are owned and operated by PGE and are presently in use by that utility. There is no capacity available for BPA use on those lines (see Section 4.7.2.6, Trojan Nuclear Plant Facilities) and there is no room in the existing easement to add another transmission line.
- 14702-8 Please see the responses to Comments 14328-5 and 14623-6.

14702-8 | intention of living around or near BPA lines. Please explain why you see these two groups of landowners as the same.

The Central Alternative preferred route is outlined in a 2,000-page environmental impact study covering 79 miles

14702-9 | BPA trivializes the importance of our relatively small property by insisting we comment on properties miles away and those property owners comment on our situation with the same lack of local knowledge. Our grandparents and parents purchased our property in the early 1950's. This was land regenerating and repairing from the Yacolt Burn. It is old forest with high quality native habitats as you are well aware. It takes an ecologist years to study and record the life in our Dole Valley. If the present day landowner has questions or concerns about the plants or animals on their land, they must seek professional help. Yet the BPA hands over a 2000-page document covering 79 miles of varied terrain for us to examine and make educated comments upon. Would you please comment on how this process is to in any way fair to all individual landowners along this route?

Norma Watson

Mailing address: [address]

Affected property address: [address]

[email]

14702-9 Despite the large size of the EIS, BPA has done its best to create a document that can be used by our varied project stakeholders (including landowners) to understand the range of alternatives we are considering, and the types and locations of impacts caused by the alternatives. We have also sought the help of resource professionals within the private sector and federal, state, and local agencies, and Tribes, to understand and evaluate project impacts.

14703

BRUCE J WATSON

03/24/2013

Bonneville Power Administration I-5 Corridor Reinforcement Project Comments

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- BPA states that choosing the Central Alternative meets their goal of operating a reliable transmission system
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- 14703-1 Please see the response to Comment 14702-1.
- 14703-2 Please see the response to Comment 14702-2.
- 14703-3 Please see the response to Comment 14480-3.
- 14703-4 Please see the response to Comment 14702-4.
- 14703-5 Please see the response to Comment 14160-1.
- 14703-6 Please see the response to Comment 14702-6.
- 14703-7 Please see the response to Comment 14702-7.
- 14703-8 Please see the responses to Comments 14328-5 and 14623-6.

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Bruce Watson

Mailing address:[address]

Affected property address:[address]

[email]

14703-9 Please see the response to Comment 14702-9.

14704

BRIAN AGREN

03/22/2013

March 21 2013

Mark Korsness

Project Manager

I-5 Corridor Reinforcement Project

P.O. Box 9250

Portland OR 97207

Questions and comments to the BPA on the I-5 corridor Reinforcement Project and the Central Option

1 Preferred Alternative.

DEIS s.1.2 page s-2 Talks about the "Projects Primary Purpose" and gives four objectives.

1. Maintain system reliability and performance.

2. Help BPA meet its statutory and contractual obligations.

14704-1 3. Use ratepayers funds responsibly and efficiently.

4. Minimize impacts to the natural and human environment.

In reading through tables 4-9 through 4-11 in the DEIS nearly all of the rout segments are compared to the West Alternative. The reason for that is the West Alternative is the clear choice to meet the four criteria set forth in the DEIS as the "Projects Primary Purpose". I went into detail on this issue in a meeting at Castle Rock Elementary on February 4 2013, you can consult the notes from that meeting for a more detailed idea of why I assert that the BPA has failed on all four points.

14704-2 The choice of BPA Central Option 1 will stifle the growth of the town of Castle Rock, potentially shut down rural business and displace several residence or in the least devalue their homes and property.

This wisdom begs the question. If the BPA is using the monies it received (3.25 Billion) from the American Recovery and Reinvestment Act 2009 to finance the construction of this project then isn't this route going against the purpose and intention of said Act?

14704-3 I have heard said that the need for this line out weighs or somehow can justify the placement of this line so close to populated areas and even the city of Castle Rocks' urban growth boundary. I can see the BPAs logic behind building this line. I even upgrade my homes power system when I need to, however I don't build a new house when I can remodel. Why cant the BPA upgrade their current lines that run in the same direction?

14704-4 I have looked at the maps and I live within 4 miles of the existing ROW which has four lines on it.

According to the literature that the BPA provided in the DEIS chapter 2 figure 2-1, there are four lines

14704-1 Identifying a preferred alternative is a complex process. Each route has advantages and disadvantages. Some of the advantages of the Preferred Alternative (Central Alternative using Central Option 1) over the West Alternative include going by significantly fewer homes, crossing fewer wetlands, and not having two adjacent lines that serve similar loads susceptible to both going out at the same time due to a single corridor event such as a landslide.

14704-2 Please see the responses to Comments 14171-5 and 14674-1.

14704-3 The last 500-kV lines to be built in southwest Washington and northwest Oregon were constructed more than 40 years ago. In recent years, BPA has used a combination of technical solutions and aggressive conservation to maximize the use of the existing system and avoid building a major high-voltage line in the area. Rather than building new substations and new transmission lines, we have used other methods, such as operational procedures and less expensive facility upgrades and additions, to take advantage of all the available capacity in the existing lines.

However, the region is nonetheless outgrowing the existing transmission system. So, BPA has identified a need to build another major line in the area. See also Section 1.1.3, Planning for Transmission Additions in the I-5 Corridor.

14704-4 BPA studied making system upgrades to the existing 115- and 230-kV transmission lines in this area, but these upgrades would not provide the added reliability, stability and flexibility that a new 500-kV line would. See Section 4.7.3, Lower Voltage Line Upgrades. Adding additional 115- and 230-kV transmission lines and substations would add more total miles of transmission line upgrades than are being proposed with the I-5 Project.

- 14704-4 going to Longview. Two of those four lines are 500kv and two are 230kv. Why cant the 230kv lines be upgraded to 500kv? Or even one?
In Central Option 1 the BPA is proposing running 8 miles parallel to the existing ROW for the Casey road substation. Why can't the new line be run all the way to Longview this way?
When the line reaches Longview there are three options. There are two ROWs in Oregon one of which is only 115Kv. Why did the BPA not study upgrading this route? The other ROW in Oregon is a more rural route which has a 500KV line on it already. Why was this route not included as an option?
- 14704-5 The third possibility from Longview is the ROW with the 230Kv line through Washington. Why not upgrade the ROW to 500Kv with double or triple decked lines?
The excuse that I have heard coming from the BPA is if something happened to the corridor then all of the lines would be affected. Essentially you don't want all your eggs in one basket. Wise logic but dose not make any sense when applied to this situation. In this situation the new proposed line starts from a group of existing lines and ends at a group of existing lines. The BPA proposes that something may happen between these existing lines on the new corridor. If something was going to affect the new corridor why hasn't the existing corridor had any problems? These lines have been reliably working for many years. Has the BPA ever had an issue with these existing lines? Have the terrorist targeted these existing lines ever? If so no one has mentioned it ever, and the BPA did not address this issue in the DEIS. It would sand to reason that if the West Alternative was used the new 500Kv line would be as reliable as the existing ROW has been in the past.
- 14704-6
- 14704-7 I think I may know the answer. Is the reason that the BPA won't use the West Alternative or any other existing ROW because what the BPA is after is a new ROW when land prices are low and the BPA is flush with Recovery monies?
- 14704-8 If the answer to this is yes then why put all of these land owners through this agonizing long process and feed us misinformation and disinformation? Why not just come right out and say the BPA wants to buy a new ROW?
- 14704-9 The next topic I would like to discuss is the process through which Central Option 1 was developed. In October 2009 when this process started. There were two substations and 52 route segments on the original map at the start of the "scoping period". At the official end of the "scoping period" in late 2009 there was not any mention or map containing the lettered routes or additional proposed substations north of Castle Rock. The lettered routes did not show up on a map until seven months later. A full seven months after the close of the scoping process. The BPA literature explains that they listened to the people during the scoping process and developed these new routes as a result. How much thought and time could the BPA have put into researching 23 new routes and two new substation sites in seven months time? If the BPA was able to honestly research 23 new routes and two new substations in seven months then why can't a new more north eastern route in a less populated area, such as the Grey Route, be created now and studied?
- 14704-10

- 14704-5 Please see the response to Comment 14460-1.
- 14704-6 Please see the responses to Comments 14460-1 and 14702-1. Chapter 23, Intentional Destructive Acts, acknowledges that acts of sabotage, terrorism, vandalism, and theft sometimes occur at power facilities, including transmission lines and substations, and that it is difficult to predict the likelihood of, and increased risk for, terrorist or sabotage acts from building a project near, next to, or far from existing transmission system facilities.
- 14704-7 BPA considered a wide variety of issues in identifying a preferred alternative, including impacts to people, the environment, cost, and engineering criteria. Should BPA decide to construct the new line, it would use its borrowing authorities or other funding mechanisms, with repayments made with ratepayer funds as required by statute.
- 14704-8 BPA has considered alternatives on existing and new right-of-way. The Preferred Alternative requires new right-of-way, but also uses existing right-of-way for a portion of its length.
- 14704-9 In developing the original map and segments, BPA studied and became familiar with the area. After considering the public comments on our proposed routes, BPA spent several months and considerable effort studying the area further and developed a revised map. The revised map provides a broad range of reasonable alternatives to consider.
- 14704-10 Please see the response to Comment 14642-3.

- 14704-11 The next subject related to the process is the issue of public comments. I attended the “post scoping” meeting in Castle Rock. At that meeting every one was asked for comments and the BPA answered some questions. The representatives from the BPA assured us that our comment would be read, addressed and be part of the DEIS. I have not seen anything of the sort in the DEIS. The fact of the matter is the post scoping comments were not handled in any way similar to the original scoping comments. The only information I can find is on the BPA I-5 Corridor Reinforcement Project web site in the libraries section under comment summary. The comment summary is just that, a summary of the report preparers interpretation of the actual comments. How are the decision makers to make a decision when they don't have all the facts? Are there any other facts that were omitted or simply summarized and left out of the DEIS? If the comments from the scoping meetings and post scoping meetings were left out of the DEIS document just how valid and informed could the Central Option 1 decision be?
- I would like to know if the questions in this letter will be answered in the final EIS or just summarized and buried in a library on the BPA website?
- 14704-12 How dose the BPA propose to mitigate for the city of Castle Rock ?
- 14704-13 When you look at the current project map the Central Option 1 takes a turn at Castle Rock and then cuts through its urban growth boundary staying just outside the city limits. The city of Castle Rock is not a wealthy town. It is in some ways like a lot of small towns in the northwest. In the middle of a transition from a timber based economy to something else. The city has a 34% poverty rate. Castle Rock has acquired grants and raised monies to improve their town. One of which is a six million dollar investment in their sewer system. The plan was to grow Castle Rock north and recover the investment when people build middle to upper middle class homes in this area. The land that the Central Option 1 is going through near Castle Rock is premium value river front land. The type of land that would attract these types of homes. Where is the wisdom in the placement of this route? Why could the BPA not stay completely away from the town of Castle Rock? There must be some reason for the direct and purposeful placement of Central Option 1 within the urban growth boundary of Castle Rock. The BPA has explained that the route in this section was threaded through vacant lots to avoid condemnation of homes. The net result is the condemnation of the town of Castle Rocks right to expand north. People can move towns can't! I would like someone within the BPA to please explain the logic (if any exists) behind this route creation and selection.
- 14704-14 How dose the BPA propose to mitigate for all the lost tax dollars Cowlitz and Clark county will not receive? If the BPA simply pays off the counties with a one time payment how will that make up for all the lost revenue for the life of the line? I think it would make more sense for the county to lease the land to the BPA and charge the same yearly rate as the land use tax around the line. That would be a more fair way of mitigating. Has the BPA considered this?
- 14704-15 Has the BPA researched the proposed crossing site on the Cowlitz River?
- I have lived at [address] for 12 years. I am an avid bank angler and the river is a short distance from my property. I say a short distance because the river is unstable in this section. I have personally seen the river shift dramatically from eroding the west bank in front of my property to going to the complete

- 14704-11 We apologize for the misunderstanding. BPA listened to and read all comments provided to us during and after the official scoping period. We continue to do the same for comments received after the official close of the Draft EIS comment period. Pre- and post- scoping comments were summarized and categorized for study and inclusion in the Draft EIS. These comments provided guidance to BPA and helped define the scope of the proposed project and provided additional information for BPA to consider. We have responded to all comments received on the Draft EIS in the Final EIS. The Draft EIS comment period provides an opportunity for people to bring additional issues or specific circumstances to BPA before a decision is made.
- 14704-12 Please see the response to Comment 14306-4.
- 14704-13 Please see the responses to Comments 14632-3 and 14674-1.
- 14704-14 Please see the response to Comment 14291-3.
- 14704-15 Please see the response to Comment 14493-7.

14704-15 opposite side and eroding the east bank. The river can erode 10 to 20 feet of river bank in a single winter. I have seen this happen several times. What happens is the silt coming out of the Toutle River builds up and creates sand bars and forces the river to move away from the newly created sand bar. Then a stronger higher water level washes away that sand bar , creates a new one some other place and the river changes course again. The only natural occurring mechanism that has slowed this process down is the growth of trees. The installation of the Central Option 1 will wipe out at least a 150' swath of these trees permanently causing the river to once again erode the bank.

14704-16 I believe the selection of this crossing site so close to convergence of the Toutle river is a very poor choice. The Toutle river has an ongoing issue with the silt from the 1980 eruption of Mt St. Helens. In fact the Army Core of Engineers has just opened up the scoping period for a project to deal with the sediment coming from the Toutle River.

14704-17 The better and wiser choice in my opinion would be to cross the Cowlitz River more north in the proposed Grey Line area where the river has been stable for 50 years or more, and the ground is solid rock. The Toutle River could then be crossed at the Toutle River gorge where the banks are high and also solid rock. The other option would be the BPAs existing ROW that crosses the Cowlitz in Lexington. That part of the river is already diked on both sides, has survive the 1980 flood, and proven it is reliable.

14704-18 In summary: I would like to formally request to re-open the scoping process and study the Grey Line and the Oregon routes.

14704-19 I have read through the original scoping meeting comments of 2009. These people could see the logic. Most said to use your existing ROW or go further east. Four years later a completely different group of peoples comments are the same. If everyone on our side of the process is coming up with the same conclusion when given the same facts then what is wrong with the BPA? Why is the BPA drawing a different conclusion? Is there some political reason? Are we not being told all the facts? I can only hope the Army Corps of Engineers can read the facts and draw a better conclusion than the BPA and move this line away from Castle Rock onto a more suitable less populated route.

Sincerely,

Brian Agren

cc. US Army Corps of Engineers

14704-16 Silt and sediment issues in the Toutle River do not impact siting of the project alignment at this location and crossing of the Toutle River. Any potential contributions of silt or sediment by the proposed project would be mitigated through use of best management construction practices (BMPs) and appropriate erosion control mitigation measures. Section 15.2.8, Recommended Mitigation Measures, includes the following mitigation measures that address sediment control during vegetation clearing, construction, and operations:

- Incorporate standard forest road drainage design BMPs into access road design to reduce erosion (road grading, ditching, drainage dips, culverts, armoring where necessary, discharging road drainage onto solid stable ground, etc.).
- Use standard erosion control measures (BMPs) during vegetation clearing in the right-of-way.
- Remove and dispose of sediment properly, away from surface waters in an upland location out of floodplains.
- Conduct construction, operation, and maintenance activities along or near streams during dry periods.
- Minimize traffic or avoid traffic on access roads during the rainy season.

Table 3-2, Mitigation Measures Included as Part of the Project, includes the following mitigation measures that address sediment control during vegetation clearing, construction, and operations:

- Prepare and implement a SWPPP for construction activities to lessen soil erosion and control stormwater runoff.
- For the SWPPP, use management practices contained in the Washington State Department of Ecology, Stormwater Management Manual for Western Washington (e.g., use silt fences, straw wattles, interceptor trenches, or other perimeter sediment management devices; place them prior to the onset of the rainy season and monitor and maintain them as necessary throughout construction) (<http://www.ecy.wa.gov/pubs/0510030.pdf>).
- Install culverts or bridges for access roads in the dry season or during low-flow conditions if possible to minimize sediment delivery to streams.
- Limit tracking of soil onto paved roads by gravelling road approaches, washing vehicle wheels, and cleaning mud and dirt from paved roads to reduce sediment delivery to roadside ditches and nearby streams.
- Install and maintain water and sediment control measures at all water bodies (including dry water bodies) crossed by access roads or otherwise impacted by surface disturbance.

14704-17 BPA considered a northeastern route and a route using its existing right-of-way on the West Alternative. We are aware of the conditions at each of the potential Cowlitz River crossing locations that these routes would use. With this information in mind, BPA's Preferred Alternative remains the Central Alternative using Central Option 1. Please also see the response to Comment 14565-19.

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- 14704-18 Please see the responses to Comments 14638-4 and 14642-3.
- 14704-19 BPA considered a wide range of issues to identify a preferred alternative, and considered the many and varied public comments. Areas of consideration included impacts to people, the environment, cost, and engineering issues. The Draft EIS documents expected impacts. We have been working with and will continue to work with the Corps, which has regulatory responsibility for issuing permits for projects that occur in waters of the U.S.

14705

From: noreply@bpa.gov
Sent: Sunday, March 24, 2013 10:33 PM
Subject: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
Bonneville Power Administration

Name: Kelly JM Gardner
Organization:
E-mail:
Phone:
Address:

Group type: Private citizen

Please ADD me to the mailing list.

Comment:
Please see attached Word document containing official comments to BPA.

[Attachment](#)

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14705

Peter & Kelly Gardner

March 24, 2013

Re: Comments on BPA’s option F proposal of the I-5 Corridor Reinforcement Project

14705-1 Background: We own two lots in Cowlitz County (parcels _____ and _____) that are affected by option F of the proposed I-5 Corridor Reinforcement Project. We have four home sites established. Tower F/40 is proposed to be located on our property line, along with the transmission lines crossing a portion of property. The proposed tower, lines, and access road would severely impact the livability of our future home and surrounding property, would adversely affect the future value of our property, and would limit future harvests and cultivated products. Our lots are part of the Skyline Ridge Forest Reserve, a gated private community of 63 forested lots, 5+ acres each.

14705-2 We have eight areas of concern: Affecting many small land owners vs. fewer large parcel owners, visual aesthetics, noise, security, tax ramifications, pesticides, mineral rights, and water ways.

All eight areas of concern can be mitigated by adjusting the option F route slightly to the east.

14705-3 ○ Affecting many small land owners vs. fewer large parcel owners
 ■ By moving the lines east, BPA would reduce the number of small land owners affected. The large parcels to the east of our property, and outside our neighborhood, generally consist of large parcels of designated forest land (e.g., parcels # _____, _____, _____). Large parcels have more capacity to absorb the negative aspects of the project due to the much smaller percentage of property affected.

14705-4 ○ Visual aesthetics
 ■ By moving the lines east, and off the ridge, the lines and towers would not be visible to the small land owners immediately to the west, nor visible to the population along the Cowlitz River valley.

14705-5 ○ Noise
 ■ By moving the lines east, the sound level witnessed at our home site, and several neighboring home sites, would be diminished due to the topology and distance to the transmission lines.

14705-6 ○ Security
 ■ By moving the lines east, there would be no new ingress points on to our property which would lower our risk for additional burglaries, vandalism, and general liability claims (that may arise from injury). Also, by moving the lines east, burglary risk for our entire neighborhood would be reduced due to the proposed access road for tower F/39, which is located in what’s been a notorious “backdoor” area into our neighborhood involving burglaries, thefts, garbage dumping, and unsafe firearms discharging documented via police reports.

14705-7 ○ Tax ramifications

2 of 6

- 14705-1 Please see the response to Comment 14097-1. Towers, right-of-way, and access roads are not proposed to cross the commenters' parcels. The line is now proposed to be about 550 feet east of the easternmost parcel.
- 14705-2 Please see the response to Comment 14705-1.
- 14705-3 Please see the response to Comment 14705-1.
- 14705-4 Please see the response to Comment 14627-1.
- 14705-5 Please see the responses to Comments 14705-1 and 14331-2. Yes, moving the transmission line away from a point would reduce noise heard at that point.
- 14705-6 Please see the response to Comment 14705-1.
- 14705-7 Please see the response to Comment 14705-1.

- 14705-7
 - By moving the lines east, we would not unduly lose trees that are critical to preservation of our Open Space Timber Land tax classification. Due to the limited size of small-farm-forests, we are unable to absorb the volume of tree loss that this project could bring. If our tree density drops, we would be forced to reclassify and be liable for mandatory 10 years' worth of compensating taxes.
- 14705-8
 - Pesticides
 - By moving the lines east, the vegetation area regularly sprayed with pesticides would be in a different local watershed. The 63 lots in our neighborhood, and many surrounding lots, would have a much lower risk of ground water contamination affecting personal wells. In addition, moving the lines east would simplify and reduce the cost for oversight that will be needed to ensure our native and cultured vegetation remain pesticide free and able to be certified "organic."
- 14705-9
 - Mineral Rights
 - By moving the lines east, BPA lowers the risk of interference with potential future mining operations granted by our mineral rights ownership.
- 14705-10
 - Water ways
 - By moving the lines east, BPA lowers the risk of interference and contamination of existing seasonal streams originating from within the Skyline Ridge community and specifically on our lots. These seasonal streams affect the health and well-being of the micro-ecosystem of Skyline Ridge.

Additional Comments

- 14705-11

BPA's reasoning regarding multiple lines within the same right of way corridor are applied inconsistently across the same state and regional boundaries. For example, the John Day – McNary line completed in approximately 2012 was run in close proximity to existing lines. The stated reasoning for not selecting the existing BPA owned right of way due to reliability of lines in close proximity is therefore moot and non-viable in the context as presented in the EIS.
- 14705-12

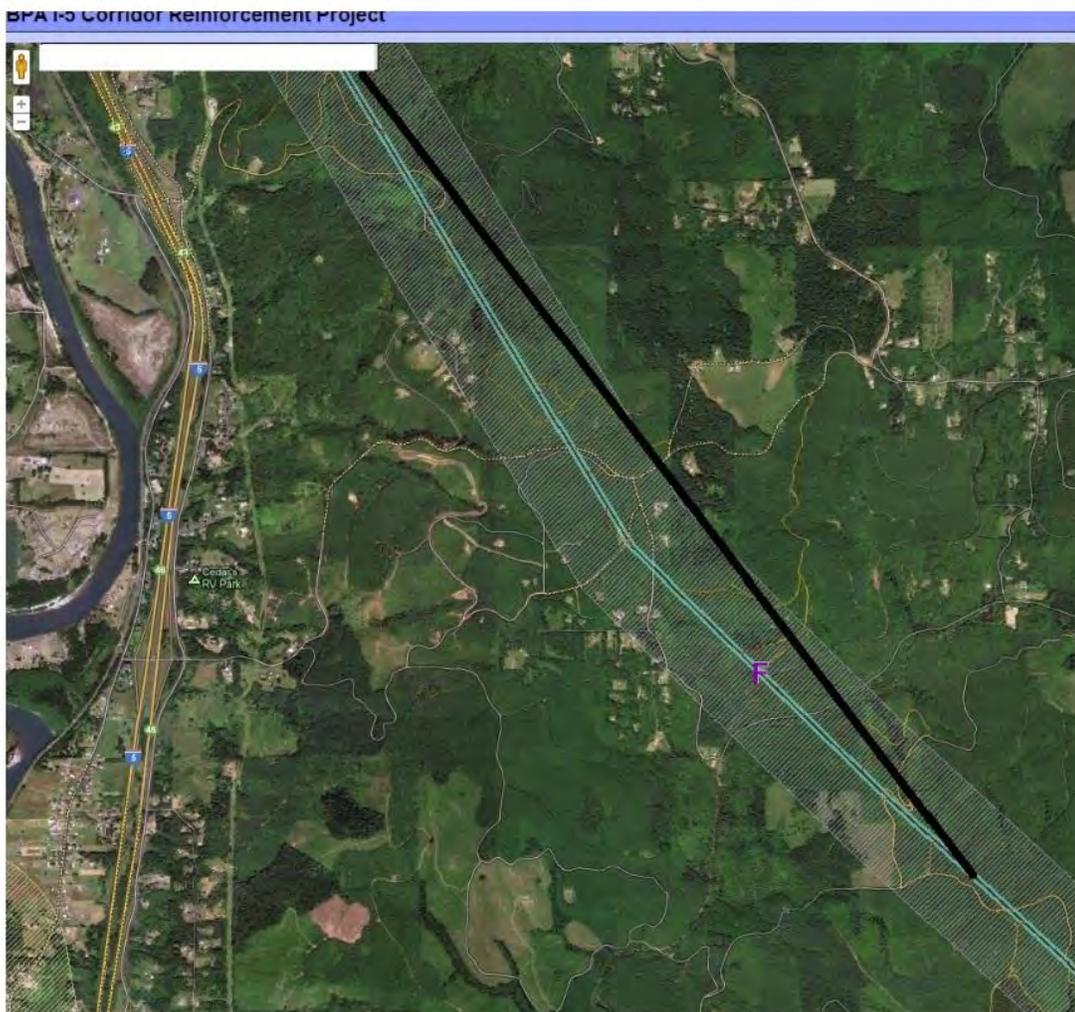
BPA's choice of additional paths in 2010 was based upon old, stagnant, and erroneous data . The BPA team indicated their conversations and communications with Weyerhaeuser for the prior six (6) years did not specify that ownership Skyline Ridge community and all the property therein to WREDCO, a wholly owned and operated subsidiary of Weyerhaeuser, into 5+ acre lots for Small Farm Forestry designations as required by law in the state of Washington. This development was presented to prospective buyers as suitable and eligible for this specialized tax classification for those land owners managing and maintaining forestry plans with Cowlitz County and under the requirements of the state of Washington. The maps BPA presented in the Fall of 2010 for public commentary did not show Skyline Ridge nor the subsequent dwellings– even though BPA was made aware of the existence of the said divisions and home sites at numerous public meetings.
- 14705-13

Recently, BPA survey contractor's entered the Skyline Ridge Community with what could be perceived as, and may in fact have been, unlawful authorizations. BPA should have known the authorization from a Real Estate representative was not sufficient authorization to enter a private gated community. This

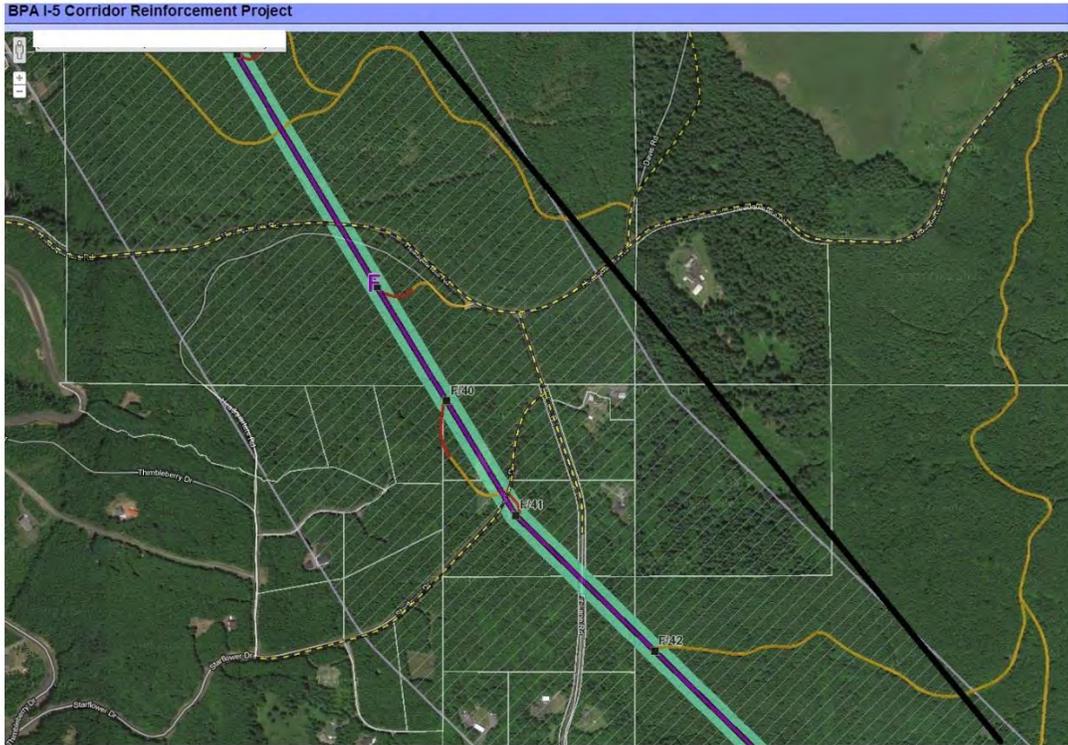
- 14705-8 Please see the response to Comment 14705-1.
- 14705-9 Please see the response to Comment 14705-1. If BPA decides to build a line, BPA would meet with landowners to discuss conditions of right-of-way agreements and compensation.
- 14705-10 Please see the response to Comment 14705-1.
- 14705-11 Although BPA would not violate any regulatory criteria in locating the new line next to an existing line, there is the inherent reliability benefit of not locating the two lines in the same right-of-way and avoiding the risk of both lines being out at the same time due to a natural event such as a landslide. Line proximity is only one of the many issues considered in identifying a preferred alternative. See also the response to Comment 14110-1.
- 14705-12 The project was first proposed and announced in October 2009. From comments collected during the initial scoping period, BPA developed additional route segments and substation sites and announced them to the public. Landowners along the new route segments were notified and invited to comment on the project in 2010. BPA has continued to collect and consider information from the public throughout the siting process.
- 14705-13 While BPA created and adjusted many maps for public meetings and the project website, we were not able to show all details, roads or dwellings within the project area. We appreciate property owners pointing out communities, neighborhoods and dwellings that may otherwise be difficult to see from aerial maps or existing data.
- 14705-14 BPA pursues private property access through a formal permission to enter property process initiated by our Realty Services Department. Access rights are typically granted through existing easement documents or permission to enter property forms signed by the landowner. BPA staff and contractors in the field should be able to identify themselves and provide confirmation of their right to be on a property. If a landowner has any question or concern about the presence of BPA contractors on their property, they should ask for a contact number and call it immediately to confirm the contractors right to be there. The survey crew apparently received verbal permission to enter the subdivision from someone not fully authorized to grant access. In this situation the survey crew was not aware that additional permission would be necessary. Survey crews will be more careful in the future when using verbal permission to access private property for the project.

14705-14 shows a blatant disregard for personal property by the BPA. This also does not foster community relationships of trustworthy stewardship as expressed by BPA's Executives for a core message regarding its mission in the Pacific Northwest.

14705-15 Please see refer to images below for illustrative examples of how moving the proposed lines slightly east, off of our property, adjacent properties, and out of Skyline Ridge Forest Reserve, would affect fewer land owners, would keep the lines out of sight from our community, the sound abated due to distance and topology, won't introduce and/or improve unauthorized ingress points, wouldn't force small-farm-forestry operations to fall out of Open Space Timberland tax classification (inducing mandatory 10 year compensating taxes due), would keep pesticides off our vegetation and out of our wells, wouldn't contaminate or interfere with naturally occurring seasonal water ways, and wouldn't interfere with the mineral rights of land owners.



14705-15 Please see the response to Comment 14705-1.



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14706

From: noreply@bpa.gov
Sent: Friday, March 22, 2013 4:03 PM
Subject: 14706: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
Bonneville Power Administration

Name: Leslie D Ryan-Connolly
Organization: WA Recreation and Conservation Office
E-mail:
Phone:
Address:

Group type: Government (federal, state, local)
Group type: State Agency / Government

Please ADD me to the mailing list.

Comment:

14706-1

The Washington State Recreation and Conservation Office (RCO) would like you to be aware of several recreation, conservation, and salmon recovery sites within the proposed I-5 Corridor Reinforcement Project. These sites were funded with either state or federal funds and are protected for the original grant purpose. Any conversion of the property to other uses would need to be approved by RCO in advance. The Bonneville Power Administration's proposed transmission line project may impact one or more of these projects. Attached is a spreadsheet of the RCO funded projects by the recreation map set. You can find out more project information about each grant on our website with the Project Search tool, <http://www.rco.wa.gov/prism/ProjectSearch.aspx> I hope this information is helpful as you proceed to the next level of the project. Feel free to add me to your contact list for any RCO grant related inquiries for BPA projects.

[Attachment](#)

- 14706-1 The attached spreadsheet of RCO projects has been reviewed with RCO staff. Two sites in the Washougal River Greenway have been identified as potentially being impacted by the proposed project during construction. Trails in this area cross the existing BPA right-of-way that contains two 230-kV transmission lines that are proposed to be rebuilt onto a double-circuit structure. This would then make room for construction of the new 500-kV line. BPA met with RCO and the City of Camas on May 21, 2014 to exchange information and concerns. BPA will continue to work with RCO staff and local governments to identify specific impacts to these and other recreation resources and discuss potential mitigation.

14706

Washington State Recreation and Conservation Office
Grants Located within I-5 Corridor Reinforcement Project

RCO Grant #	Project Name	Project Sponsor	Funding Program
Map 6-1A			
66-010	Riverside Park	Cowlitz County	State Bonds
67-043	Tam-O-Shanter Park 67	Kelso Parks & Rec Dept	Land and Water Conservation
69-610	Statewide Water Access 69-71	Dept of Fish & Wildlife	Bonds
83-047	Bike Pedestrian Trail	Kelso Parks & Rec Dept	Bonds
01-1218	Baxter Creek Culvert Replacment Project	Cowlitz County	Salmon Federal Projects
03-1362	Kelso Babe Ruth Field Light Replacement	Community Foundation for SWW	YAF - Maintaining
03-1371	Riverside Park Soccer Field Renovation	Cowlitz County Parks & Rec	YAF - Maintaining
04-1002	Baxter - Beaver Creek Fish Passage	Cowlitz Conservation Dist	FFPPP Grants
04-1187	Nesbit - Trib to Coweeman River	Cowlitz Conservation Dist	FFPPP Grants
04-1190	Pursley - Unnamed trib to Delameter Ck	Ron and Sara Pursley	FFPPP Grants
04-1544	McDonald - Turner Cr.	Cowlitz Conservation Dist	FFPPP Grants
04-1612	Lacamas Prairie Restoration	Dept of Natural Resources	WWRP - State Lands Restoration
04-1769	Andrews-Turner Cr.	Cowlitz Conservation Dist	FFPPP Grants
05-1349	Mallett - Baxter Cr R3	Cowlitz Conservation Dist	FFPPP Grants
05-1547	Rauth: Coweeman Tributary Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
05-1549	Zmrhal's Coweeman River Project	Cowlitz Conservation Dist	Salmon Federal Projects
06-1733	Castle Rock Riverfront Trail Extension	City of Castle Rock	WWRP - Trails
06-1821	CR Riverfront Trail Extension	City of Castle Rock	Aquatic Lands Enhancement Acct
06-2344	Castle Rock Riverfront Trail Extension Enhancement	City of Castle Rock	WWRP - Trails
07-1674	Zmrhal/Rauth Coweeman Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
07-1850	Kelso Rotary Skate Park	City of Kelso	YAF - New
07-2013	Roller, Ed Jr. - Salmon Creek R6	Cowlitz Conservation Dist	FFPPP Grants
08-1741	Monahan Creek Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
11-1306	Andrews Home Place Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
11-1378	Andrews Alberti Site Stream Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
11-1379	Nesbit Tree Farm Stream Restoration	Cowlitz Conservation Dist	Salmon Federal Projects
12-1169	Coweeman River Bedrock Channel Restoration	Lower Columbia River FEG	Salmon Federal Projects
12-1365	Riverfront Trail Enhancement	City of Castle Rock	WWRP - Trails
12-1382	Coweeman River CWS Riparian Restoration	Cowlitz Conservation Dist	Salmon Federal Projects

14706

Map 6-1B			
02-1233	Wolverton Facility Improvements	Wolverton Mountain Gun Club	Firearms & Archery Range Rec
12-1168	WRIA 27-28 Nutrient Enhancement	Lower Columbia River FEG	Salmon Federal Projects
Map 6-1C			
69-032	Moulton Falls 69	Clark County Parks Dept	Bonds
69-610	Statewide Water Access 69-71	Dept of Fish & Wildlife	Bonds
69-710	69-71 Recreation Site Acq Ph 1	Dept of Natural Resources	Bonds
84-701	Woodland Camp Expansion	Dept of Natural Resources	Bonds
91-080	Lewis River Greenway - 1992	Clark County Parks Dept	WWRP - Water Access
95-027	Haapa Boat Launch	Clark County Parks Dept	Boating Facilities - Local
96-1143	Lewis River Lowlands	Clark County Parks Dept	WWRP - Urban Wildlife
96-1157	Lewis River Tr. (Bells Mountain Trail)	Clark County Parks Dept	WWRP - Trails
97-027	Lucia Falls	Clark County Parks Dept	WWRP - Water Access
97-1204	Haapa Park	Clark County Parks Dept	WWRP - Water Access
02-1233	Wolverton Facility Improvements	Wolverton Mountain Gun Club	Firearms & Archery Range Rec
02-1506	Doty Habitat Restoration Project	Fish First	Salmon Federal Projects
05-1533	Doty-Edwards Cedar Creek	Fish First	Salmon Federal Projects
05-1590	Lockwood Creek Riparian	Clark Public Utilities	Salmon Federal Projects
06-1882	East Fork Lewis Riparian Habitat	Clark County Parks Dept	WWRP - Riparian Protection
06-2165	East Fork Lewis - Reach 17	Columbia Land Trust	Salmon Federal Projects
06-2173	East Fork Lewis Reach 6/Dean Creek	Clark County	Salmon Federal Projects
07-1545	Wooldridge- Mill Creek R5	Clark Conservation District	FFPPP Grants
07-1691	Lockwood Cr Phase 3	Lower Columbia River FEG	Salmon Federal Projects
07-1692	Lower Dean Creek Restoration	Lower Columbia River FEG	Salmon Federal Projects
09-1362	Lower East Fork Lewis River Floodplain Restoration	Clark County	Salmon Federal Projects
11-1004	Yacolt Burn Motorized Trail Bridges & Culverts	Dept of Natural Resources	NOVA Off-Road Vehicle
Map 6-1D			
67-701	DNR-Multiple Site Acquisitions	Dept of Natural Resources	Land and Water Conservation
69-715	Statewide Road Right of Way	Dept of Natural Resources	Bonds
70-701	Sites Acquisition	Dept of Natural Resources	Land and Water Conservation
75-716	Cold Creek Acquisition	Dept of Natural Resources	Land and Water Conservation
85-705	Larch Mountain Trail	Dept of Natural Resources	Bonds
92-606	Lacamas Lake	Dept of Fish & Wildlife	Boating Facilities - State
93-157	Washougal River Boat Launch	Camas Parks & Rec Dept	Boating Facilities - Local

14706

96-1198	Tenny Creek Park	Clark County Parks Dept	WWRP - Local Parks
97-1328	Sandy's Swimming Hole	City of Washougal	ALEA TEMP Program
98-1289	Camp Currie	Clark County Parks Dept	WWRP - Local Parks
98-1293	Lalonde Creek Park	Vancouver Parks & Rec Dept	WWRP - Local Parks
99-1232	Pleasant Valley Maintenance	Prairie Soccer Club	YAF - Maintaining
00-1464	Camp Currie Phase 2	Clark County Parks Dept	WWRP - Local Parks
00-1656	Yacolt ORV Bridges 2000	Dept of Natural Resources	NOVA Off-Road Vehicle
01-1220	Larson Creek Fish Passage Project	Lower Columbia River FEG	Salmon Federal Projects
02-1183	Maple Crest Park	Vancouver Parks & Rec Dept	WWRP - Local Parks
04-1573	Lower Washougal Restoration-Phase 1	Lower Columbia River FEG	Salmon Federal Projects
05-1289	Lower Washougal River Greenway	City of Camas	Land and Water Conservation
06-1895	Lacamas Lake Shoreline	Clark County Parks Dept	WWRP - Riparian Protection
06-1968	Washougal River Trail - Camas Segment	City of Camas	WWRP - Trails
06-2023	East Image Park Acquisition	Vancouver Parks & Rec Dept	WWRP - Local Parks
06-2182	Lower Washougal Restoration - Phase II	Lower Columbia River FEG	Salmon Federal Projects
07-1686	Little Washougal Restoration Ph 4	Lower Columbia River FEG	Salmon Federal Projects
08-1159	Lauren Neighborhood Park	Vancouver Parks & Rec Dept	WWRP - Local Parks
08-1180	Lacamas Prairie Natural Area 2008	Dept of Natural Resources	WWRP - Natural Areas
10-1004	McRae-Mill Creek R8	Clark Conservation District	FFFFPP Grants
11-1012	Yacolt Nonmotorized Trailhead Development	Dept of Natural Resources	NOVA Nonmotorized
11-1614	Cocklin Properties LLC- Mill Creek R9	Clark Conservation District	FFFFPP Grants
12-1177	Lacamas Prairie Natural Area 2012	Dept of Natural Resources	WWRP - Natural Areas
12-1394	Marina Breakwater Dock Electrical Renovation	Port of Camas-Washougal	BIG - Tier1
12-1612	Lacamas Prairie Restoration	Dept of Natural Resources	WWRP - State Lands Restoration

14707

NATHAN HYDE

03/24/2013

Nathan Hyde

[address]

My comments on the I-5 Corridor Reinforcement Project

14707-1 I join my fellow Castle Rock citizens in whole heartedly opposing the construction of power lines just north of the city of Castle Rock. The city has recently undergone much urban improvement that has required significant effort and expense. This little town is by no means rich. In fact, our average income level here is quite low and we have a high percentage of people that are living in poverty. The improvements in Castle Rock are noticeable. We strive for a wholesome, healthy, clean, small town atmosphere. Your proposed power line project would essentially ruin much of what our city has been working for. We have a wonderful river trail that many people use on a daily basis. The construction of the power lines would visually impact the river that is a center of much of Castle Rock's history.

14707-2 The choice to bring these power lines through Castle Rock is mysterious. Why should we experience the discomfort for the construction of power lines that will carry 75% of the power it transports to Oregon? Shouldn't the people of Oregon be bearing the majority of this burden? Isn't there a law that states this very concept? I am wondering why this law can be ignored.

14707-3 I am very familiar with the river area you are intending to cross with your power lines. I cannot conceive of a worse place to cross the river. You say in your environmental impact statement that there is no social impact to construction here. This is ridiculous. I have been fishing at this very sight for much of the last 30 years of my life. This is a place where many of the fishermen in the area have frequented for decades. I would venture to say that I could put a very lengthy list together of people that have used this area for outdoor activities of various kinds. The area has been used by the Cowlitz Tribe on their annual canoe trip down stream. I know this because for the last two years I have visited with tribal members as they camped in a place that would be pretty much right under your power lines. People use this area often. Your assertion that there is no significant social impact to construction on this site is inaccurate to say the least. I know many of the people that live in this area and I do not know one that has been inquired of as to the how the area is used by people. I am wondering how you can state that there is no social impact if you have not even investigated at all?

14707-4

14707-5

14707-6 The river banks in this area are notoriously unstable. All one has to do is go to this area and observe the banks and he will see there is a big problem with bank stability. Did you guys even look at this?

14707-7 The west side of the river here is an area completely unique to the Lower Cowlitz River. In 1996 the 100 year flood deposited a large sand and gravel bar that changed the course of the Cowlitz River. The former river channel remained and now this channel has filled with water and is abundant in wildlife activity. A beaver has dammed the outlet of this pond and raised the water level in the pond by a foot or two. Young salmon (and probably steelhead) venture into this pond when the water is high and grow

- 14707-1 Please see the response to Comment 14674-1.
- 14707-2 Chapter 1 describes the need for the project. Please see the responses to Comments 14333-4 and 14494-2. In analyzing a proposed project, NEPA does not require that any particular party - such as potential beneficiaries of the project - bear the impacts of that project.
- 14707-3 Section 6.2.2, Impacts Common to All Alternatives, discusses recreational fishing impacts. Please also see the response to Comment 14493-2.
- 14707-4 BPA is consulting with the Cowlitz Tribe to identify areas of concern and will take those areas into account during the environmental process. BPA would avoid and minimize damage to cultural sites where possible. For those that could not be avoided, mitigation would be identified.
- 14707-5 Please see the responses to Comments 14364-2 and 14493-2.
- 14707-6 Please see the response to Comment 14493-7.
- 14707-7 Please see the response to Comment 14480-3.

14707-7 here. When the water level rises again at the time for smolting the young salmon migrate out of the pond and into the river. Chinook salmon, coho salmon, steelhead, beaver, bald eagle, red legged frogs, western toads, muskrat, numerous species of duck and fish eating birds, kingfisher and many other species that we have not observed utilize this one of a kind habitat. We suspect that the pond area is being used as a nesting area by waterfowl. Would any of these creatures be affected by the construction of power lines? You bet they would. The very area you propose to construct on is the favorite roosting site for a bald eagle that we have been observing for years. The trees where this bird roosts would have to be removed. What about the beaver? Would it be bothered by the power lines? Do you know? If the beaver leaves he does not maintain his dam. If the dam is not maintained it will fail and the level of water in the pond will drop. This could prove to be disastrous for the salmon and other fish that inhabit this one of kind area on the Cowlitz River. Construction of power lines at this site has the potential to greatly harm a unique habitat that this river system greatly needs. Do we really need to take the chance? Is there another option?

14707-8 I was at the Castle Rock town meeting where the BPA presented ideas and allowed townspeople to speak for a few minutes. There was a voice of reason I heard that evening. An older lady, I do not know her name but she presented an idea that I believe has much merit. What if we used the money that has been proposed for the power line construction and invested it in conservation? Is it possible that we could save enough energy through conservation to eliminate the need for more power lines? What is the price tag for this project? The last number I heard was 430 million or something like that. It seems to me that amount money could be effectively used to improve conservation and eliminate the need for more lines. How much money would it cost to form a team that does evaluations of individual residences and even helps in installation and purchase of energy saving devices? I mean we all want to save some money right? If someone could help me save \$50 on my energy bill each month I would be all for it. There are a so many ways to go with this idea: Revisit to encourage and remind people, extra bonuses for those that consistently adhere to their individual 'energy plan', reminder emails and mailings, summaries of individual residence energy usage as compared to 'energy plan'. I have to say that there would be many people that would love to be part of a team that gets to bring good news to people and help them save money...AND ELIMINATE THE NEED TO FURTHER IMPACT PEOPLE AND THE ENVIRONMENT.

14707-9 My current address is [address], Castle Rock , WA. My land sits right next to the lot where you would be constructing the power lines. It seems to me that we have already given to the county and state. We agreed to let the Army Corps deposit dredge spoils on our land in the early 80's. It completely changed things here. We used to have a naturally reproducing forest. We do not have that now. We are very responsible and generous people. However I have to say that we have given enough. We can feel very good that by sacrificing our land and forest we have saved the people of Oregon and Washington the expense of having to deal with material in the rivers that can impede transport. We have worked hard and been patient in seeing our land finally recover to some degree from the deposition of dredge spoils. And since we do not have much money we have not been able to build on our lands as others have. And this makes it very attractive as a place to build your power lines. With all due respect I would like you to consider that we are heavily impacted by this proposal even though we do not have houses on this land.

14707-8 Please see the response to Comment 14144-2.

14707-9 Please see the response to Comment 14097-1.

14707-9 | We have given enough...would you ask a man that has already given one kidney to give his remaining one?

14707-10 | I firmly believe that the energy conservation route is the answer that we are looking for. When I say we I mean the people of Castle Rock and the BPA. Perhaps Castle Rock could even be a kind of beta test town for a conservation program. I think you would find that the people of Castle Rock would rally around such an idea that could prove beneficial to so many.

Thank you for considering my comments.

Nathan Hyde

Castle Rock, Washington

14707-10 Please see the response to Comment 14144-2.

14709

From: noreply@bpa.gov
Sent: Monday, March 25, 2013 12:22 AM
Subject: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
Bonneville Power Administration

Name: Leanne L Watson
Organization:
E-mail:
Phone:
Address:

Group type: Private citizen

Please ADD me to the mailing list.

Comment:

[Attachment](#)

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March 24, 2013

Leanne L. Watson

Bonneville Power Administration
I-5 Corridor Reinforcement Project

To the I-5 Corridor Reinforcement Project:



East Fork of the Lewis River

- 14709-1 Attached is a picture of one of the areas the BPA's preferred route would decimate. This route would level pristine forestland, native vegetation, habitat for bald eagles, and streambeds for our steelhead population. No fish and animal counts can accurately capture the value or majesty of this area.
- 14709-2 No amount of mitigation can fix the environmental toll this route would take.
- 14709-3 And yet, the BPA is pressing ahead with this option.

- 14709-1 Please see the response to Comment 14480-3.
- 14709-2 Comment noted.
- 14709-3 BPA considered a wide range of issues in identifying a preferred alternative, including impacts to people, the environment, cost, and engineering issues. Should BPA decide to build the project, it would do so from a loan that would be paid back from rates charged our ratepayers, not from tax dollars. BPA has proposed this project as the best way to address the problem, but will not make a final decision about whether to build or not until the Final EIS is completed.

14709

14709-3

It's pressing ahead with this option because a more western group of vocal homeowners, who knowingly purchased land on a BPA right-of-way with existing lines, is upset that the organization might exercise its right to use that space in the best interests of the community.

The BPA is pressing ahead with this option, even though it's not the most cost efficient solution. Our government is struggling to fund key infrastructure projects, such as our failing bridges, and is fighting to finance education and other vital services. Choosing this route is a disgusting waste of resources when there are cheaper alternatives available.

This BPA is pressing ahead with this option using language that falsely positions this route as the only way to ensure the safety and continuity of our power system, when in fact there are myriad other solutions—solutions that take less from our pocketbooks and leave our natural heritage intact.

Look at this picture once more. How will you—and I'm asking every person who has a vote in this decision—sleep at night knowing that you destroyed this piece of land when there are cheaper, less environmentally degrading options? How will you explain this decision to your children and grandchildren, who are counting on you to preserve our natural environment—the thing that makes the Northwest unique and worth living in? Can you honestly tell them that this place wasn't worth saving? This picture represents one tower, one 150-foot swath. Multiply this impact by 79 miles. It's a terrible image.

Here's the good part: The money hasn't been spent. The herbicides haven't been poured. The trees haven't been felled. The streams haven't been damaged. Not by this project. Not yet. And you have the power to keep it that way.

Sincerely,

Leanne L. Watson

Affected property address:

3 of 3

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14710

CITY OF WASHOUGAL, HONORABLE SEAN GUARD, MITCH T KNEIPP

03/22/2013

14710-1 Please see attached comments from the City of Washougal. Thank you. Mitch Kneipp

March 22, 2013

VIA E-MAIL & U.S. MAIL

Bonneville Power Administration
I-5 Corridor Reinforcement Project
P.O. Box 9250
Portland, OR 97207

RE: City of Washougal's Comments on Bonneville Power Administration's (BPA) I-5 Corridor Reinforcement Draft Project Environmental Impact Study (DEIS)

Dear Sir/Madam:

14710-2 Thank you for the opportunity to comment on BPA's I-5 Corridor Reinforcement Project's Draft Environmental Impact Statement. The City of Washougal recognizes the BPA's statutory obligation to provide power to the region and appreciates the efforts of BPA in seeking public input regarding the proposed expansion. The DEIS considered four (4) routing alternatives, each with several options, for the proposed 500-kV transmission line and BPA has stated that the Central Alternative, with Central Option 1, is their preferred alternative (DEIS Summary Page S-4). However, as a statement of fact the DEIS has no alternative that does not run through the City of Washougal or our Urban Growth Area. It is noted throughout the DEIS that Segment 52 (the only segment in Washougal) is "common" or "shared" by all alternatives. The City of Washougal should not be forced by BPA to fully bear the burdens of the entire region's electrical demands.

Following is a discussion of our concerns in Washougal:

Views

14710-3 It is clearly evident that the proposed towers will have a significant impact on views in our community. In the Visual Resources Chapter 7 of the DEIS at page 7-16 it states:
"The views of the alternative in the Camas and Washougal areas include unobstructed and distant views across the open, rural landscape; close-up views from roads and residences along the right-of-way in Camas; and views from SR 14. The rebuilt 230-kV lines and new 500-kV towers would be of a different shape and larger than existing towers. From the Lewis and Clark Camp National Historic Site along SR 14 the greater size and shape of the towers would not dominate the view (see Figure 7-6). Although there would be noticeable changes, they would not become dominant when compared to existing conditions. Visual impacts would be low because much of this area is rural and agricultural with fewer viewers.

- 14710-1 Thank you for your comments. Specific comments are addressed below.
- 14710-2 Common to all action alternatives is the need to connect to the existing 500-kV system at Troutdale. Because of dense development around existing BPA rights-of-way north of the Columbia River over the last several decades since the original transmission lines were built, BPA determined it was better to use its existing right-of-way and river crossing for a new line into Troutdale than develop a new right-of-way through the City of Camas and the City of Washougal or a longer new right-of-way through the Urban Growth Area.
- 14710-3 The visual assessment in Chapter 7, Visual Resources, acknowledges that visual resources would be affected with localized areas of high impacts on some parks, natural areas and residences. Appendix E includes a more detailed description of each segment and highlights a rationale for Segment 52's rating. Through project design and siting and mitigation measures, BPA has worked to minimize residual impacts to visual resources for all action alternatives. Mitigation measures are provided in Chapter 3, Project Components and Construction, Operation, and Maintenance Activities; Chapter 7, Visual Resources; and Appendix E.

Photographs and simulations are included in the Final EIS for the Camas/Washougal area (see Figures 7-16 through 7-19). The viewpoints included for this area illustrate the alignment within a suburban residential context common to all alternatives.

- Impacts would be moderate at local parks and recreational areas where the contrast of larger, different shaped towers in a natural setting would be more noticeable."
- 14710-3 The DEIS states that the new towers would be a "different shape and larger than exiting towers" but then notes "the greater size and shape of the towers would not dominate the view" because "much of this area is rural and agricultural with fewer viewers". The City acknowledges that this narrative is for the entire "Western Alternative"; however, it notes the lack of focus on the urban area of Washougal that is "common" for all alternatives. The existing towers are proposed to increase in height from a current 60-80 feet up to 120-160 feet. Every alternative summary ends by noting there would be an uptick in impacts from "low" to "moderate" when the route passes through "Camas (where there are parks and community greenspace)". Again, no specific focus on the urban area of Washougal, but every alternative runs through our city. Our city is not "rural and agricultural with fewer viewers". In fact, there are existing residential developments of urban density constructed immediately adjacent to the BPA easement and others with preliminary approval. The BPA easement passes through a subarea of the City of Washougal known as Woodburn Hill. This subarea was itself subject to an EIS in order to appropriately develop this beautiful hillside and include development design, plat restrictions, and construction restrictions specifically to preserve the outstanding views of the Portland city lights, Columbia River Gorge National Scenic Area and Mt. Hood. The subarea also seeks to preserve, to the extent possible and feasible, the natural beauty of Woodburn Hill itself as a view amenity from within the city. These views are one of the key features that make Washougal special.
- 14710-4 Washougal acknowledges that there is an existing BPA easement through our City. However, to rely on this as an existing condition that can't be further impacted shows the lack of focus on Washougal in this DEIS. Every alternative negatively impacts our City and the only applicable proposed mitigation is to "Site new towers next to or near existing towers and use a similar tower type" (DEIS Section 7.3.8). However, as noted the towers will be twice as tall, but in addition they won't even be a "similar tower type" as demonstrated in the DEIS in Appendix B Figure 2-23.
- 14710-5 There will be significant negative impacts to views for a large number of properties in our community. This will directly and negatively impact the assessed value of the affected properties.
- Assessed Value
- Property taxes, which are derived as a function of assessed value, are an important source of general revenue for a city. The impacts to view will have a significant negative impact on our assessed value, thereby reducing revenue to the City. The DEIS acknowledges this fact by stating, the "project would cause long-term decreases in government revenue by diminishing the base value of property subject to property taxation" (DEIS Section 11.2.2.4). This could affect the City's ability to provide core services at the level citizens have come to expect.
- 14710-6 The City recognizes there are many factors that influence assessed value (i.e. size of house, number of bedrooms/bathrooms, construction type, etc.). But BPA can not deny that, all things being equal, views can influence property value. The DEIS references three studies (DEIS 11.2.2.5) that were performed to provide an analysis of the affect of transmission lines on property values. Of the three studies, two were

14710-4 Please see the response to Comment 14710-3.

14710-5 Please see the responses to Comments 14710-3 and 14291-3.

14710-6 Please see the response to Comment 14140-2.

14710-6 performed by BPA's chief appraiser. The first study performed by BPA found a slight increase (1.5%) in property sale amounts for properties located near BPA easements for the Portland/Vancouver area in the early 1990's. The second study, which was an update to the first study, found "a small but negative impact of from 0 to 2 percent for those properties adjacent to the transmission lines as compared to those where no transmission lines were present." The DEIS goes on to state in this same section, "Although this study identified a negative effect, the results are similar to the earlier study and the differences are relatively small".

The third study "High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrances Effects" by James Chalmers and Frank Voorvaart, The Appraisal Journal 2009, looked at the value of property sales over the period from 1998-2007 in Connecticut and Massachusetts near an existing 345-kV transmission line. The study concluded:

"In the four study areas examined here, there is no evidence of systematic effects of either proximity or visibility of 345-kV transmission lines on residential real estate values. Encumbrance of the transmission line easement on adjoining properties does appear to have a consistent negative effect on value, although the statistical significance with which it is measured varies ...

14710-7 The professional literature cited, combined with the results reported here, support the position that a presumption of material negative effects of HVTLS on property values is not warranted. An opinion supporting HVTLS effects would have to be based on market data particular to the situation in question and could not be presumed or based on casual, anecdotal observation. It is fair to presume that the direction of the effect would in most circumstances be negative, but the existence of a measureable effect and the magnitude of such an effect can only be determined by empirical analysis of actual market transactions."

So where the study found there may be no affect on property values based on "proximity or visibility" there is a "consistent negative effect on value" given the encumbrance of the easement for the transmission line itself. What is most informative in this third study is the fact that it notes that the affect of High Voltage Transmission Lines needs to be based on, "market data particular to the situation in question and could not be presumed or based on casual, anecdotal observation". Even the most recent study again performed by BPA's chief appraiser titled "The Price Effects of HVTLS on Abutting Homes" just published last week in The Appraisal Journal notes on page 60 that, "These outcomes, like all studies of this sort, are derived from sample data intended to be representative of their markets. Such samples are not generalizable to other markets due to differences in climate, government, terrain, vegetation, and local attitudes toward HVTL proximity and views." The DEIS fails to provide any "market data particular to the situation in question" showing the direct impact to Washougal. Instead it provides a simplistic analysis of the impacts to property values. BPA should perform a market specific property value impact analysis for Washougal given that we share with Camas the only urban area with urban densities affected by the project.

14710-7 Please see the response to Comment 14140-2.

In regard to measuring a direct impact to Washougal, there is not enough market evidence to render a meaningful statistically significant conclusion for Washougal alone. Properties directly affected by the project would be appraised individually and any impacts the project may have would be measured through the appraisal process.

Undergrounding

14710-8 The DEIS acknowledges that the City of Washougal commented on the possibility of undergrounding the transmission lines through our populated urban areas. BPA also acknowledged that undergrounding the transmission line "appears to be technically feasible" but dismisses undergrounding as an option because of a significant cost increase (Appendix D Section 1.4). However, the DEIS also only analyzes the entire length of the project in terms of undergrounding dismissing the option as cost prohibited without looking at the shorter length through the Washougal urban area. This shorter length is approximately 3/4 of a mile within the city limits with only an additional 1/2 mile in the city's urban growth boundary. The City recognizes that the costs would be greater; however, with no alternative routes the City is forced to bare the impact of the proposal regardless of alternatives and options.

The DEIS also notes that operational, system loss, environmental, performance and reliability concerns would need to be addressed. However, no analysis was performed to substantiate these concerns for any segment length. BPA just states it will cost too much and dismisses the idea completely.

14710-9 BPA provided one existing photo showing the towers looking north from Parkersville Landing near the Port of Camas/Washougal along with a simulation of what the new towers would look like (DEIS Appendix E Figure 3-6). Based on this the DEIS states in Appendix E Page 35, "The overall contrast of Segment 52 is Weak: the new towers, though noticeably larger and less harmonious, replace existing towers and therefore do not dominate the landscape in comparison to the existing landscape. With an overall Weak contrast and a landscape rating of Medium, the overall visual impact of the segment would likely be Low." What if the lines were underground and the existing towers were removed? What would the visual impact of the segment then be? Undergrounding is appropriate mitigation for the urban Segment 52 through Washougal, not installing "noticeably larger and less harmonious towers". The concept of undergrounding the utility has been given inadequate consideration by BPA in the DEIS. The City of Washougal asserts that a more thorough and precise analysis of undergrounding Segment 52 within the urban area be performed, and it be determined that the added cost is warranted given the urban context.

14710-10

Conclusion

14710-11 In May of 2012, the City Council of Washougal adopted Resolution 1052 (attached) that urged BPA to consider an alternative route for the I-5 Corridor Reinforcement Project away from our urban area. In addition, it noted no alternative should be considered that includes routing of power lines above ground through the City. This DEIS fails to adequately address the significant adverse environmental impacts to the City of Washougal. It is clear that this project will have significant impacts to views and assessed value thereby limiting our ability to provide core services to our citizens. And undergrounding is dismissed as too expensive without adequate and appropriate consideration.

No alternative has been seriously evaluated that does not impact the City of Washougal. Consistent with the 40 CFR 1508.20 the Bonneville Power Administration needs to avoid the impacts by looking at an alternative that does not affect the City of Washougal; if the impacts can't be avoided then they need to be minimized by undergrounding the transmission lines through the urban area; and finally if the

- 14710-8 Please see the response to Comment 14283-1.
- 14710-9 An underground transmission line requires a permanent right-of-way, which includes clearing all trees and tall shrubs, if present. This condition must be maintained for the life of the project to allow access and maintenance of the line. Impacts to visual resources would occur because vegetation would be cleared from these sites during construction and vegetation types and patterns would be altered long term. There is also the potential for visible infrastructure such as transition stations, where the overhead line transitions to underground and again to above ground. These transition stations can be large for double-circuit 230-kV and 500-kV lines. BPA understands the aesthetic appeal to views without the presence of utility lines.

Undergrounding the transmission line is discussed in Section 4.7.7 and Appendix D. Additional underground studies of the Washougal/Camas and the Castle Rock areas are in Appendix D1.

Addition photographs and simulations are included in the Final EIS that represent 4 viewpoints in the Camas/Washougal area (see Figures 7-16 through 7-19).

- 14710-10 Please see the response to Comment 14283-1.
- 14710-11 The resolution of the commenter is noted. Please see the response to Comment 14339-2 concerning the consideration of potential routing alternatives to the Washougal and Camas area. The potential impacts of the proposed project on views in and near the City of Washougal are discussed in Chapter 7 and Appendix E, and potential property value impacts are discussed in Chapter 11. Please see the response to Comment 14283-1 concerning the consideration of underground line alternatives for the proposed project.

- 14710-11 | impacts cannot be avoided or minimized then mitigation through compensation needs to be provided for the property value lost in order for the City to ensure core services to its citizens are maintained.
- 14710-12 | Finally, the City is aware of comments submitted by our neighboring City of Camas through the law firm of Foster Pepper dated March 21, 2013. The City asserts the same as the City of Camas to those similar arguments as they would be applicable to the City of Washougal.
- 14710-13 | The City of Washougal hopes that the Bonneville Power Administration will purposely review these comments and take appropriate action to avoid, minimize, and mitigate the impacts to Washougal. We welcome your comments and are available for further discussion.

Sincerely,

Sean Guard
Mayor of Washougal

Attachment: City of Washougal Resolution No. 1052

cc: Congressional Delegation

Office of the Governor
Corps of Engineers
State Energy Office
State Department of Commerce
Clark County
City of Camas

RESOLUTION NO. 1052

- 14710-14 | A RESOLUTION expressing concern over the siting of 500 Kv power lines above ground and within the City of Washougal and further requesting the appropriate authority consider alternatives to the placement of said power lines through the City of Washougal as part of an alternatives analysis included in the environmental impact statement for the Bonneville Power Administration I-5 Corridor Reinforcement Project.
- WHEREAS, the City of Washougal is immediately contiguous to the Columbia River Gorge National Scenic Area and enjoys numerous scenic vistas throughout the community; and
- WHEREAS, the Bonneville Power Administration is currently preparing a Draft Environment Impact Statement on a project identified as the I-5 Corridor Reinforcement Project; and
- WHEREAS, the Bonneville Power Administration is currently considering no alternative to the funneling of a 500Kv power line above ground and through the City of Washougal, with new towers up to 160 feet tall replacing existing 75 feet tall towers; and
- WHEREAS, the Washougal City Council held a workshop to gain information on this topic; and

- 14710-12 Comment noted. Please see the responses to Comments 14677-1 through 14677-28.
- 14710-13 BPA appreciates the City of Washougal's comments on the Draft EIS.
- 14710-14 Please see the response to Comment 14710-11.

WHEREAS, at that workshop the City Council were apprised of the efforts of the City of Camas requesting that the appropriate authorities consider alternatives to the placement of said power lines through their City as part of an alternatives analysis included in the environmental impact statement; and

WHEREAS, the City Council of Washougal stands in support of the efforts of the City of Camas; and

WHEREAS, the City Council of Washougal has similar concerns regarding the negative impact of the above ground 500Kv power lines on the City of Washougal, especially the detracting from the scenic vistas of the Columbia River Gorge National Scenic Area;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Washougal, Washington, as follows:

Section I

14710-14 We urge the appropriate authorities to insist that Bonneville Power Administration consider and select alternatives, through the alternatives analysis portion of an environmental impact statement, that route the I-5 Corridor Reinforcement Project away from the urban area known as the City of Washougal, and to further insist that no alternative be considered that includes routing of power lines above ground through the City of Washougal.

Section II

We urge appropriate authorities to support the City of Camas in the realization of their vision for economic development opportunities and to consider and select alternatives, through the alternatives analysis portion of an environmental impact statement, that route the I-5 Corridor Reinforcement Project away from the urban area known as the City of Camas, and to further insist that no alternative be considered that includes routing of power lines above ground through the City of Camas.

PASSED by the Council for the City of Washougal at a regular meeting this 21st day of May, 2012.

City of Washougal, WA

By: Sean Guard, Mayor

ATTEST:

Jennifer Forsberg, City Clerk

APPROVED AS TO FORM:

Donald English, City Attorney

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14711

From: noreply@bpa.gov
Sent: Friday, March 22, 2013 7:38 PM
Subject: 14711: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
 Bonneville Power Administration

Name: Richard none van Dijk
Organization:
E-mail:
Phone:
Address:

USA

Please ADD me to the mailing list.

Comment:

14711-1

BPA has been very selective in the renderings shown as to what the line would look like on the various segments. This selection aims to minimize the hideous impact these 150-200' towers would have. For example the picture of Camas is deceptive and in the rural areas they zoom waaaay out on a foggy day so you have to look for the line and of course there are no homes anywhere to be seen. Attached a picture file with what I think is a realistic rendering even with the rudimentary tools at my disposal. I challenge BPA to recreate, release to the public and include in the DEIS/FEIS a truer rendering from the same vantage point using your high tech software and powerful computers. The as is shows 60'-80' towers and proposed towers of up to 180' – close to triple the current height and that does not include the higher towers leading up to the 325' behemoth at the river's edge. Top two pictures are along Hwy 14 and the bottom two coming down the hill

[Attachment](#)

- 14711-1 Landscape modelling and analysis was done by experienced professionals using geographic data and industry standard software, modelling techniques and standardized methods.

Please see the response to Comment 14171-10 for further explanation of the methodology used in the visual assessment.

Photographs and simulations are included in the Final EIS for the Castle Rock, Merwin Lake and Camas / Washougal area (see Figures 7-8 through 7-19). The viewpoints included for the Camas / Washougal area illustrate the alignment within a suburban residential context.

14711



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14712
 MARSHALL WATSON
 03/25/2013
 March 24, 2013

Marshall Watson

[address]

Bonneville Power Administration
 I-5 Corridor Reinforcement Project
 [address]

To the I-5 Corridor Reinforcement Project:

14712-1 Every citizen should be concerned about the financial aspects of this proposed action. Not only would the Central Route cost more upfront, but it would have both ongoing and secondary costs that are not being accounted for:

14712-2 -If this route is selected, when the houses along this route are next assessed for taxes, we will certainly see a hit to the revenues that we need to maintain other public services, like roads, schools, and the police and fire departments. I have not seen any study on the impact of reduced property values on the small towns along this route. Will Yacolt, Amboy, or any other small towns see a reduction in tax revenue that would impact their ability to serve their citizenry?

-Use of the Central Route would impact the ability of many of the persons along the route to farm trees, or otherwise make a living from their land, effectively robbing people of their livelihood. Instead of a one-time compensation, would you consider periodic payments to compensate for the loss of resources that would otherwise produced revenue on a recurring basis?

o Do not forget that downstream businesses, like sawmills, would be impacted as well; should they be forced out of business, would they not deserve to be compensated?

14712-3 -While there is a rough plan to compensate folks for their stolen land, there is no mention of how to repay those whose land is not taken, but who could suffer damages as a result of your construction. Your proposal would be using a private road that is paid for out of my pocket to gain access to the property you are seizing. If it is destroyed by numerous passes of logging and construction vehicles, do I get to send BPA the bill for new asphalt and gravel?

-My land is not in the specific path of destruction as proposed, but the hum of your lines will be audible, and your towers will be visible, both of which will hurt my resale value; why is there no compensation for those of us on the margins of your project?

14712-4 -Why was BPA not able to come to an agreement that would allow them to use the routes formerly used by the Trojan nuclear power plant? EIS section 4.7.2.6 mentions that the existing lines are in use by PGE,

- 14712-1 Please see the response to Comment 14467-2.
- 14712-2 Please see the response to Comment 14291-3. Sections 11.2.2.6 and 11.2.2.7 describe the potential impacts of the project on agricultural and timber production, respectively. For family tree farmers, the line was located very close to property lines where possible to minimize impacts to tree farming operations. Section 11.2.8, Recommended Mitigation Measures, describes measures to mitigate potential impacts.
- 14712-3 BPA would need to acquire perpetual easements for this project, paying a one-time payment based on market value for these rights. BPA cannot pay compensation to landowners where no land rights are acquired. BPA repairs or compensates for damages on access roads that occur from construction or maintenance activities.
- 14712-4 The lines the commenter refers to are owned and operated by PGE and are presently in use by that utility. There is no capacity available for BPA use on those lines (see Section 4.7.2.6, Trojan Nuclear Plant Facilities) and there is no room in the existing easement to add another transmission line. The existing transmission lines along the West Alternative are owned by BPA and there is enough room in the existing right-of-way along most of the route to add a new transmission line. That is why the West Alternative is considered a viable alternative. Because the routes formerly used by the Trojan nuclear power plant were not available to BPA, the number of homes that could potentially be impacted by a new line along that route was not studied. In addition to homes and land use, BPA considers other resources when siting a transmission line, choosing a preferred alternative, and whether to build a new line. These resources are described in Chapters 5 through 22.

14712-4 but so are the lines on the Western Alternative, and that was not a deterrent for considering that easement for new lines. Perhaps this was just a rumor, but I heard that this would only impact 4 homes along the entire route; if the Central Route is being considered as an option over the existing route because it impacts 327 homes instead of 3000+, should you not consider a route that only impacts 4 homes to be even more preferable?

14712-5 On a personal note, I remember 25 years ago when my grandfather gave up one of his favorite pastimes: fishing for steelhead on the East Fork of the Lewis River, which flows through our property. My grandfather was concerned about the tragically low populations he was seeing. We watched those populations diminish even further for many years, but are finally seeing the slightest hint of recovery. What impacts will these lines, and the deforestation required to install and maintain them, have on the recovery of steelhead populations in the East Fork?

Sincerely,

Marshall Watson

Affected property address:

[address]

- 14712-5 The EIS summarizes distribution of special-status fish species in Section 19.1, Special-Status Species. Table 19-1 and Map 19-1C indicate that the East Fork Lewis River at this crossing downstream of the commenter's property (V-5) is used by Lower Columbia steelhead and river lamprey. NOAA Fisheries has designated this reach as critical habitat for Lower Columbia steelhead. Table D-1 in Appendix K indicates that adult salmon and steelhead production at this crossing ranks in the 50th percentile among all anadromous fish-bearing streams crossed by the transmission line corridors.

The EIS summarizes impacts to fish resources in Section 19.2, Environmental Consequences. Table B-1 in Appendix K indicates that riparian vegetation at this crossing is well stocked with large conifers, and large woody debris recruitment potential is high. But, because the stream is wide (~50 feet), the ability of riparian vegetation to fully block solar radiation to the stream is limited. Therefore, impacts to stream temperature would not be as great as if the stream were narrower. Instead, impacts from clearing of streamside vegetation would be moderate as noted in Table B-1.

Table D-1 in Appendix K indicates that the stream reach along the transmission line corridor is capable of producing less than 1 adult steelhead per year. This estimate was based on salmon and steelhead models in the Lower Columbia Salmon Recovery Plan. It incorporates information about fish habitat quantity and quality along the affected reach. Because impacts to fish habitat are moderate, the entire production in this reach is not lost. This reach is not rated as high-priority in the Recovery Plan; nonetheless, degradation of habitat conditions is contrary to Recovery Plan objectives.

14713

From: noreply@bpa.gov
Sent: Monday, March 25, 2013 12:27 AM
Subject: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
Bonneville Power Administration

Name: Finn H Watson
Organization:
E-mail:
Phone:
Address:

Group type: Private citizen

Please ADD me to the mailing list.

Comment:

[Attachment](#)

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Dear BPA:

14713-1

I want to grow up on this river. I want to swim in its cold waters and search for crawdads like my daddy did when he was little. I want to hunt for mushrooms and eat breakfast cereal with wild huckleberries and thimbleberries.

Please save my river. Please don't destroy it by sending high-voltage power lines through my forest. I'm just 18 months old, so I don't have many words. But I do have pictures of me playing in this amazing place. I hope you can see how much I love it, and how much it's worth to the next generation.

Sincerely,
Finn Watson, age 1 ½



14713-1 Comment noted.

14713



3 of 5



14713



5 of 5

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14714

Mr. Mark Korsness, Project Manager
 I-5 Corridor Reinforcement Project
 Bonneville Power Administration
 P.O. Box 9250
 Portland, OR 97207

RE: Bonneville Power Administration I-5 Corridor Reinforcement Project Draft EIS Comments

Dear Mr. Korsness:

14714-1 We are a group of homeowners who live adjacent to the "P Line" which has been selected by your agency as the preferred alternative for the I-5 Corridor Reinforcement Project. We offer the following comments:

CONCERNS ABOUT THE PROCESS:

As you know, the "P Line" alternative was added in 2010 after the official public scoping period had closed in 2009. We were told on numerous occasions by BPA personnel that although our comments¹ were being submitted after the scoping period ended, they would be treated as if they were submitted during the official scoping period (which of course had closed prior to the addition of this alternative).

14714-2 A careful examination of the Draft EIS does not show any instances where our specific comments in regards to environmental impacts of the location of the "P Line" within approximately 3000 linear feet of the Riparian Management Zone (RMZ) and Wetland Management Zones (WMZ) of the North Fork of Lacamas Creek, adjacent to our properties were addressed.

Since our comments on this critical environmental issue do not seem to be addressed in the Draft EIS, we are concerned that our comments were not even evaluated. We also question whether we have been treated fairly and equitably in this process considering that the alternative that most impacts us was added after the close of the official scoping period. We believe your agency has made an error in locating a portion of the "P Line" adjacent to our properties and this alignment will result in significant impacts to water quality and wildlife. We have previously submitted most of the information contained herein. We are submitting these comments again as "official" comments to the Draft EIS.

THE "P LINE": LOCATION

14714-3 The "P Line" adjacent to our property is located along the western boundary of the Department of Natural Resources (DNR) ownership in Section 25, Township 3 North, Range 3 East, Willamette Meridian. The enclosed Exhibit "A" shows proposed towers P/22, P/23 and P/24 along that boundary.

¹ Comment submitted to BPA by Bolton Minister dated May 26, 2011

14714-1 Thank you for your comments. Specific comments are addressed below.

14714-2 Please see the response to Comment 14704-11.

14714-3 Comment noted.

In 2009 and 2010 the DNR logged a portion of its property in that section under the file name "Oceanspray Timber Sale #84262". Enclosed (as Attachment #1) is a copy of the State SEPA document for that timber sale. According to that document, the DNR conducted a detailed study of the property to make sure that any logging conformed to the Washington State Forest Practices Act (Chapter 76.09RCW). As a result of the study, DNR developed a Forest Practices Habitat Conservation Plan (HCP) that conformed to the Act. DNR determined that the easterly branch of the North Fork of Lacamas Creek adjacent to our property was a "Type 3 Water" (the State's definition of a "Type 3 Water" is enclosed as Attachment #2). The creek is classified as "Type 3 Water" because it provides a significant habitat for fish and wildlife, and is highly significant for protection of downstream water quality.

14714-4

We have personally observed the presence of cutthroat trout and salamanders in the creek have seen many black tailed deer, black bear, bald eagles, osprey, owls and blue heron in and around this section of Lacamas Creek. The DNR, following the requirements of the Forest Practices Act, established Riparian Management Zones (RMZ) and Wetland Management Zones (WMZ) which range between 175 and 190 feet wide per side for the Type 3 Streams to protect water quality, provide corridors for wildlife and maintain a habitat for fish and amphibians (see Mitigation Measures Attachment #1 SEPA document). These RMZ and WMZ were not logged or disturbed in any way during the Oceanspray timber sale (see Exhibit "A").

The alignment of the proposed "P Line" is almost entirely within the riparian and wetland management zones of this "Type 3" stream along approximately 3,000 linear feet of the western boundary of Section 25 and Section 24 to the north. This alternative would result in the clearing of native vegetation, logging mature trees, and building towers in this riparian and wetland management zone which would be in direct conflict with the Washington State Forest Practices Act and the Forest Practices Act Conservation Plan (HCP) that was established for the Oceanspray Timber Sale. Conducting these activities would significantly impact an ecosystem that was specifically protected by the State of Washington when they logged this area. The problem with this proposal is that the alignment of the "P Line" goes up the creek corridor rather than simply crossing the creek. Not only will this alternative destroy the local ecosystem, it will also seriously impact the downstream water quality by increasing turbidity, spreading noxious weeds and invasive species, raising stream temperatures and adding pollutants to the stream system through the use of herbicides that will be used to control vegetation under the transmission lines.

DEIS RESPONSES:

The Draft EIS addresses the impacts of the disturbance of these sensitive areas in several chapters.

14714-5

CHAPTER 5-FISH:

This chapter addresses the long term impacts to streams. Section 5.3.15.1 states: "There will be long-term impacts to streams temperature caused by continued vegetation removal

- 14714-4 Please see the response to Comment 14097-1. The proposed line has now been moved about 1/2 mile to the east on WDNR land. Updated analysis has been included in the appropriate resource chapters in the EIS.
- 14714-5 Please see the response to Comment 14714-4. The relocated transmission line corridor is not within the stream corridor referenced by the commenters. The length of stream potentially affected by the alternative has been reduced through this realignment. A natural falls on Lacamas Creek blocks all upstream migration of anadromous fish (Byrne et al. 2002). The proposed project would affect the resident fish population.

Byrne, J., T. Bachman, G. Wade, and J. Weinheimer. 2002. Draft Washougal Basin Subbasin Summary. Northwest Power Planning Council report. 61 p.

- maintaining less shade and woody debris." The section also states that elevated temperatures will have high impacts on fish and amphibians.
- Comment:** The alignment of the "P Line" adjacent to our properties would require the removal of over 10 acres of native vegetation from the RMZ and WMZ zones of the North Fork of Lacamas Creek. This would have a significant impact on local fish and wildlife, particularly amphibians.
- 14714-5 **Section 5.3.15.2** states: "Adherence to stream buffers would minimize impacts on fish".
- Comment:** The design of the "P Line" DOES NOT adhere to the avoidance of impacts to stream buffers. The current design would wipe out 10 acres of prime riparian and wetland management buffers.
- Section 5.3.15.3 – Impacts Unique to the Central Alternative:** This section addresses forested stream crossings and impacts on fish bearing streams for shade and increased temperature.
- Comment:** This section only addresses the impacts of stream crossings but does not address the construction of the transmission line corridor straight up a stream corridor. The impacts associated with stream crossings would likely be significantly less than the impacts associated with construction up an entire stream corridor.
- Chapter 15-Surface Water**
- In section 15.1.4 of this chapter, it states that portions of Lacamas Creek are 303(d) listed for elevated levels of fecal coliform and low levels of dissolved oxygen and pH. The Washington Department of Ecology began studying water quality in the Lacamas Creek drainage in February of 2011; this study is ongoing. Publication number 11-030102 summarizes the findings to date. Sample site #6 is located in Camp Bonneville downstream of this portion of the North Fork of Lacamas Creek. The study shows that Lacamas Creek, approximately a half mile upstream of sample site #6, is 303(d) listed for elevated levels of dissolved oxygen and pH, elevated temperature and elevated fecal coliform.
- 14714-6 **Comment:** If the "P Line" is constructed in its current location, directly upstream of sample site #6, the removal of over 10 acres of vegetation and woody debris from the riparian buffer zone will impact water quality in this 303(d) stream by elevating water temperature, increasing sediment loading and potentially exacerbating other water quality concerns such as low dissolved oxygen and high fecal coliform.
- Section 15.22.2.1 – Construction:** This section addresses the impacts to fish bearing streams by removal of vegetation and road construction.
- Comment:** Proposed access roads to construct and service towers P/22 and P/23 would require four (4) road crossings of Type 3 streams (see Exhibit "A"). These access roads would be built in Section 25, entirely within the RMZ and WMZ zones of the Type 3 streams, requiring additional clearing and logging. This would increase turbidity in the stream during construction. As these road crossings will be permanent they will have long-term, highly negative impacts on water quality and the riparian corridor of these Type 3 fish bearing streams.

14714-6 Please see the response to Comment 14714-4.

Since this whole Section of proposed line has moved east about 0.5 mile, the access roads needed to the new proposed tower locations have changed. Most of the access roads are existing roads in need of some level of reconstruction or improvement.

The mitigation measure the commenters quote include the words "where possible." To maintain safe operation of the transmission line, all tall-growing vegetation would need to be removed, even in riparian areas. BPA is keenly aware of the resource values riparian areas contribute to the ecosystem and is studying ways to maintain as much low-growing vegetation as possible in these areas.

Please see the response to Comment 14160-1 regarding vegetation control. In addition, as stated in Table 3-2, Mitigation Measures Included as Part of the Project, herbicide application would be limited to hand spraying at least 100 feet from all fish-bearing stream channels and only EPA-approved herbicides that are non-toxic to aquatic resources would be used.

The private driveway and private Vinemaple road were not constructed to support heavy construction equipment and would require BPA to completely reconstruct these private accesses.

Section 15.2.8 – Recommended Mitigation Measures: This section lists mitigation measures. One of the mitigation measures stated is: "Avoid or minimize clearing riparian vegetation where possible, especially where it may affect a 303(d) listed water".

14714-6 **Comment:** The proposed alignment of the "P-Line" DOES NOT avoid or minimize clearing of riparian vegetation along the North Fork of Lacamas Creek which flows directly into a 303(d) listed water.

Another mitigation measure listed in this section recommends minimization of herbicide applications adjacent to streams.

Comment: We have been told by BPA officials that herbicides cannot be sprayed within the riparian zones. If this is true, this section of the "P Line" would require long term hand removal of more than ten (10) acres of vegetation in the RMZ and WMZ zones along over 1/2 mile of transmission lines.

Chapter 16-Wetlands

Section 16.2.2.1 – Construction: This section states: Towers and roads would be located to avoid wetlands as much as possible. Clearing trees and shrubs from medium-or high-quality forested and scrub/shrub wetlands and wetland buffers along right-of-way and new access roads also would be a long term, high impact. Conversion of medium- or high-quality wetlands and buffers to low- or medium-quality would remove habitat, alter hydrology through a decrease in evapotranspiration or increase in direct precipitation onto soils, increase soil and water temperatures from lack of shading, and possibly introduce weed species. Dense vegetation common in scrub/shrub wetlands, offering cover, breeding habitat, and foraging opportunities would be lost or modified. Vegetation removal would also cause impacts to species diversity and richness and continuity with adjacent habitat.

14714-7 **Comment:** The "P line" location along the west line of Section 25 would be built over the RMZ and WMZ zones of the North Fork of Lacamas Creek. Along this Type 3 stream, there are many pockets of forested wetlands associated with the stream. There is also a large pond that was manmade that is partially on Craig Shigeno's property and partially on DNR land. The proposed transmission line would be built right over the top of this pond. The pond has been there for over 35 years and shows up as a wetland on the National Wetland Inventory Maps (See Exhibit "D"). The clearing and construction of the transmission corridor would have a significant impact on the functions and values of these wetlands. Tower P/23 is proposed to be built within the wetland buffer just south of the pond. The proposed access road to maintain the tower would also be built within the wetland and the associated wetland buffer. The pond is home to fish and amphibians. The overhanging vegetation provides shade and cover to these species. The pond is frequently visited by many migratory birds. Ducks mate and hatch young in the vegetation around the pond. Clearing the vegetation within the wetland buffer will raise water

14714-7 Please see the response to Comment 14714-4.

- 14714-7 | temperatures, impact water quality, and destroy breeding and foraging opportunities for all of these species. The presence of the transmission corridor will have a permanent, highly negative impact on this ecosystem. The transmission lines and towers will create a hazard for migratory birds including, osprey, blue herons, owls and bald eagles flying into and out of this pond.
- 14714-8 | The access roads to towers P/23 and P/24 would be built partially within the forested wetlands and partially within the RMZ and WMZ zones associated with the Type 3 streams. The four (4) stream crossings would permanently impact the streams and associated wetlands. Water quality in the streams and wetlands would be impacted during construction and long after construction is complete by the loss of riparian vegetation and the runoff from the access roads.
- 14714-9 | **Chapter 17-Vegetation**
Section 7.2.2 states: that removal of vegetation in forested wetlands opens up those areas to non-native invasive plant species and the establishment of noxious weeds.
Comment: The removal of 10 acres of native vegetation in the forested wetlands and Riparian Management zones along the north fork of Lacamas Creek between towers P/21, P/22, P/23 and P/24 would open up those areas to non-native invasive species and noxious weeds.
- 14714-10 | **Chapter 18-Wildlife**
 South of Rawson Road in Section 23 and 24 the "P Line" bisects a designated Washington State Department of Wildlife snag rich area. The area is known as "North Fork Lacamas Snags", a snag rich area for nesting raptors.
Comment: The "P Line" would clear 3 acres of this snag rich area. The Draft EIS lists this as a "high impact". This is discussed in chapter 18 under sections 18.1.2.6 and 18.2.5.2 tables 18-5 and 18-6 and shown on map 18-D.
- 14714-11 | **APPENDIX A – DNR LANDS ANALYSIS**
Section A.2.4.2 Best Practices: This section recommends best practices to accomplish the following objectives concerning the I-5 Corridor Reinforcement Project:
 - Protect water quality and avoid sediment loading into water bodies.
 - Protect sensitive areas and reduce ecosystem impacts.
 - Maintain natural channels, natural stream flow and maintain passage for aquatic organisms.**Comment:** The proposed alignment of the "P Line" from tower P/21 through tower P/24 is in direct conflict with these objectives and fails to implement any of these identified best management practices.
- 14714-12 | **CAMP BONNEVILLE IMPACTS:**
 This branch of Lacamas Creek flows directly into Camp Bonneville to the south. Enclosed (as Attachment #3) is a "Site Description" of Camp Bonneville. This is Section 2 of an environmental review that was performed for the U.S. Army Corps of Engineers, Seattle District under Contract No.DACA87-00-D-0038, Task Order #17. Section 2.2.11 lists threatened and endangered species and Federal and State species of concern in Tables 2.1 and 2.2. If these

- 14714-8 Please see the response to Comment 14714-6.
- 14714-9 Chapter 17, Vegetation, acknowledges that removal of vegetation and land disturbance can expose native plant communities to invasive non-native and noxious weed species. Sensitive areas such as wetlands would be avoided wherever possible and BPA, through its Vegetation Management Program, would address any noxious weeds that may have invaded and established in areas disturbed by the project.
- 14714-10 Please see the response to Comment 14701-14.
- 14714-11 Please see the response to Comment 14714-4.

In general, BPA has sited and designed the project in keeping with the objectives the commenter includes above. With any large construction project in a human and natural environment, impacts will occur. Those impacts are reported in the EIS as well as recommended mitigation measures to try and minimize those impacts.

- 14714-12 Table 18-2, Special-Status Wildlife Species that Occur in the Study Area, lists those special-status species with the potential to occur along the action alternatives (based on preferred habitat) and identifies those that are documented to occur within a 2-mile-wide corridor in the study area based on information in the databases listed in the Sources footnote of the table. Although some species are not officially documented as present in the databases, the project's potential effects on protected species' preferred habitat have been accounted for in Chapter 18, Wildlife.

14714-12 species exist in Camp Bonneville which is ½ mile to the south, it is logical to assume that these species exist partially or wholly along this branch of Lacamas Creek and could be impacted by the project. Even if the species are not found within the impact area, those species that exist within the boundaries of Camp Bonneville could be indirectly affected by any upstream deterioration of water quality caused by this project.

14714-13 Camp Bonneville is currently undergoing an extensive environmental clean-up as a Superfund site. The lead agency in this project is the Washington State Department of Ecology (DOE). Any further water quality degradation caused by this BPA project will further aggravate DOE efforts to clean up the Camp Bonneville site.

ALTERNATIVES TO THE CURRENT "P LINE" ALIGNMENT:

We would like BPA to consider three re-alignment alternatives for the "P Line" that would be far less damaging to the ecosystem on the northern forks of Lacamas Creek.

We have prepared Exhibits "B" and "C" for your consideration which shows two potential realignment options.

The first option, as shown in orange on Exhibit "B" and "C", was actually proposed by the DNR in their comments dated May 10, 2011. As shown in attachment #4 as highlighted, this alignment would head north from tower P/27 across DNR land in Section 25, T3N, R3E, and EK Family Trust timberland in the south half of Section 24 and Longview Timber LLC land in the north ½ of Section 24, then would turn west along the south line of Section 13 on DNR land and intersect the original "P Line" alignment between towers P/17 and P/18. This alignment would for the most part appear to cross streams at or near right angles which would minimize buffer impacts.

14714-14 There is, however, a Type 5 stream that appears to lie beneath the proposed alignment of this alternative for a short distance. Type 5 streams tend to only have seasonal flow and do not support fish. There is also a potential wetland on a Type 4 stream in the SW ¼ of the NE ¼ of Section 24 along this alignment that shows up on the National Wetlands Inventory mapping (see Exhibit "D", National Wetlands Inventory map). While the towers could be located outside of the wetlands and buffers, the transmission lines would still pass over the wetlands. Vegetation clearing under the transmission lines could have a negative impact on those wetlands. Those impacts would, however, be far less damaging than the stream and wetland impacts along the Type 3 stream along the current alignment of the "P Line" on the west lines of Sections 24 and 25 as discussed previously. This alignment would also avoid impacts to the WDFW designated snag rich area known as the "North Fork Lacamas Snags" in the area of tower P/20.

The second option, as shown in green on Exhibit "B" and "C", would, in our opinion, be a better option to reduce impacts to the Lacamas Creek watershed. That option would head north between Towers P/29 and P/30 along the west lines of Section 30 and 19 of T3N, R4E on DNR land and then head west along the south line of Section 13 of T3N, R3E on DNR land and

14714-13 The Preferred Alternative does not cross Camp Bonneville and would not create any direct impacts to Superfund site cleanup efforts. Table 3-2 and Section 15.2.8 list mitigation measures that could be used to prevent sedimentation into streams that flow into Lacamas Creek and across Camp Bonneville.

14714-14 Please see the response to Comment 14714-4.

14714-14

intersect the original "P Line" alignment between towers P/17 and P/18. This alignment would cross DNR land in Section 30 and then go along the west boundary of DNR land in Section 19 and along the south boundary of DNR land in Section 13 of T3N, R3E. This alignment would cross several smaller streams at or near right angles. The stream classifications are mostly Type 4 and 5 streams with much narrower riparian buffer widths than the Type 3 streams along the west line of Sections 24 and 25. Type 4 Stream standard buffer widths are 65 feet. Type 5 Stream standard buffer widths are 15 feet (see Attachment #2). This option would not cross any known wetlands. This option would have far less impacts to the Lacamas Creek ecosystem than the original "P Line" alignment or the first option discussed previously. This option would also avoid any impacts to the "North Fork Lacamas Snags Area".

This option would follow the boundaries of DNR land except for the south mile, where it bisects DNR land. It however would eliminate about a mile of the original "P Line" that bisects DNR land on an angle. The option would be entirely on public land.

A third option would be to realign the corridor to the original "32 Line". That option would locate the transmission corridor high up on a ridge and would have minimal impact, if any, on the Lacamas Creek drainage.

14714-15

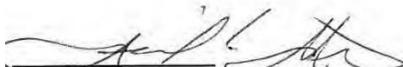
We are many neighbors, and we are speaking with one voice when we urge you to consider and specifically respond to these comments on the Draft Environmental Impact Statement for BPA's I-5 Corridor Reinforcement Project.

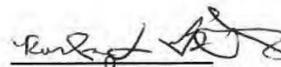
Sincerely,

Vinemaple Road Neighbors


Bolton C. Minister


Lola Minister


April Minister/Smith


Rod Smith

14714-15 Comment noted.

14715

ANOTHER WAY BPA, RICHARD VAN DIJK

03/22/2013

- 14715-1 BPA's hubris has to date failed to address their easily debunked implausible excuses used to back into the predetermined decision to take Oregon off the table.
- BPA needs to fully address all questions and provide us with a complete set of viable and believable answers to everything that is questioned below. If BPA cannot do so, then we fully expect them to start all over again and reopen scoping to include Oregon.

OREGON NEEDS TO BE BACK ON THE TABLE

- 14715-2 The comments below chronicle the event that we believe took Oregon off the table before the I-5 project was released to the public.
- The following assumptions about why the Oregon option was taken off the table are made based on documentation we received from BPA under the Freedom of Information Act (FOIA). The I-5 Corridor Project has been on the books since ~2002 and has always shown several route options through both Oregon and Washington. This was still the case until mid 2009 when there was a change. This culminated in mid/late September when BPA created an Agency Decision Framework (ADF) with all the reasons why the Oregon option was not viable, and BPA went public with the Washington options only.
- We have not been able to find out the real reason why BPA is so adverse to building in Oregon, but you will see that the reasons given for not using Pearl are just as valid for not using the Troutdale routes.

- 14715-3 We believe BPA never intended to build in Oregon, but was nevertheless prepared to go through with the scoping process and writing the Draft Environmental Impact Statement (DEIS) with both Oregon and Washington options included, even though it would take an additional year or two. Why?
- Possibly because nobody would have any reason to complain or ask questions as the whole process would appear to be fair and equitable. Once the decision was made to go to Washington, it would be too late and BPA would build the line as they had originally envisioned – in Washington.
- Unfortunately for BPA, the Department of Energy (DOE) and Secretary Chu put pressure on them to cut corners and do what was necessary to get the line built quickly. Secretary Chu has made comments about how cumbersome the NEPA process is and that it must be streamlined.
- Administrator Wright gave the order to get the line moving and fast. This led to his signing off on the ADF. The ADF had the pros and cons of three alternatives: Oregon and Washington all the way through the DEIS; Oregon and Washington and then drop Oregon during scoping; or Washington only. The pros and cons listed in the ADF are very biased and led to a predetermined decision.

- 14715-4 A walk back in time

- 14715-1 Thank you for your comments. Specific comments are addressed below.
- 14715-2 Please see the response to Comment 14443-1 concerning the elimination of potential routes through Oregon from detailed study in the EIS.
- 14715-3 Please see the response to Comment 14443-1 concerning the elimination of potential routes through Oregon from detailed study in the EIS.
- 14715-4 Please see the response to Comment 14443-1 concerning the elimination of potential routes through Oregon from detailed study in the EIS. While EIS timing issues were discussed at the time BPA was evaluating the feasibility of the potential Oregon routes, the determination to eliminate these routes from detailed study in the EIS was made for other reasons. These reasons are summarized in Section 4.7.2.1, Alternate Routes from Castle Rock, Washington to near Wilsonville, Oregon (Pearl Routes).

2009

Jan, 28

Senator Murray announces \$3.25B borrowing for BPA

Feb, 19

BPA announces four new lines to be built using stimulus funds

Jun, 3

Stephen Wright confirmed as BPA Administrator by Secretary Chu.

Chu said in a statement Thursday that Wright has proven an adept leader, accelerating energy efficiency and renewable energy efforts in the Northwest to meet regional and national objectives. "I am very excited that he has picked up the charge to do that, and he has my full confidence," Chu said

Jun 10

BPA's Liaison in Washington D.C. meets with Secretary Chu to update on the progress ARRA reporting issues. Secretary Chu wants to know if one of the BPA projects could be test pilot for an accelerated NEPA and having an EIS in less than a year

14715-4

Jun 11

Steven Wright sends an email to staff that he wants an action plan by noon on how to meet Secretary Chu's demands for an expedited schedule for this and other projects BPA is working on.

Jun 15

Western Governors Association Meeting

"Secretary Chu also indicated that several of the federal agencies under his watch, including WAPA and BPA, are not moving in a timely manner in facilitating funding opportunities for renewable energy and transmission development. Secretary Chu expressly requested that the Governors contact him directly if any of these agencies are taking actions that will deter private investment in renewable energy and related transmission projects so that he can address these potential impacts immediately."

July 29

Memo Wright to Chu on how the accelerated schedule will be met.

At this point we believe that BPA started working to take Oregon off the table in order to meet a schedule that is politically driven

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	<p>Sep 8</p> <p>Mark Korseness emails to Gary Beck and Larry Bekkedahl that it was Troutdale only.</p>
	<p>Sep 10</p> <p>Date on Version 6 of the ADF which is confirmed by BPA as being the final version, but not so.</p>
	<p>Sep 11</p> <p>Driessen questions why option #3 needs to be included if the decision to drop Pearl had has already been made.</p> <p>How flippantly home taking is addressed, then exaggerated, inflated before becoming a negative for Pearl.</p> <p>Lists the bad things about Pearl to add to the ADF. (The ADF final date predates this email)</p> <p>How the established Project Schedule is driving taking Pearl off the table and how money is being thrown at it.</p>
14715-4	<p>Sept 11-24</p> <p>Lots of emails getting maps finalized for taking to the public</p>
	<p>Sep 17</p> <p>Stephen Wright questions portions of the ADF as he was leaning toward taking the Oregon options through scoping and to then drop it.</p>
	<p>Sep 18</p> <p>Mark Korseness responds clarifying the same arguments as in the FOIA and adds a few more.</p>
	<p>Sep 22</p> <p>Stephen Wright asks for further clarification especially on option 3 and whether the west should be kept in case the east became problematic</p>
	<p>Sep 22</p> <p>Mark Korsness responds with mostly NEPA and process issues and how they can move forward without the Pearl option.</p>
	<p>Sep 22</p> <p>Email exchange between Stephen Wright and Hub Adams – Attorney. All text redacted under Exemption 5 Atty.-client privileges.</p>

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Sep 23

- 14715-4 Stephen Wright decides to drop Pearl based on info put in the ADF by his subordinates.
 Interesting to note that Mark Korseness had determined it was Troutdale only – this before Stephen Wright made the official decision.
 There are plenty of other emails that show that they are doing everything they can to meet a start build date of August 2012.
- 14715-5 The following lists BPA’s stated reasons From the ADF for removing the Oregon options and our reasons why similar known issues would be faced on the Washington side:
 #1
 All Pearl routing alternatives would require a new Columbia River crossing near Longview where there are no existing utilities crossings of the river.
 Our response
 There are no electrical reasons why the breaker ring needed to tap into the Napavine line could not be done in a new bay at the Allston substation. This obviates the river crossing and also a new substation.
- 14715-6 #2
 All Pearl routing alternatives would require very tall towers (up to 450 foot) at the Columbia river crossing that would have lights and overhead ground wire marker balls
 Our response
 Any tower over 200’ requires special markings etc. The Troutdale tower in the middle of the river is currently planned to be 325’. Not known whether it can be built in the middle of the river as the island is too small. Special pilings for the foundation would need to be in bedrock. The geology has not confirmed what that would require. If the middle of the river cannot be used due to reliability concerns, then the towers would need to be even taller – approaching that of those as being too tall.
- 14715-7 #3
 Two Pearl routing options would require new tower and right of way on wildlife refuge island or similarly managed Columbia River lands
 Our response
 The third one doesn’t, it crosses where PGE’s Port Westward generation plant is. BPA will claim they need options. There are no options for crossing at Camas, so why must there be an option at Longview?

- 14715-5 Section 4.7.2.3, Reconfigure Existing 500-kV Lines near Longview Washington, explains why this alternative was considered but eliminated from further consideration.
- 14715-6 BPA has identified a preferred alternative that takes advantage of its existing utility corridor across the Columbia River where there are already towers on both sides of the river and on an island (lone Reef). This avoids the need to develop and clear a new right-of-way where there is none and place new tall marked towers west of Longview where there are no towers.
- The design would remove both 230-kV towers on lone Reef and double-circuit them on one tower making room for the new 500-kV tower. Geotechnical investigations on lone Reef have confirmed that this design would be feasible.
- 14715-7 At the time of the Agency Decision Framework (ADF) referenced by the commenter, various Columbia River crossing options were being considered for a Pearl route. The consideration from the ADF that is noted by the commenter was intended merely to identify potential issues that could be encountered with some of these crossing options.

14715-8	<p>#4</p> <p>To get to the Columbia River, all Pearl routing alternatives would need to go through some residential areas..</p> <p>Our response</p> <p>Reviewed from Google earth, getting through Castle Rock, Vancouver and Camas would have a far greater impact to residential areas</p>
14715-9	<p>#5</p> <p>All Pearl routing alternatives would go through either managed timber lands and/or high use farm/crop fields</p> <p>Our response</p> <p>All non populated routes in WA also go through managed timber lands. As to the crops, this would not be the first line that is built in the middle of a field full of say wheat, vegetables or the like. Would need to work with BLM, US Forest Service and Oregon state lands - could it be the same reason for avoiding Gifford Pinchot?</p>
14715-10	<p>#6</p> <p>The most direct route to Pearl would either go through or near established wildlife areas or near or over private airstrips.</p> <p>Our response</p> <p>The two most direct routes to Troutdale were taken off for Communications (13) and Relics/Artifacts (11).</p>
14715-11	<p>#7</p> <p>One round about route to Pearl would likely take no homes; however it is likely that a least one home and possibly ten homes may need to be taken depending on which route segment is taken.</p> <p>Our response</p> <p>Documents show that many of the segments BPA is proposing to use have the same problem.</p> <p>On many existing right of ways the center line of the tower will be at the minimum allowed 75' from the edge of the right of way – Outside conductor would be ~50' from edge of Right of way.</p>

- 14715-8 Routes to Pearl would impact a different set of residential areas than the routes to Troutdale. The routes to Troutdale were carried forward for more in-depth analysis because they offered a reasonable range of alternatives to consider that included a route using mostly existing right-of-way, a route using mostly public and corporate lands that are managed mostly for timber harvest, a path through southern-most Washington (southern Clark County and the Camas/Washougal area) using an existing right-of-way, and a path across the Columbia River in an existing utility corridor. The routes to Pearl did not offer these advantages. BPA considered a wide range of issues in identifying a preferred route, including impacts to people, the environment, cost, and engineering issues. The Preferred Alternative runs mostly through timbered lands and runs on existing right-of-way through the City of Camas and the City of Washougal.
- 14715-9 BPA identified the Central Alternative using Central Option 1 as its Preferred Alternative. It has the benefit of being located far enough east to significantly reduce the number of homes impacted and is located mostly on large tracts of land managed mostly for timber production and harvest. US Forest Service land is much farther to the east. Routes to Troutdale were developed to include paths farther to the east to avoid homes, placing the line mostly on public and corporate lands that are managed mostly for timber harvest. The Central Alternative using Central Option 1 avoids most homes and places most of the line on timber land. The East Alternative is located farther east, avoids most homes, but places the line on steeper timber land and more severely adversely affects timber land. Going even farther east on to US Forest Service property avoids most homes, but places the line on steeper timber land and more severely adversely affects timber land, adversely affects unique wildlife habitat and recreation areas, and makes the line unnecessarily long.
- 14715-10 Comment noted.
- 14715-11 To clarify, this consideration from the ADF was intended to refer to the need to actually remove homes from the route of the Pearl option, given that they would be partially or fully located within the right-of-way for that option. In contrast, home removal could be generally avoided for the action alternatives considered in detail in the EIS.

	<p>#8</p> <p>The estimated construction cost of a routing alternative in the Pearl corridor ranges from X to XX million depending on alignment, whereas the estimated construction cost of a Troutdale routing alternative ranges from Y to YY million depending on alignment, making the Troutdale plan Z million less expensive</p>
14715-12	<p>Our response</p> <p>The actual figures were redacted by BPA, but \$342Million has been mentioned many times for the Troutdale option and between \$15-69M more for the Pearl option.</p> <p>Note: BPA spends \$850Million per year every year to protect and restore fish and wildlife, but they refuse to consider a one-time expense to protect people.</p>
14715-13	<p>#9</p> <p>Pearl alternatives do not offer a route on an existing Right of Way, whereas the Troutdale plan does</p> <p>Our response</p> <p>There is an existing right of way, which has the Allston-Keeler- Pearl 500KV line in it. For reliability reasons, it should not be used, but could. (Over 80% of BPAs lines run parallel and thus susceptible to a double line failure) BPA will nevertheless argue that it is ok to use an existing right of way which already has the Ross-Lexington 230KV line in it and is an integral part of the I-5 corridor. A double line outage in this corridor would be just as serious as a double 500KV line outage. Portions of the Section 368 energy corridor in Oregon could be used. In Washington, most the existing right of ways are in populated areas, would require widening of the easement and/or the expensive rebuilding of the existing lines using even taller towers. Going through Vancouver and Camas will require many of the existing lines to be rebuilt with taller towers (up to 200')</p>
14715-14	<p>#10</p> <p>Pearl Plan studied with the Troutdale plan requires an additional year for NEPA.</p> <p>Our response</p> <p>Since line has been on the books since ~2002 why the rush now? Pressure from DOE and Sec. Chu wanting this line built now and fast. He has said that the NEPA process takes way too long. Wants an accelerated schedule.</p>
14715-15	<p>#11</p> <p>Pearl plan requires putting twice as many people's lives on hold in regards to property improvements, value, sales, ownership plans, etc</p>

- 14715-12 BPA does not believe that consideration of a Pearl option would protect people, since it is not expected that the action alternatives studied in detail in the EIS would physically harm people. Furthermore, if the commenter is referring to protection from project impacts, the commenter's suggestion would merely serve to shift impacts from one population to another rather than actually protecting people in general.
- 14715-13 Routes to Pearl do not offer vacant right-of-way for the new line, whereas there is a route to Troutdale that does. Operationally it is allowable to locate the new 500-kV line on vacant right-of-way next to the Ross-Lexington 230-kV line, but since they both serve the same basic purpose, namely to move power from north to south and because they would be located side by side on the same right-of-way, they would be subject to the same single right-of-way events such as landslides, high wind, airplane crashes, fires, etc., that could take both lines out of service at the same time, making the system less reliable than if they were on separate routes. The routes to Troutdale through southern Clark County and the Camas/Washougal area use an existing right-of-way. There is no need to widen the right-of-way. This would require existing lines to be rebuilt to taller towers, but would reduce the magnetic field strengths east of the easement.
- 14715-14 Please see the response to Comment 14715-4.
- 14715-15 To clarify, this consideration in the ADF was intended to reflect that a significant number of other people (i.e., those along the Pearl route) - in addition to those along the proposed routes to Troutdale - would also potentially be affected by the project if the Pearl route was carried in detail through the EIS process. It was not meant to be a comparison of which route had more potentially affected parcels and landowners.

14715-15	<p>Our response</p> <p>Not true. It is the other way around - Troutdale plan puts twice as many people's lives on hold. WA has 11,600 parcels and 7,750 landowners.</p> <p>Oregon has 5,900 parcels and 3,100 landowners</p>
14715-16	<p>#12</p> <p>Pearl plan requires involving twice as many County and City governments.</p> <p>Our response</p> <p>Why does it matter how many agencies there are, BPA does not working closely with them anyway. It is more like telling them we are BPA and we do what we want.</p>
14715-17	<p>New/updated reasons for dropping Oregon that coincide with the August map release.</p> <p>#13</p> <p>Pearl Substation Constraints</p> <p>"BPA's Pearl Substation in Wilsonville, Ore., is surrounded by industrial buildings with no room for expansion. The significant challenges in and around the substation and the existing 500KV line would be more extensive than those BPA is proposing at the Troutdale Substation. Fortunately, there is room at Troutdale for expansion near the existing substation".</p> <p>Our response</p> <p>Pearl:</p> <p>BPA already own 24+ acres of land to the west of Pearl which would double the size of the substation. When questioned on that, they said that it is not usable because it is used for drainage, congested with existing towers and that a significant portion is on a long term lease to a transportation company.</p> <p>Troutdale:</p> <p>The area being considered for expansion is a wetland, owned by the Port of Portland and would need to be purchased (estimated value \$1M).</p> <p>It is to the west of the existing Troutdale substation with a Pacific Power and PGE substation and a road in between.</p> <p>This area is even more congested and will require many lines to cross.</p> <p>Would also require the existing 500KV line be moved from the existing substation to the new one as that is where the switching will take place.</p>

- 14715-16 This consideration from the ADF was just one of many, but it does reflect the inherent increasing difficulty of transmission line siting when crossing more, rather than fewer, local jurisdictions and wanting to work through issues with each of them.
- 14715-17 There is vacant land to the west of BPA's Troutdale Substation that could be used for the new substation. There is no vacant land to the west of BPA's Pearl Substation. Some lines would need to be reconfigured at Troutdale. Though there are wetlands on Port property, the Port is in the process of creating a master plan for industrial development (including for utilities) and is working with the Corps to create and enhance existing wetlands that can coexist with the new development.

14715-17	<p>The old and new substations will need to be linked with a 500KV line.</p>
	<p>#14</p> <p>Columbia River Crossing at Longview</p> <p>“Crossing the Columbia River downstream of Longview presented a major engineering and environmental challenge. To provide sufficient clearance for marine traffic, this crossing would require special towers more than 400-feet tall, more than twice the height of standard towers and among the largest in North America. The new towers at this crossing would require highly visible special markings and strobe lights. The larger the towers, the more likely they are to pose risks to aircraft. Crossing the river there would also require building new towers on islands that are managed for wildlife, or may become, wildlife refuges. Crossing the Columbia River at Troutdale allows use of a narrower, existing river crossing”.</p> <p>The engineering challenge: Our response:</p> <p>The Northwest has built many of these massive towers in the days when the engineering challenges were solved on the drafting table and a slide rule. Today BPA is a world leader with state of the CAD computers and they say this is a challenge.</p> <p>Existing tall towers include:</p>
14715-18	<p>8 at Longview with a span of 2900', requires clearance for marine traffic.</p> <p>4 at St Johns with a span of 3250-3800', requires clearance for marine traffic.</p> <p>2 at Crow Butte with a span of 4000, requires clearance for river traffic.</p> <p>4 at Pasco with a span of 3250-3550', requires clearance for river traffic.</p> <p>Longview Crossing: Our response</p> <p>There are three proposed crossings downstream from Longview. Only the eastern one is on an island and has potential wildlife impacts. The middle and western ones are not in refuges. The western route crosses at the Port Westward PGE plant. The spans are all between 2500-2800' with the shortest being the western one at Port Westward</p> <p>Troutdale Crossing: Our response</p> <p>BPA is proposing a 325' tower built on a small island in the middle of the Columbia River. BPA has determined that the island is too small and the foundations for the new tower will have to be piled into the riverbed. BPA has no information on the depth to bedrock or the geology of the bedrock.</p> <p>A tower in the middle of a river with limited or no access under adverse conditions may violate the WECC/NERC reliability standards in case emergency repairs are needed.</p>

- 14715-18 BPA can design tall towers. The taller the tower, the more unique it is, the more susceptible it is to being hit by aircraft, and the longer the outage would need to be to replace the tower.

The routes to Pearl west of Longview would require a new Columbia River Crossing where none exists today. They would also require extra tall river crossing towers that would need to have lights, where none exist today. Considering the river crossing and the approach paths north and south of the river, the best route included using an island that is managed for wildlife habitat. Clearing for new river crossings would likely have greater impact on wildlife than using an existing utility corridor.

BPA proposes to use its existing right-of-way on Lone Reef (island) that has exposed bedrock. The two existing 230-kV single-circuit towers would be removed and replaced with a double-circuit 230-kV tower, making room for the new 500-kV single-circuit tower. BPA has conducted geotechnical studies to inform the foundation designs. The island towers would not violate any WECC/NERC reliability standards. BPA would work with the FAA to determine if lights or marker balls are required. The Columbia River utility corridor being considered contains several utility lines and crosses in an industrial area both north and south of the river. The river crossing can be seen from some viewpoints and not from others.

14715-18	<p>If BPA opts to forgo the island, the span would be 2300' and require towers taller than the proposed 325' tower.</p> <p>Special markings, balls and strobes are mandatory for all towers over 200'.</p> <p>The aircraft risk here is much higher as it is in close proximity of Troutdale Airport.</p> <p>Reason for choosing Camas is that the towers won't be seen from the road – not true.</p>
14715-19	<p>Our response</p> <p>If Oregon, why a river crossing at all?</p> <p>If an Oregon option were to be chosen, there is no electrical reason why there even needs to be a Castle Rock substation. What BPA is planning to do at the Castle Rock Switchyard is to tap into the Napavine-Allston line. This can be done at the Allston substation before heading west and south to Pearl.</p> <p>We are not exactly sure why, but believe BPA wants to mitigate a double line fault (common mode outage) at the Longview crossing. This crossing has had no issues since the lines were built 30-40 years ago, so why would there be a problem now? If this is a new retroactive WECC reliability requirement, then why is this not a concern for all of the other BPA lines that cross rivers in close proximity?</p>
14715-20	<p>#15</p> <p>Complications due to existing 500-kilovolt lines</p> <p>Any new Oregon route to Wilsonville would cross or parallel one or more existing 500-kilovolt lines. To do so would create vulnerability to the Northwest's lines. A failure of parallel lines could compromise two critical backbones at once. Regulatory standards establish lower limits for lines or paths in these situations to keep the system within safe operating levels. BPA and other transmission owners could not make full use of their lines and could force us to propose even more new lines to meet regional power needs. The routes to Troutdale avoid this situation.</p> <p>Our response</p> <p>There is only one continuous 500KV line anywhere close to where the new line would be built in Oregon and that is the Allston-Keeler-Pearl line.</p> <p>Reliability standards are met when parallel lines are at least 1,500-2,000' apart.</p> <p>Unlikely a 500KV line cross will occur, if one is necessary, the lines can be uncrossed by re-terminating. There are many cases where BPA 500KV lines cross lower voltage lines.</p> <p>BPA is planning to re-terminate at both Troutdale and Paul substations.</p> <p>Reliability standards have a minimum distance waiver for the first five spans coming in/out of a substation.</p>

- 14715-19 Please see the response to Comment 14715-5.
- 14715-20 Proximity of the new line to existing lines is one of the many things that need to be taken into consideration, especially where the effect requires a possible de-rating of the new line or placement could affect the reliability of the system. Some situations are regulatory driven, others are intuitive in assessing the overall reliability of the system. As the aging transmission system reaches its capacity, it becomes more important to consider these issues when routing new lines so that the maximum benefit of building a new line can be realized.

14715-20	<p>Minimum distance waivers can also be granted for other reasons as well – such as going over a mountain pass or avoiding sensitive areas (human or environmental).</p> <p>BPA says that parallel lines need to be de-rated and they don't get the full use, but it is ok to run the 500KV in the same corridor (9 and 25) as the 230KV Ross-Lexington line. (We have asked for this to be mitigated, but even after filing a FOIA, no data has been released.</p> <p>BPA's plans show they intend to cross the new line with the existing 230KV line on Segment 40.</p>
	<p>#16</p> <p>Sherwood area line rebuilding</p> <p>"Extensive and complex line rebuilding will have to done in the Sherwood area if routes are selected".</p> <p>We have asked for details under a FOIA , but to date BPA has yet to release any specific data.</p> <p>Our response</p> <p>BPA will have to rebuild the lines through most of the segments that currently have a right of way.</p> <p>All or parts of the following segments that have an existing right of way will need to be rebuilt to make enough space for the new line.</p> <p>No matter which segments are chosen, complex line rebuilding will be required.</p> <p>Oregon has options which do not require line rebuilding.</p>
14715-21	<p>The following segments require rebuilding</p> <p>9 Remove ~4 miles of an existing Cowlitz PUD 115KV line and towers.</p> <p>25 Between intersection Minnehaha/St. Johns and the Sifton substation .</p> <p>Replace the 85-110' towers with 110-140' towers.</p> <p>Between intersection NE 137th Ave/NE 59th St. and the Sifton substation.</p> <p>40 Replace one set of 60-80' towers with 180-200' double circuit towers.</p> <p>41 Replace the 90-120' towers with a 150-200' triple circuit towers.</p> <p>45 Replace the 90-120' towers with a 150-200' triple circuit towers.</p> <p>46 Replace one set of 60-80' towers with 180-200' double circuit towers.</p> <p>47 Replace one set of 60-80' towers with 180-200' double circuit towers.</p> <p>48 Replace one set of 60-80' towers with 180-200' double circuit towers.</p>

- 14715-21 BPA has identified the Central Alternative using Central Option 1 as its Preferred Alternative. BPA is proposing to place the new line next to rebuilt 230-V lines on existing right-of-way through the Camas/Washougal area. This does not have an adverse effect on system reliability as the existing 230-kV lines serve a different purpose (moving power east/west) than the purpose of the new 500-kV line (moving power north/south). There is no vacant right-of-way to Pearl, so either new right-of-way would need to be acquired and cleared, or rebuilding existing lines would need to occur. It is a congested and developed area.

-
- 49 Replace one set of 60-80' towers with 180-200' double circuit towers.
- 50 Between intersection SE Everett Road/SE 5th Ave and SE 283rd Ave.
- Replace the 90-120' towers with a 150-200' triple circuit towers.
- 14715-21 51 Replace one set of 60-80' towers with 180-200' double circuit towers.
- 52 Replace one set of 60-80' towers with 180-200' double circuit towers.
- Segments 41-49 rebuild includes the 500KV line. All others it makes space to put a new 120-150' tower for the 500KV line.
- 14715-22 Again, BPA needs to fully address all questions and provide us with a complete set of viable and believable answers to everything that is questioned above. If BPA cannot do so, then we fully expect them to start all over again and reopen scoping to include Oregon.

14715-22 Please see the responses to Comments 14715-5 through 14715-21.

14716

LINDA KAREN PALADENI

03/22/2013

Hello, My name is Linda Paladeni,

14716-1 I own a piece of property in North Clark Co. located at [address]. It is my understanding, after speaking with Mark Korseness, there is a small group of people in this area who are opposed to the proposed route and are submitting an alternative route.

14716-2 My property has been in the family for over 100 yrs. I own 11 acres. 10 acres which the house sits on and 1 acre on the north side of the road. I own this one acre piece, as it is my only water source for my property. There is a spring on this piece of my property which has been there for over 100 yrs and is grandfathered in. This alternative route would have a major impact on my one acre piece and my only water source. I feel this is a very valid environmental impact on my property. Thank you for your consideration. Linda Paladeni

- 14716-1 Please see the response to Comment 14097-1.
- 14716-2 Please see the response to Comment 14097-1. There would be no impact to the commenter's 1 acre piece nor her water source.

JAIME HERRERA BEUTLER
 3RD DISTRICT, SOUTHWEST WASHINGTON

COMMITTEE ON APPROPRIATIONS
 SUBCOMMITTEE ON TRANSPORTATION, HOUSING AND
 URBAN DEVELOPMENT, AND RELATED AGENCIES
 SUBCOMMITTEE ON INTERIOR, ENVIRONMENT, AND
 RELATED AGENCIES
 SUBCOMMITTEE ON FINANCIAL SERVICES AND
 GENERAL GOVERNMENT
 COMMITTEE ON SMALL BUSINESS



Congress of the United States
 House of Representatives
 Washington, DC 20515-1602

14717
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March 22, 2013

Bill Drummond
 Administrator
 Bonneville Power Administration
 905 NE 11th Avenue
 Portland, Oregon 97232

Dear Mr. Drummond,

14717-1 | I am writing to provide comment on the BPA I-5 Corridor Reinforcement Project. As you are well aware, it is the people of my Congressional District who will bear the burden of this project. My request is simple: do all you can to protect them and lessen any impacts to our counties, cities and private landowners along the route that will ultimately be chosen.

14717-2 | In keeping with your assurances that the agency will carefully review suggestions and changes for final route placement, I am attaching documentation from multiple stakeholders and land owners outlining changes that can reduce the effects of this project on private property and local municipalities. Significant effort and countless hours have been dedicated by volunteers and public employees alike in the development of these recommendations, and they are worthy of your serious consideration. It is my hope, and theirs that the BPA will implement as many of these changes as possible.

Few would argue that the continued provision of safe, affordable and reliable power is critical to the economic and societal well-being of our state, region and nation. It is equally true that we must balance this need with the concerns that are being raised as the details of this project emerge. Although I have received more suggestions than can be raised separately within this letter, I would like to highlight a few that have been provided by multiple stakeholder groups:

- 14717-3 | • The Draft Environmental Impact Statement does not evaluate the potential impacts of locating towers and service roads on known and documented landslide hazard areas in close proximity to existing gas pipelines. This omission is of great concern.
- 14717-4 | • Consider realignment of the “P Line” a short distance to the west within Department of Natural Resources land in order to reduce impacts to the Lacamas Creek watershed and private property. Maps and detailed instructions have been included for your reference.

14717-1 Thank you for providing comments from your stakeholders. Their letters have been processed and responded to separately as Comments 14514, 14593, 14642, 14677, 14714, 14731, 14793, 14800, 14801, 14807, 14839, 14852, 14855, and 14859.

14717-2 Specific issues highlighted in this letter are addressed below.

14717-3 Chapter 14, Geology and Soils, describes the site-specific geotechnical investigations that would be done at potential landslide-prone areas to evaluate the potential for landslides to occur. These investigations have not yet been performed, but with existing geologic information available and to the extent possible, towers and access roads have been sited to avoid potential landslide-prone areas. Once geotechnical investigations are identified and completed, the information would be used to adjust tower and road locations as needed to reduce the risk of landslides to the project, other utilities, and the public. We have included in Section 14.2.8 additional mitigation measures to develop a landslide monitoring plan.

Please see also the response to Comment 14665-40.

14717-4 Please see the response to Comment 14714-4.

Page Two
Drummond, BPA

- 14717-5
- Follow property lines along the inside edges of land parcels to fullest extent possible rather than bisecting an owner's property.
- 14717-6
- In order to protect private tree farmers and the lands and trees that they care for, move the lines and towers a few hundred feet within the boundaries of Department of Natural Resources land wherever possible. Example, Line 18/19 to Line 18/29: Maps have been included for your reference.
- 14717-7
- Due to the long-term growth cycles on private tree farms and the economic impacts that will be experienced, consider leasing rather than purchasing easements across these properties.
- 14717-8
- Protect stream crossings, water sources and riparian areas when considering the locations of the towers and lines. Examples of these critical areas include the Boody Creek and Lacamas Creek watersheds.
- 14717-9
- Consider natural alternatives to sprays when controlling vegetation around the towers and lines.
- 14717-10
- Consider underground placement of the towers along the State Route-14 Corridor.
- 14717-11
- Although I previously spoke with your predecessor and am aware of the agency's position on this issue, there is a wide and growing consensus within the community that the Pearl Line be reconsidered for this project. It is my hope that you will give thought to this request.
- 14717-12
- Thank you for your time and attention to this matter that is so vitally important to the people of Southwest Washington.

Sincerely,


Jaime Herrera Beutler
Member of Congress

Enclosures

CC: Colonel Bruce Estok, District Commander
US Army Corps of Engineers

2 of 116

- 14717-5 BPA siting engineers have worked with individual landowners to avoid bisecting properties where possible.
- 14717-6 Please see the response to Comment 14097-1. Through most of this area, BPA has been able to move the right-of-way farther onto WDNR land.
- 14717-7 BPA would need to acquire perpetual easements for this project, paying a one-time payment based on market value for these rights. The appraisal process considers the long-term impacts to the property when determining market value for the land rights being appraised.
- 14717-8 Considering the length of the line and being west of the Cascades, it is impossible to not cross waterbodies and riparian areas. To maintain safe operation of the line, all tall-growing vegetation would need to be removed. BPA recognizes the importance of these habitats and the values they provide to the natural and human environment. BPA is studying ways to maintain as much riparian habitat as possible.
- 14717-9 Section 17.2.2.2, Vegetation Maintenance, describes herbicide use within BPA's right-of-way. BPA includes both mechanical and biological methods of vegetation management in their vegetation management program.
- 14717-10 Please see the response to Comment 14283-1.
- 14717-11 Please see the response to Comment 14443-1.
- 14717-12 Thank you for your comments.

14718

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY, DIANA REQUA

03/23/2013

14718-1 Fair Market Value is not acceptable compensation to landowners for the loss of their land, loss of their viewshed, and loss of their investments in their properties. A lot of rural landowners purchased their land undeveloped and through blood, sweat, and tears making a home site where none was previously. We put in a tremendous amount of work ourselves clearing that land for garden spaces and orchards to supplement our pantry. None of this would be included in compensating us for the loss this project will cause to our home and land values. Fair Market Value would not be fair because there will be no way to prove our losses because there will be no comparable properties that sold land with a new 150 foot clearcut with 500 kV transmission towers and lines through our land. People keep saying use public land for this project, well, the existing BPA-owned right-of-way is public land because through most of the route the Federal Government owns the land. Use your existing right-of-way and do not destroy the livelihoods of so many impacted landowners on your preferred alternative.

14718-2

[Attached letter below]

March 10, 2013

To Whom It May Concern:

14718-3 I am writing this letter on behalf of the organization A Better Way for BPA. I would like to state an educated opinion on the issue of "Fair Market Value". It is my understanding that the BPA intends to offer this type of compensation to the land owners whose properties will be used for the purpose of the new power lines. I have been asked whether I believe that this is the correct way to compensate these property owners for the destruction of their land. Not only do I have grave concern about how this dollar amount would be calculated but I don't believe it is even possible to use this terminology under these circumstances. In my line of work, having been a full time real estate professional in Clark County for over 20 years, Fair Market Value can only exist between a seller who is ready, willing and under no duress and a buyer who is ready, willing, and under no duress. Since this has long been my understanding and use of the term Fair Market Value I do not see any way that the people who are being forced against their will to allow this use of their land could possibly be given Fair Market Value. I further explored the legal definition of Fair Market Value and found that in the United States Supreme Court decision, United States v. Cartwright, the decision states that "The fair market value is the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of the relevant facts." Again, I say this can not occur when these land owners are not willing and certainly under strong compulsion.

Sincerely,

Diana Requa, Managing Broker
Prudential Northwest Properties
[address]
[phone]
[email]

14718-1 Please see the response to Comment 14566-9.

14718-2 Comment noted.

14718-3 Please see the response to Comment 14566-9.

In the appraisal process, the comparables selected for the property affected by the project (subject) would reflect all the attributes of Fair Market Value. These sales, after analysis and comparison, would help the appraiser render an opinion of Fair Market Value for the subject property.

14719

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY, DIANA REQUA

03/23/2013

14719-1 | In no way would Fair Market Value make home and landowners complete by the TAKING of the land they have poured their blood, sweat, and tears into. Use the Public Federal land you already own rights to-The West Alternative.

[Attached letter below]

March 10, 2013

To Whom It May Concern:

14719-2 | I am writing this letter on behalf of the organization A Better Way for BPA. I would like to state an educated opinion on the issue of "Fair Market Value". It is my understanding that the BPA intends to offer this type of compensation to the land owners whose properties will be used for the purpose of the new power lines. I have been asked whether I believe that this is the correct way to compensate these property owners for the destruction of their land. Not only do I have grave concern about how this dollar amount would be calculated but I don't believe it is even possible to use this terminology under these circumstances. In my line of work, having been a full time real estate professional in Clark County for over 20 years, Fair Market Value can only exist between a seller who is ready, willing and under no duress and a buyer who is ready, willing, and under no duress. Since this has long been my understanding and use of the term Fair Market Value I do not see any way that the people who are being forced against their will to allow this use of their land could possibly be given Fair Market Value. I further explored the legal definition of Fair Market Value and found that in the United States Supreme Court decision, United States v. Cartwright, the decision states that "The fair market value is the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of the relevant facts." Again, I say this can not occur when these land owners are not willing and certainly under strong compulsion.

Sincerely,

Diana Requa, Managing Broker
Prudential Northwest Properties

[address]

[phone]

[email]

14719-1 Comment noted.

14719-2 Please see the response to Comment 14566-9.

In the appraisal process, the comparables selected for the property affected by the project (subject) would reflect all the attributes of Fair Market Value. These sales, after analysis and comparison, would help the appraiser render an opinion of Fair Market Value for the subject property.

From: noreply@bpa.gov
Sent: Saturday, March 23, 2013 9:06 AM
Subject: 14720: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
 Bonneville Power Administration

Name: Richard none van Dijk
Organization:
E-mail:
Phone:
Address:

USA

Please ADD me to the mailing list.

Comment:

- 14720-1 Seeing that BPA's state of the art database/comments cannot support simple formatted text, I have had to resubmit my comments about the lies and lame excuses BPA told about their reason for not studying any Oregon routes. As there have been problems with uploading attachments, I have for reference added the text below again. Formatted comments will hopefully be attached. BPA's hubris has to date failed to address their easily debunked implausible excuses used to back into the predetermined decision to take Oregon off the table.
- 14720-2 BPA needs to fully address all questions and provide us with a complete set of viable and believable answers to everything that is questioned below. If BPA cannot do so, then we fully expect them to start all over again and reopen scoping to include Oregon. OREGON NEEDS TO BE BACK ON THE TABLE The comments below chronicle the event that we believe took Oregon off the table before the I-5 project was released to the public. The following assumptions about why the Oregon option was taken off the table are made based on documentation we received from BPA under the Freedom of Information Act (FOIA). The I-5 Corridor Project has been on the books since ~2002 and has always shown several route options through both Oregon and Washington. This was still the case until mid 2009 when there was a change. This culminated in mid/late September when BPA created an Agency Decision Framework (ADF) with all the reasons why the Oregon option was not viable, and BPA went public with the Washington options only. We have not been able to find out the real reason why BPA is so adverse to building in Oregon, but you will see that the reasons given for not using Pearl are just as valid for not using the Troutdale routes. We believe BPA never intended to build in Oregon, but was nevertheless prepared to go through with the scoping process and writing the Draft
- 14720-3
- 14720-4

14720-1 The commenter's comments were originally received and coded as Comment 14715. Responses below refer back to responses prepared for Comment 14715.

14720-2 Please see the response to Comment 14715-1.

14720-3 Please see the response to Comment 14715-2.

14720-4 Please see the response to Comment 14715-3.

14720-4

Environmental Impact Statement (DEIS) with both Oregon and Washington options included, even though it would take an additional year or two. Why? Possibly because nobody would have any reason to complain or ask questions as the whole process would appear to be fair and equitable. Once the decision was made to go to Washington, it would be too late and BPA would build the line as they had originally envisioned – in Washington. Unfortunately for BPA, the Department of Energy (DOE) and Secretary Chu put pressure on them to cut corners and do what was necessary to get the line built quickly. Secretary Chu has made comments about how cumbersome the NEPA process is and that it must be streamlined. Administrator Wright gave the order to get the line moving and fast. This led to his signing off on the ADF. The ADF had the pros and cons of three alternatives: Oregon and Washington all the way through the DEIS; Oregon and Washington and then drop Oregon during scoping; or Washington only. The pros and cons listed in the ADF are very biased and led to a predetermined decision. A walk back in time 2009 Jan, 28 Senator Murray announces \$3.25B borrowing for BPA Feb, 19 BPA announces four new lines to be built using stimulus funds Jun, 3 Stephen Wright confirmed as BPA Administrator by Secretary Chu. Chu said in a statement Thursday that Wright has proven an adept leader, accelerating energy efficiency and renewable energy efforts in the Northwest to meet regional and national objectives. "I am very excited that he has picked up the charge to do that, and he has my full confidence," Chu said Jun 10 BPA's Liaison in Washington D.C. meets with Secretary Chu to update on the progress ARRA reporting issues. Secretary Chu wants to know if one of the BPA projects could be test pilot for an accelerated NEPA and having an EIS in less than a year Jun 11 Steven Wright sends an email to staff that he wants an action plan by noon on how to meet Secretary Chu's demands for an expedited schedule for this and other projects BPA is working on. Jun 15 Western Governors Association Meeting "Secretary Chu also indicated that several of the federal agencies under his watch, including WAPA and BPA, are not moving in a timely manner in facilitating funding opportunities for renewable energy and transmission development. Secretary Chu expressly requested that the Governors contact him directly if any of these agencies are taking actions that will deter private investment in renewable energy and related transmission projects so that he can address these potential impacts immediately." July 29 Memo Wright to Chu on how the accelerated schedule will be met. At this point we believe that BPA started working to take Oregon off the table in order to meet a schedule that is politically driven Sep 8 Mark Korseness emails to Gary Beck and Larry Bekkedahl that it was Troutdale only. Sep 10 Date on Version 6 of the ADF which is confirmed by BPA as being the final version, but not so. Sep 11 Driessen questions why option #3 needs to be included if the decision to drop Pearl had already been made. How flippantly home taking is addressed, then exaggerated, inflated before becoming a negative for Pearl. Lists the bad things about Pearl to add to the ADF. (The ADF final date predates this email) How the established Project Schedule is driving taking Pearl off the table and how money is being thrown at it. Sept 11-24 Lots of emails getting maps finalized for taking to the public Sep 17 Stephen Wright questions portions of the ADF as he was leaning toward taking the Oregon options through scoping and to then drop it. Sep 18 Mark Korseness responds clarifying the same arguments as in the FOIA and adds a few more. Sep 22 Stephen Wright asks for further clarification especially on option 3 and whether the west should be kept in case the east became problematic Sep 22 Mark Korsness responds with mostly NEPA and process issues and how they can move forward without the Pearl option. Sep 22 Email exchange between Stephen Wright and Hub Adams – Attorney. All text redacted under Exemption 5 Atty.-client privileges. Sep 23 Stephen Wright decides to drop Pearl based on info put in the ADF by his subordinates. Interesting to note that Mark Korseness had determined it was Troutdale only – this before Stephen Wright made the official decision. There are plenty of other emails that show that they are doing everything they can to meet a start build date of August 2012. The following lists BPA's stated reasons From the ADF for removing the Oregon options and our reasons why similar known issues would be faced on the Washington side: #1 All Pearl routing alternatives would require a new Columbia River crossing near Longview where there are no existing utilities crossings of the river. Our response There are no electrical reasons why the breaker ring needed to tap into the Napavine line could not be done in a new bay at the Allston substation. This obviates the river crossing and also a new substation. #2 All Pearl routing alternatives would require very tall towers (up to 450 foot) at the Columbia river crossing that would have lights and overhead ground wire marker balls Our response Any tower over 200' requires special markings etc. The Troutdale tower in the middle of the river is currently planned to be 325'. Not known whether it can be built in the middle of the river as the island is too small. Special pilings for the foundation

14720-5

14720-6

14720-7

14720-5 Please see the response to Comment 14715-4.

14720-6 Please see the response to Comment 14715-5.

14720-7 Please see the response to Comment 14715-6.

14720

14720-7 would need to be in bedrock. The geology has not confirmed what that would require. If the middle of the river cannot be used due to reliability concerns, then the towers would need to be even taller – approaching that of those as being too tall. #3 Two Pearl routing options would require new tower and right of way on wildlife refuge island or similarly managed Columbia River lands Our response The third one doesn't, it crosses where

14720-8 PGE's Port Westward generation plant is. BPA will claim they need options. There are no options for crossing at Camas, so why must there be an option at Longview? #4 To get to the Columbia River, all Pearl routing alternatives would need to go through some residential areas.. Our response Reviewed from Google earth, getting through Castle Rock, Vancouver and Camas would have a far greater impact to residential areas #5 All Pearl routing alternatives would go through either managed timber lands and/or high use farm/crop fields Our response All non populated routes in WA also go through managed timber lands. As to the crops, this would not be the first line that is built in the middle of a field full of say wheat, vegetables or the like. Would need to work with BLM, US Forest Service and Oregon state lands - could it be the same reason for avoiding Gifford Pinchot? #6 The most direct route to Pearl would either go through or near established wildlife areas or near or over private airstrips. Our response The two most direct routes to Troutdale were taken off for Communications (13) and Relics/Artifacts (11). #7 One round about route to Pearl would likely take no homes; however it is likely that a least one home and possibly ten homes may need to be taken depending on which route segment is taken. Our response Documents show that many of the segments BPA is proposing to use have the same problem. On many existing right of ways the center line of the tower will be at the minimum allowed 75' from the edge of the right of way – Outside conductor would be ~50' from edge of Right of way. #8 The estimated construction cost of a routing alternative in the Pearl corridor ranges from X to XX million depending on alignment, whereas the estimated construction cost of a Troutdale routing alternative ranges from Y to YY million depending on alignment, making the Troutdale plan Z million less expensive Our response The actual figures were redacted by BPA, but \$342Million has been mentioned many times for the Troutdale option and between \$15-69M more for the Pearl option. Note: BPA spends \$850Million per year every year to protect and restore fish and wildlife, but they refuse to consider a one-time expense to protect people. #9 Pearl alternatives do not offer a route on an existing Right of Way, whereas the Troutdale plan does Our response There is an existing right of way, which has the Allston-Keeler- Pearl 500KV line in it. For reliability reasons, it should not be used, but could. (Over 80% of BPAs lines run parallel and thus susceptible to a double line failure) BPA will nevertheless argue that it is ok to use an existing right of way which already has the Ross-Lexington 230KV line in it and is an integral part of the I-5 corridor. A double line outage in this corridor would be just as serious as a double 500KV line outage. Portions of the Section 368 energy corridor in Oregon could be used. In Washington, most the existing right of ways are in populated areas, would require widening of the easement and/or the expensive rebuilding of the existing lines using even taller towers. Going through Vancouver and Camas will require many of the existing lines to be rebuilt with taller towers (up to 200') #10 Pearl Plan studied with the Troutdale plan requires an additional year for NEPA. Our response Since line has been on the books since ~2002 why the rush now? Pressure from DOE and Sec. Chu wanting this line built now and fast. He has said that the NEPA process takes way too long. Wants an accelerated schedule. #11 Pearl plan requires putting twice as many people's lives on hold in regards to property improvements, value, sales, ownership plans, etc Our response Not true. It is the other way around - Troutdale plan puts twice as many people's lives on hold. WA has 11,600 parcels and 7,750 landowners. Oregon has 5,900 parcels and 3,100 landowners #12 Pearl plan requires involving twice as many County and City governments. Our response Why does it matter how many agencies there are, BPA does not working closely with them anyway. It is more like telling them we are BPA and we do what we want. New/updated reasons for dropping Oregon that coincide with the August map release. #13 Pearl Substation Constraints "BPA's Pearl Substation in Wilsonville, Ore., is surrounded by industrial buildings with no room for expansion. The significant challenges in and around the substation and the existing 500KV line would be more extensive than those BPA is proposing at the Troutdale Substation. Fortunately, there is room at Troutdale for expansion near the existing substation". Our response Pearl: BPA already own 24+ acres of land to the west of Pearl which would double the size of the substation. When questioned on that, they said that it is not usable because it is used for drainage, congested with existing towers and that a significant portion is on a long term lease to a transportation company. Troutdale: The area being considered for expansion is a wetland, owned by the Port of Portland and would need to be purchased (estimated value \$1M).

- 14720-8 Please see the response to Comment 14715-7.
- 14720-9 Please see the response to Comment 14715-8.
- 14720-10 Please see the response to Comment 14715-9.
- 14720-11 Please see the response to Comment 14715-10.
- 14720-12 Please see the response to Comment 14715-11.
- 14720-13 Please see the response to Comment 14715-12.
- 14720-14 Please see the response to Comment 14715-13.
- 14720-15 Please see the response to Comment 14715-4.
- 14720-16 Please see the response to Comment 14715-15.
- 14720-17 Please see the response to Comment 14715-16.
- 14720-18 Please see the response to Comment 14715-17.

- 14720-18 It is to the west of the existing Troutdale substation with a Pacific Power and PGE substation and a road in between. This area is even more congested and will require many lines to cross. Would also require the existing 500KV line be moved from the existing substation to the new one as that is where the switching will take place. The old and new substations will need to be linked with a 500KV line. #14 Columbia River Crossing at Longview “Crossing the Columbia River downstream of Longview presented a major engineering and environmental challenge. To provide sufficient clearance for marine traffic, this crossing would require special towers more than 400-feet tall, more than twice the height of standard towers and among the largest in North America. The new towers at this crossing would require highly visible special markings and strobe lights. The larger the towers, the more likely they are to pose risks to aircraft. Crossing the river there would also require building new towers on islands that are managed for wildlife, or may become, wildlife refuges. Crossing the Columbia River at Troutdale allows use of a narrower, existing river crossing”. The engineering challenge: Our response: The Northwest has built many of these massive towers in the days when the engineering challenges were solved on the drafting table and a slide rule. Today BPA is a world leader with state of the CAD computers and they say this is a challenge. Existing tall towers include: 8 at Longview with a span of 2900’, requires clearance for marine traffic. 4 at St Johns with a span of 3250-3800’, requires clearance for marine traffic. 2 at Crow Butte with a span of 4000, requires clearance for river traffic. 4 at Pasco with a span of 3250-3550’, requires clearance for river traffic. Longview Crossing: Our response There are three proposed crossings downstream from Longview. Only the eastern one is on an island and has potential wildlife impacts. The middle and western ones are not in refuges. The western route crosses at the Port Westward PGE plant. The spans are all between 2500-2800’ with the shortest being the western one at Port Westward Troutdale Crossing: Our response BPA is proposing a 325’ tower built on a small island in the middle of the Columbia River. BPA has determined that the island is too small and the foundations for the new tower will have to be piled into the riverbed. BPA has no information on the depth to bedrock or the geology of the bedrock. A tower in the middle of a river with limited or no access under adverse conditions may violate the WECC/NERC reliability standards in case emergency repairs are needed. If BPA opts to forgo the island, the span would be 2300’ and require towers taller than the proposed 325’ tower. Special markings, balls and strobes are mandatory for all towers over 200’. The aircraft risk here is much higher as it is in close proximity of Troutdale Airport. Reason for choosing Camas is that the towers won’t be seen from the road – not true. Our response If Oregon, why a river crossing at all? If an Oregon option were to be chosen, there is no electrical reason why there even needs to be a Castle Rock substation. What BPA is planning to do at the Castle Rock Switchyard is to tap into the Napavine-Allston line. This can be done at the Allston substation before heading west and south to Pearl. We are not exactly sure why, but believe BPA wants to mitigate a double line fault (common mode outage) at the Longview crossing. This crossing has had no issues since the lines were built 30-40 years ago, so why would there be a problem now? If this is a new retroactive WECC reliability requirement, then why is this not a concern for all of the other BPA lines that cross rivers in close proximity? #15 Complications due to existing 500-kilovolt lines Any new Oregon route to Wilsonville would cross or parallel one or more existing 500-kilovolt lines. To do so would create vulnerability to the Northwest’s lines. A failure of parallel lines could compromise two critical backbones at once. Regulatory standards establish lower limits for lines or paths in these situations to keep the system within safe operating levels. BPA and other transmission owners could not make full use of their lines and could force us to propose even more new lines to meet regional power needs. The routes to Troutdale avoid this situation. Our response There is only one continuous 500KV line anywhere close to where the new line would be built in Oregon and that is the Allston-Keeler-Pearl line. Reliability standards are met when parallel lines are at least 1,500-2,000’ apart. Unlikely a 500KV line cross will occur, if one is necessary, the lines can be uncrossed by re-terminating. There are many cases where BPA 500KV lines cross lower voltage lines. BPA is planning to re-terminate at both Troutdale and Paul substations. Reliability standards have a minimum distance waiver for the first five spans coming in/out of a substation. Minimum distance waivers can also be granted for other reasons as well – such as going over a mountain pass or avoiding sensitive areas (human or environmental). BPA says that parallel lines need to be de-rated and they don’t get the full use, but it is ok to run the 500KV in the same corridor (9 and 25) as the 230KV Ross-Lexington line. (We have asked for this to be mitigated, but even after filing a FOIA, no data has been released. BPA’s plans show they intend to cross the new line with the existing 230KV line on Segment 40. #16 Sherwood area line
- 14720-19
- 14720-20
- 14720-21
- 14720-22

14720-19 Please see the response to Comment 14715-18.

14720-20 Please see the response to Comment 14715-19.

14720-21 Please see the response to Comment 14715-20.

14720-22 Please see the response to Comment 14715-21.

14720

- rebuilding “Extensive and complex line rebuilding will have to done in the Sherwood area if routes are selected”. We have asked for details under a FOIA , but to date BPA has yet to release any specific data. Our response BPA will have to rebuild the lines through most of the segments that currently have a right of way. All or parts of the following segments that have an existing right of way will need to be rebuilt to make enough space for the new line. No matter which segments are chosen, complex line rebuilding will be required. Oregon has options which do not require line rebuilding. The following segments require rebuilding
- 14720-22 9 Remove –4 miles of an existing Cowlitz PUD 115KV line and towers. 25 Between intersection Minnehaha/St. Johns and the Sifton substation . Replace the 85-110’ towers with 110-140’ towers. Between intersection NE 137th Ave/NE 59th St. and the Sifton substation. 40 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 41 Replace the 90-120’ towers with a 150-200’ triple circuit towers. 45 Replace the 90-120’ towers with a 150-200’ triple circuit towers. 46 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 47 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 48 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 49 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 50 Between intersection SE Everett Road/SE 5th Ave and SE 283rd Ave. Replace the 90-120’ towers with a 150-200’ triple circuit towers. 51 Replace one set of 60-80’ towers with 180-200’ double circuit towers. 52 Replace one set of 60-80’ towers with 180-200’ double circuit towers. Segments 41-49 rebuild includes the 500KV line.
- 14720-23 All others it makes space to put a new 120-150’ tower for the 500KV line. Again, BPA needs to fully address all questions and provide us with a complete set of viable and believable answers to everything that is questioned above. If BPA cannot do so, then we fully expect them to start all over again and reopen scoping to include Oregon.

[Attachment](#)

14720-23 Please see the responses to Comments 14715-22.

14721

A BETTER WAY FOR BPA, PRUDENTIAL NORTHWEST PROPERTIES, CHERYL KAY BRANTLEY, DIANA REQUA
03/23/2013

14721-1 In today's economy with the jobless rate so high I find it curious that a governmental agency would
14721-2 decide this is the time to TAKE land from private landowners. Because of the economy, some of us have
struggled to keep our homes and land. We travel thousands of miles a year to get back and forth to
work (if we have a job). We sacrifice a lot to live in rural areas. Use the Federal public land you already
own along the West Alternative. Don't prey on the lives of the hard working rural landowners.

[Attached letter below]

March 10, 2013

To Whom It May Concern:

14721-3 I am writing on behalf of the organization A Better Way for BPA to address the issue of the "preferred
alternative" through the Fern Drive area of Amboy, WA. I have been a Realtor in Clark County for over
20 years and during that time I have had the opportunity to work very closely with many buyers and
sellers in the North Clark County area. It is a well known fact that some of the most affordable acreage
properties are along Fern Drive in Amboy. This is true because the distance and elevation make the
properties less accessible and therefore less desirable to most land purchasers. Because of this, these
14721-4 properties have become part of one of the few areas in Clark County that have viable options for people
who want to fulfill their dreams of owning private acreage and might not have otherwise been able to
afford to do so. When all the routes and options came out from the BPA way back in the beginning of
this process I don't think this group of landowners had the time or the money to organize and fight for
their route to be removed. The majority of people who live up there are busy working to make a living
and make their mortgage payments on their piece of the American Dream. They are not likely to be
attorneys or doctors or other high income producers. It is not the same as the demographic who so
14721-5 quickly organized a well funded fight when the first set of line options included many high dollar estates
through the Hockinson area of Clark County. If I recall correctly that segment was the first to be dropped
from consideration. It certainly seems unfair to wipe out the beauty and privacy of the hardworking
14721-6 folks on Fern Drive and take away what is likely to be their only option for living on private acreage in
Clark County. I am appreciative of the organization A Better Way for BPA and thank them for coming
alongside the residents of Fern Drive to bring your attention to their plight.

Sincerely,

Diana Requa

Managing Broker,
Prudential Northwest Properties

[email]

[phone]

14721-1 Comment noted.

14721-2 Comment noted.

14721-3 Comment noted.

14721-4 Comment noted. The reasons segments in the area referenced were eliminated from consideration is in Section 4.7.2.2, Castle Rock to Troutdale Route Segments.

14721-5 Comment noted.

14721-6 Comment noted.

14722

RICHARD VAN DIJK

03/23/2013

14722-1

Just like BPA to pinch pennies when it comes to designing a decent system to submit comments. Suggest that whoever designed this database go back to school and retake "Database Design 101". This I believe is now taught at the freshman level in high school. We have repeatedly requested that all comments are easy to search, for example: by date or simple shown in reverse order with the latest first. Currently to get to and see the last comment submitted one has to scroll through 30 plus pages of comment which must be reloaded for every fifth page. That repeated has fallen on deaf ears with both Luanna Grow and Mark Korseness and completely ignored. This is just another case of how well BPA has listened to the people over the last three years.

Now while submitting comments, I find that all formatting including simple things like returns, tabs and paragraphs etc. are stripped and what you end up with is just a bunch of text that runs on forever.....Have fun trying to decipher unformatted comments.

- 14722-1 Comment noted. BPA now displays comments with the most recent appearing first in the list. The displayed text also includes paragraph formatting.

14723

From: noreply@bpa.gov
Sent: Saturday, March 23, 2013 9:57 AM
Subject: 14723: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
 Bonneville Power Administration

Name: Cheryl K Brantley
Organization: A Better Way for BPA Dole Valley Landowners Coalition Friends of Green Mountain Tum Tum Mt Area Landowners Coalition
E-mail:
Phone:
Address:

Group type: Special interest group

Please ADD me to the mailing list.

Comment:

- 14723-1 Public land for public use. To cause the least damage to the environment and preventing the destruction of the land and homesites of so many private landowners, BPA should double- or triple-circuit the towers along the public and federally owned existing transmission corridor (West Alternative). Using any other alternative in SW Washington would equal the largest clearcut in Clark and Cowlitz Counties in over 70 years. Pearl Alternatives
- 14723-2 should be studied as viable alternatives to this project. Build the project where the greatest load is needed in either Oregon or along the West Alternative. Most of the people in the rural areas do not use air conditioners,
- 14723-3 we don't need them because we use our trees to shade our properties (the trees you threaten to cut down for this project).

[Attachment](#)

- 14723-1 Please see the response to Comment 14460-1.
- 14723-2 Please see the response to Comment 14443-1 regarding the elimination of potential routes in Oregon from detailed study in the EIS.
- 14723-3 Comment noted.



14723

March 23, 2013

Bill Drummond, Administrator
 Bonneville Power Administration
 I-5 Corridor Reinforcement Project
 PO Box 9250
 Portland, Oregon 97207

RE: Double-circuit towers on wetlands and Oregon alternatives

Mr. Drummond:

14723-4 We are writing you today because we believe Bonneville Power Administration (BPA) did not provide a full range of alternatives, including complete and substantive analyses both quantitatively and qualitatively as required by law in any Environmental Impact Statement.

Double-circuit towers not studied

Under a Freedom of Information Act (FOIA) request to BPA asking for studies on double-circuit towers on wetlands along its West alternative (BPA-owned existing right-of-way), we received a response stating there were "no documents responsive to our request."

In 2009 we were told by BPA that putting towers side-by-side along their West alternative would be a reliability problem. They told us using their West alternative would be putting all their eggs in one basket if an airplane hit the lines or if there were a terrorist attack.

14723-5 On August 18, 2011, we received a response to several questions from Maryam Asgharian, our BPA contact person for this project. One question we asked was "Has there ever been a tower collapse or line failure along their existing easement (West alternative). Her response was "*We have not seen a tower collapse along this line. We have seen insulators fail or be vandalized. If this occurs, it would likely be along one span (between two towers), rather than the whole line. Once we are aware of an issue like this we can repair it within hours.*"

There is clearly not much of a reliability problem based on the 70-year history of this transmission corridor.

Using BPA's West alternative would save 74 million dollars by BPA's estimate. This would also minimize the impact to the environment. Double circuiting through wetlands would result in zero long-term net loss of wetlands. BPA's new double-circuit design reduces the perceived health

14723-4 Please see the response to Comment 14596-1.

14723-5 Please see the response to Comment 14460-1.



14723

risks, as found on BPA's web site¹ and in their Draft Environmental Impact Statement² (DEIS) for the I-5 Corridor Reinforcement Project.

BPA's new double-circuit tower design

14723-5

- Uses fewer towers: *"4 per mile in some places"*
- Costs less: *"saves BPA an average of \$18,000 to \$270,000 per tower"*
- Uses less right-of-way and creates less Electromagnetic Field levels: as noted on page 3-2, section 3.2.1 Tower Types in the DEIS.

Double circuiting for the entire right-of-way would place towers on the center of the right-of-way instead of near the edges, which would increase the distance from homes, businesses, and schools, would use half as many towers and would not require removal of as much vegetation along the edge of the existing corridor.

Pearl Alternatives (Oregon) not given a thorough Environmental Assessment as required under the National Environmental Policy Act.

For approximately ten years, the I-5 Corridor Reinforcement Project was a study of Oregon (Pearl) and Southwest Washington (Troutdale) alternatives. In 2009, just days before an announcement went to the public, BPA made the decision to not carry the Pearl alternatives through a full Environmental Assessment and made the decision to only study the Troutdale alternatives. In late 2009, our board submitted a FOIA request for the Agency Decision Framework (Version 6)³ discussing the prematurely dropped Pearl alternatives. From that documentation we learned that BPA planned to not let the Pearl alternatives "go public" for many reasons, most of which made little sense.

14723-6

Two examples are the following:

1. BPA states the Pearl alternatives would impact 3,100 landowners, whereas the Troutdale alternatives impacts 7,700 landowners. Since the Pearl alternatives would impact less than half the number of landowners, why did BPA drop it?
2. BPA states concerns regarding a new river crossing at the Columbia River in Longview, *"requiring very tall towers up to 450 feet tall."* This should not be a concern because the existing transmission towers crossing the Columbia River in Longview are **over** 450 feet tall.

¹ BPA Engineers Build A Better Tower, Saving Millions: <http://www.bpa.gov/news/newsroom/Pages/BPA-engineers-build-a-better-tower-saving-millions.aspx>

² <http://www.bpa.gov/Projects/Projects/I-5/Pages/Draft-EIS.aspx>

³ http://ahetterway4bpa.org/index.php?option=com_docman&task=cat_view&gid=92&Itemid=77

14723-6 Please see the response to Comment 14596-3.



14723

Both the Troutdale and Pearl alternatives had similar scenarios, as stated in the Agency Decision Framework (Version 6).

“All Pearl routing alternatives would need to go through some residential areas,” “would go through managed timber lands,” “would go near or through established wildlife areas and near or on private airstrips,”

However, in the decision to only study the Troutdale alternative BPA stated that *“The Pearl alternatives do not offer a route on existing right of way, whereas the Troutdale plan does.”*

14723-6

In that case why didn't BPA choose an existing right-of-way, the West alternative, for its preferred alternative? We think this is the most reasonable choice. If BPA persists in its decision to waste millions of dollars and hundreds of acres and invade, take, and devalue the properties of private landowners by building a new transmission corridor, then it should also be considering the Pearl alternatives to find the route least damaging to private property owners.

BPA wrote *“a new line in either corridor (Pearl or Troutdale) would fully meet our electrical needs,”* and *“proposing and thoroughly analyzing up to 88 segments (Pearl alternative and Troutdale alternative) will send a clear message that we considered all possible routes and have selected the very best alternative.”* We believe this is exactly what BPA should have done.

14723-7

The current Draft Environmental Impact Statement is flawed without a full range of alternatives included. To provide a full range of reasonable alternatives, BPA should perform a complete environmental review and analysis of the Pearl alternatives and double-circuit towers on wetlands along the West alternative.

14723-8

The Army Corps of Engineers must issue a permit for this project. BPA has only requested to permit one alternative, the Central Alternative, Option 1. Since BPA chose the Troutdale alternatives over the Pearl alternatives because Troutdale has an existing right-of-way, we demand that BPA requests a permit from the Army Corps of Engineers for its existing right-of-way, the West Alternative, using double- or triple-circuit towers through wetlands or for the entire length of the project.

14723-9

We are asking that Bonneville Power Administration ensures all alternatives, including double circuit towers and Pearl alternatives are given a complete and thorough analysis, both quantitatively and qualitatively as required by law in any environmental impact statement.

Sincerely,

The Board of A Better Way for BPA

14723-7 Please see the response to Comment 14596-4.

14723-8 Please see the response to Comment 14596-5.

14723-9 Please see the response to Comment 14596-4.

14724

Comments to BPA

***IMPACT OF BPA'S I-5 CORRIDOR
LINE SEGMENTS 18 AND 28
ON THE WITTER/REVESZ FAMILY
TREE FARMS***

MARCH 2013

Prepared by

Patricia Lee Witter

Jane Revesz

Peter T. Revesz

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Bonneville Power Administration
I-5 Corridor Reinforcement Project
PO Box 9250
Portland, OR 97207

March 20, 2013

To Whom it May Concern:

14724-1 In response to BPA's request for comments on the I-5 Corridor Reinforcement Project DEIS, we, the undersigned Small Forest Landowners write on behalf of our family of four generations in the tree farming business. It is with pride that we speak up in defense of not just our forest as a viable business that produces income for our- selves, but also as tax-paying contributors to Clark County's remarkable and unique value of renewable natural resources of forest, fish and wildlife. The paper that accompanies this letter presents a summary of the impacts of Line Segments 18 and 28 on our Witter/Revesz Family Tree Farms that we have been able to identify so far.

It is evident to us as we study the DEIS that BPA has not identified locations and impacts on the ground but has had several different companies contracted to write up topics from a variety of databases of which almost none, if any, have been verified in the field. It is quite frustrating to have been saddled with not only supposedly critiquing a 2000 page presentation that has not been coordinated from chapter to chapter but also we feel pushed hard to specifically defend our own property that is impacted. The time limit certainly has not been adequate for us to accomplish what we need to have done. It has totally taken over our time and efforts and has left us far behind in what we expected to be able to accomplish these past few months. Although many things in life can overwhelm individuals, it does seem unethical that a government agency can impose that much on people.

14724-2 Because BPA does not know on the ground, where they are asking to place towers or roads, the landowners must study what is really there to try to protect the future well-being of a wide variety of concerns and potential damage to the tree farms. Perhaps it is better to have the opportunity to say, "That is a stupid place to put a tower" than just having it constructed from these initial at-a-distance sitings. However, it seems total nonsense that unverified locations would actually be used in evaluating environmental impact and, then later having to change routings and tower locations. Later, this may call for after-the-fact revisions of the environmental impact. Since there has been almost no field verification would actually be used, how can it possibly be that alternatives were fairly and adequately compared? We do know that where we asked more than once that difficulties of both tower and access road locations we had identified on the "O" line be visited by specified BPA employees that there was no answer and no visit.

- 14724-1 Thank you for your comments. Specific comments are addressed below.
- 14724-2 BPA has reviewed the attached information and considered it along with field review and additional survey information. Please see the responses to Comments 14097-1 and 14119-2.

14724-2 The paper we include presents some of the detail that we have determined will need to be addressed if the I-5 Corridor Reinforcement Project continues to be pursued on the Central Alternative. Much more analysis, field verification, and use of experts will be essential to arrive at mutually satisfactory plans for the future.

Please take particular note of the summaries for each of our tree farms and the itemized summary of priority issues as follows:

14724-3 *Summarizing for our Dunegan Mountain Tree Farm, we feel that BPA's easement for Line Segment 18 should not be moved north to the property line of this tree farm because we are already sacrificing considerable revenue to an existing half-mile long and 175 foot wide power line easement plus its undefined Border Zone that bisects our tree farm, and to the preservation of Mature Forest wildlife habitat.*

14724-4 *Summarizing for our Boody Tree Farm bordering Line Segment 28 and marked by BPA to provide road access to at least 4 towers, our highest priority is the protection of the Boody Creek Watershed and the viability of our Tree Farms.*

Other priority issues are:

1. *Establish site for 28/12 and change access road location.*
2. *Establish site for 28/13 and change access road location.*
3. *Propose relocations of access roads to 28/11, 28/14, and 28/15*
4. *Arrange easements to entire proposed road system from public pavement to towers 28/11, 28/12, 28/13, 28/14, and 28/15 for Witter/Revesz.*
5. *Arrange a property line survey.*
6. *Safety concerns must be planned for, including plans to control trespass, intrusion, and vandalism. Gated year-round gravel roads are required. Ongoing review of the success of safety plans is to be part of the process.*
7. *Memoranda of agreement or the equivalent will be essential to assure coordination of all phases on a continuing basis on our property.*
8. *Obsolete one-time easement purchases for forest land must be replaced by realistic lease agreements reflecting future incomes foregone as well as ongoing and ad-hoc real costs incurred.*

We have thought seriously about each of the items included in that list and will not be dissuaded from pursuing each of them. We have learned the hard way that utilities' decision made without on the ground verification of facts and operational circumstances can result in very harmful activities on a rural tree farm. They caused us ongoing, recurring expenses, and continuing need for supervision and coordination much of which involved environmental damage. Also this has incurred security problems and loss of optimal forest management and timber growing.

14724-3 Please see the response to Comment 14097-1.

14724-4 Comment noted.

14724-5 Please see the responses to Comments 14097-1 and 14119-2. Specific issues are addressed below in responses to more detailed comments on these issues.

14724-6

You must be aware that the time to try to understand the possibilities of harm to our place has absolutely imposed a full-time endeavor for us. Although we are proud to be small forest landowners, in fact, we have been extremely hard hit by the proposed alternatives. The large, industrial and government land owners were given time, payment, consultation, and consideration of their preferences in decisions, whereas, we have been forced to spend our last years with our backs persistently against the wall trying to save what we can for the next generations without any assistance. It would seem that having to defend four different tree farms which is every tree farm of the Witter/Revesz Family Tree Farms is truly unfair and should not just be shrugged off as, "Oh, isn't that too bad."

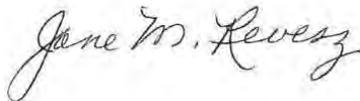
The process of planning such a public utility project should somehow not be able to do so much harm to a single family.

14724-7

BPA's I-5 Corridor Reinforcement Project's high-voltage power line that BPA is planning in our "neck of the woods" threatens with permanent impact – beyond the financial aspects. Unfortunately as is well known, trees and power lines are incompatible. We were and are, therefore, opposed to BPA's Central Alternative routing, however, we offer some helpful adjustments if it is imposed. The attached paper is our constructive review of our position on Bonneville Power Administration's chosen "Central" routing on or near our "Dunegan Mountain" and "Boody" Tree Farms.



Patricia Lee Witter



Jane M. Revesz and Peter T. Revesz

14724-6 Comment noted.

14724-7 Comment noted.

14724_Attachment

Comments to BPA

IMPACT OF BPA'S I-5 CORRIDOR

LINE SEGMENTS 18 AND 28

ON THE WITTER/REVE SZ FAMILY

TREE FARMS

MARCH 2013

Prepared by

Patricia Lee Witter

Jane Revesz

Peter T. Revesz

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I. OVERVIEW

14724-8 The Comments below address our family's forest properties impacted by the BPA I-5 Corridor Reinforcement Project shown on FIGURE 1, a BPA map of the Central Alternative. The map identifies two separate tree farms owned by our 4-generation tree farm family. The first tree farm, which we call "Dunegan Mountain Tree Farm", is located approximately 50 feet north of the proposed easement for Corridor **SEGMENT 18** in the vicinity of Tower 18/29 to Tower 18/31. The second family tree farm, which we call "Boody Tree Farm", borders the easement of **SEGMENT 28** in the vicinity of Tower 28/11 to Tower 28/15. We will first state our general position regarding preservation of each of these tree farms from unnecessary harm by SEGMENT 18 and/or 28, followed by more detailed comments and Figures regarding each tree farm in II. WITTER/REVESZ FAMILY TREE FARMS: A. DUNEGAN MOUNTAIN TREE FARM and B. BOODY TREE FARM .

14724-9 We have always tried to operate our tree farm holdings as a sustainable business while protecting the creeks, ponds, wetlands and native species on our land. This approach is becoming more difficult these days with fluctuating market conditions, a scarcity of saw mills, arbitrary vacating of shared-use access roads and increased regulation by various levels of government. Now BPA proposes to impact our family business in ways that will have not only new current costs to us but unforeseeable as well as foreseeable impacts throughout future years. Our 60 years of experience with PacifiCorp's Yale-Merwin easement on our Dunegan Mountain Tree Farm has taught us that big power companies can not be expected to treat Small Forest Landowners with common business ethics, fairness, honesty nor reciprocity. This forces us into continuous monitoring and supervision of their activities on our properties, and as necessary, legal action. We must be alert to poorly trained employees, inexperienced supervisors, unsupervised contractors and subcontractors. We incur heavy loss of time and costs on general damage prevention, remedies to damaged roads, left-open gates, ignored long-agreed mutual control and use of access; we found unsupervised operators sinking big machinery deep into our wetlands after being warned against operating in there; they spray our acres with powerful herbicides and widen their clearcuts outside their powerline easements.

14724-10

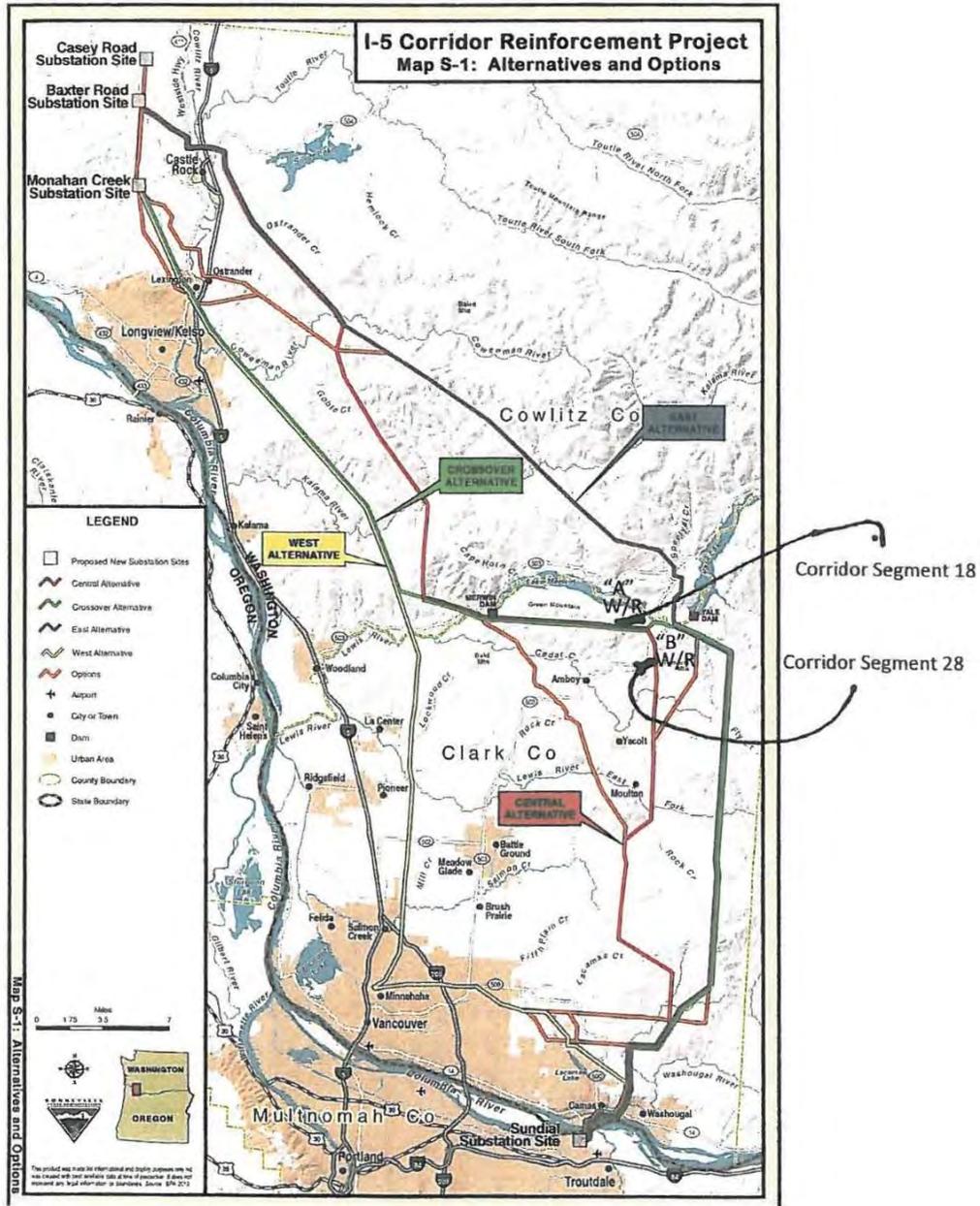
14724-11 Another serious concern for timber growers is the industry-wide recognized fact that a 150 foot wide ROW – 75 feet on each side of the center line to the edge of timber—is not an adequate operational distance from 180-200 foot tall timber. The Control Zone regulated by BPA on each side of it's actual 150-foot ROW easement through forested terrain is stated as an additional up-to 200 feet of timber land on which Danger Trees may not be grown. (See ATTACHMENT A, an excerpt from Kirk Naylor, PacifiCorp Comment to BPA,

- 14724-8 Comment noted.
- 14724-9 Please see the response to Comments 14674-1 and 14712-2.
- 14724-10 Comment noted.
- 14724-11 BPA is continuing to review this project's potential impact to properties that are under Forestry Operations to ensure that all potential impacts and areas of concern are considered and addressed. For new transmission line easements, BPA would acquire rights to cut vegetation outside the transmission line easement that presents a real or potential hazard to the transmission line's reliability. BPA would compensate landowners for the removal of danger trees identified in the future with the compensation based at the market value of the danger trees at the time the trees are identified. Criteria for these conditions would include but not be limited to vegetation exhibiting characteristics of failure such as trees on unstable slopes, isolated tree or tree fringes exposed to adverse winds, diseased trees or communities of diseased trees, damaged trees and defective trees. Otherwise, property owners would be unrestricted by BPA in the management of their land outside of the transmission line easement. BPA repairs or compensates for damages to access roads that result from its activities. BPA would work with the landowner to review possible placement of lockable gates to provide access only to the landowner and BPA.

14724_Attachment

Figure 1. BPA Map of Alternatives -- Central Alternative Selected

Witter & Revesz properties shown as W/R



March 2013

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- and ATTACHMENT B, a diagram introducing the concept of Wire Zone and Border Zone* corresponding to ROW and Control Zone, respectively.)
- Compensating the landowner outside the 150 foot ROW is an unresolved and often ignored issue. Since growing tall timber on rich Site Class 2 soil is the purpose of our business, this means that BPA may be putting us out of the forestry business along an up-to 550-foot wide swath -- (200 feet + 150 feet + 200 feet) of forestry – the only business we are legally allowed on our Forest Tier 1 properties. It is our understanding that this operational, safety and cost issue is currently being researched for a reasonable resolution.
- This leads us to an overriding concern: compensation to the owner of forestland which is impacted by a powerline and its access roads is far below his/her costs caused by the presence of the powerline. Decades of experience has taught us that the powerline company makes a low one-time payment for the ROW Wire Zone acreage on which timber trees can never again be grown. The powerline company makes no payment whatsoever when it physically and/or financially prevents the growing of timber in the Border Zone and added Access Road acreage. The land owner must continue to pay taxes on land in both Wire Zones and Border Zones on which timber will no longer be grown (but whose only use under current regulation is to grow timber). In our experience, the powerline company pays not a cent for road maintenance on our private roads but tears up our light-footprint forest roads with their heavy equipment and pays for damages only if forced to do so. We have lost months of use until one of our roads was finally rehabilitated. Presence of a powerline opens timberland to vandalism, intrusion, tree rustling and garbage dumping but all the associated costs fall on the landowner. In other words, the private timberland owner is forced to bear much of the cost of providing the public with “cheap” electric power. In fairness, the timberland owner should be able to lease his land (both Wire Zone and Border Zone) to the power company for an annual payment which includes the revenues from the timber-growing foregone. The power company should assume responsibility for access to their towers through construction or reconstruction and on-going maintenance of year-round roads that follow applicable state and federal forest road regulations and cooperate with the landowners in solving problems of vandalism, theft and misuse of the land, and in establishing practical procedures for scheduled and ad-hoc compensation.
- Forestry is a dynamic business. It is viable when it is managed to provide needed, flexible products and earns an appropriate return on investment. Taking of timber land with a one-time low payment is taking away investment and the return on it permanently; this is untenable and unfair. It may be easy to predict that the demand for electricity will rise but it is not easy for the tree farmer to forecast any of the following: market conditions of demand and supply (and therefore price) in a globalized timber market, climate change and forest fire conditions, energy costs, technology, security, legislation, regulation and tax policy. Even the long-time source of local pride Mt St Helens proved unpredictable.

14724-12 Comment noted.

14724-12 Managing under increasingly variable conditions calls for continued monitoring, tracking and coordination among all of us impacted by and responsible for managerial and operational problem-solving. For this, we need instruments of forward planning, coordination and mutual interaction, such as contracts, Memoranda Of Agreements, etc.

COMPENSATION OF THE SMALL FOREST LANDOWNER FOR THE COST OF HIGH-VOLTAGE HIGH-CAPACITY POWERLINES.

14724-13 As mentioned before, one-time easement terms are inadequate and impractical. The terms of BPA-Landowner interactions will, of necessity extend beyond the EIS process, the subsequent design, acquisition and implementation phases, and into the on-going modus operandi. BPA and DNR, Weyerhaeuser and others have spent several years and developed mutual reciprocal cost and other agreements prior to the DEIS. We, as “Small Businesses in Forest Landownership” must insist on our share of opportunities to adjust our management plans, do our analyses, consult with our experts, accountants, attorneys on an on-going basis, not to mention revising our family’s ownership plans and last wills and testaments to reflect the advent of BPA power lines. WE, THEREFORE, CONCLUDE THAT LEASE AGREEMENTS WITH CLAUSES FOR PERIODIC AND AD-HOC REVISIONS SHOULD BE USED FOR LANDOWNER COMPENSATION INSTEAD OF A ONE-TIME LUMPED-SUM PAYMENT FOR AN EASEMENT.

Following are brief summaries of our positions for our two tree farms.

14724-14 **A: DUNEGAN MOUNTAIN TREE FARM:** A summary of our position regarding our Dunegan Mountain Tree Farm is that the segment of Line 18 from Towers 18/29 to 18/31 should not be moved north toward our south property line because our tree farm is already harmed enough by being bisected by PacifiCorp’s Yale-Merwin powerline. Also, moving Line 18 north would put our forest stands along our south line further into the Control Zone for Line 18 which would destroy this tree farm’s long-term balance between sustainable forestry with small clear cuts, and maintenance of habitat corridors. This tree farm contains one of the few stands of Mature Forest shown on any BPA map so BPA’s easement should not encroach on this stand. (The map with the Mature Forest can be found in the BPA DEIS, Chapter 17, Map 17-1C.) Other local residents have already commented that the wetland conditions at the proposed site for Tower 18/28 and 18/29 would indicate that Line 18 should be moved further south in this area, not north toward our tree farm. Conclusion: Line 18 between Towers 18/29 and 18/31 should not be moved further north. More details to support this position are contained in section II.WITTER/REVESZ FAMILY TREE FARMS. A: DUNEGAN MOUNTAIN TREE FARM.

- 14724-13 If BPA decides to build this project, BPA would need to acquire perpetual easements, paying a one-time payment based on market value for these rights. The appraisal process considers the long-term impacts to the property when determining market value for the land rights being appraised.
- 14724-14 Please see the response to Comment 14097-1.

14724-15 **B: BOODY TREE FARM:** A brief summary of our position regarding the location of Towers 28/11 to 28/14 on or near our east property line is that these towers and their access roads must be placed so as to minimize harm to the important wetland corridor comprised of Boody Creek, the ponds on Boody Creek and the wetlands surrounding these bodies of water. EVEN IF THIS MEANS MOVING A TOWER ONTO OUR LAND, we will insist on protecting the integrity of this remarkable wetland corridor. We are also very concerned about the placement of access roads so as not to unnecessarily fragment our tree farm which, as with the Dunegan Mountain Tree Farm, we manage for a balance between sustained forestry and habitat preservation.

14724-16 In addition to Segment 28's crossing of Boody Creek, the Access Road system requires special attention. It has multiple crossings of Boody Creek's wetland area, recognized as a "High Quality wetland" on Map 16—2C, titled Wetland Quality, excerpted in Figure B2 of this paper.

More details to support this position are contained in section II. WITTER/REVESZ FAMILY TREE FARMS. B: BOODY TREE FARM.

14724-17 **READERS PLEASE NOTE: ADVICE TO SMALL FOREST LANDOWNERS WHO ARE IMPACTED BY POWERLINE COMPANIES AND THEIR HIGH CAPACITY TRANSMISSION LINES:** A valuable reference that we used in preparing these comments is a list of relevant considerations and issues in dealing with utility companies. It is the document approved by the Clark County Farm Forestry Association and the Cowlitz County Farm Forestry Association. The title is Considerations for Valuing Timber Land for Powerline Right-of-Way. It was submitted to the BPA comments section for the I-5 Corridor Reinforcement Project on July 30, 2011. This document is included here as ATTACHMENT C.

*Utility Vegetation Management Final Report: March 2004. FERC. U.S. Government. CN Utility Consulting, LLC.

14724-15 Please see the responses to Comments 14097-1 and 14119-2.

14724-16 Please see the response to Comment 14119-2.

14724-17 Comment noted.

II. WITTER/REVESZ FAMILY TREE FARMS.

A: DUNEGAN MOUNTAIN TREE FARM and Line 18 as it impacts the Witter/Revesz family tree farm comprising the SE quarter of Section 35 T6N R3E, WM in the vicinity of Towers 18/29, 18/30, and 18/31. (Please note: additional family names included in ownership of this tree farm: Brady, Von Hohenbalken and Kahn.)

14724-18 The attached aerial photo (Figure A1) shows the property line of our 160-acre tree farm in the SE quarter of Section 35 T6N R3E. The property boundaries are marked in red in Figure A1. The existing PacifiCorp Yale-Merwin transmission line corridor is clearly visible as it crosses our tree farm.

Our south property line is the ½ mile long line marked in red in Figure A1 between the large clearcut on our neighbor to the south (bare land in the foreground of the photo Figure A2) and our family's sustained-yield timber stands to the north of the clear cut. BPA's aerial map (Figure A3) shows that our south line is approximately 50-feet north of the north edge of the 150-foot BPA Line 18 easement. Again, the existing PacifiCorp Yale-Merwin transmission line corridor is clearly visible crossing our tree farm.

14724-19 Our position is that our 160-acre family tree farm has for 60 years sacrificed a great deal to the transmission of power in our region because the PacifiCorp Yale-Merwin transmission line already bisects the property as shown in Figures A1 and A2. To have a second powerline impacting our tree farm is an unfair additional burden on this well-managed small business.

As currently proposed, Line 18 of the Central Alternative would not locate the easement (Wire Zone) itself on our tree farm but would impact an estimated 7.6 acres of our timberland in the Border Zone.

14724-20 It could get worse. The neighboring owner of the clear cut area to our south in Figure A1 is HASLINGER PROP LLC AND FRANCAR LLC and the owners include Tom Hoesly. As of this writing, Tom Hoesly is requesting that the gap between the proposed easement and our shared property line be eliminated by moving the easement north to "coincide with the property line". If BPA does move the line thusly, the Border Zone would involve a further restriction of 4.5 acres in our ability to grow timber trees of the species, age and height that this growing site and our management plan call for, adding up to an estimated total of 12.1 acres of the Witter/Revesz property removed from forestry by Line 18.

14724-21 To reiterate the point that forestry is constrained well outside the boundaries of the actual easement, consider our experience with the PacifiCorp Yale-Merwin transmission line

14724-18 Comment noted.

14724-19 Comment noted.

14724-20 Please see the response to Comment 14097-1.

14724-21 Comment noted.

14724_Attachment

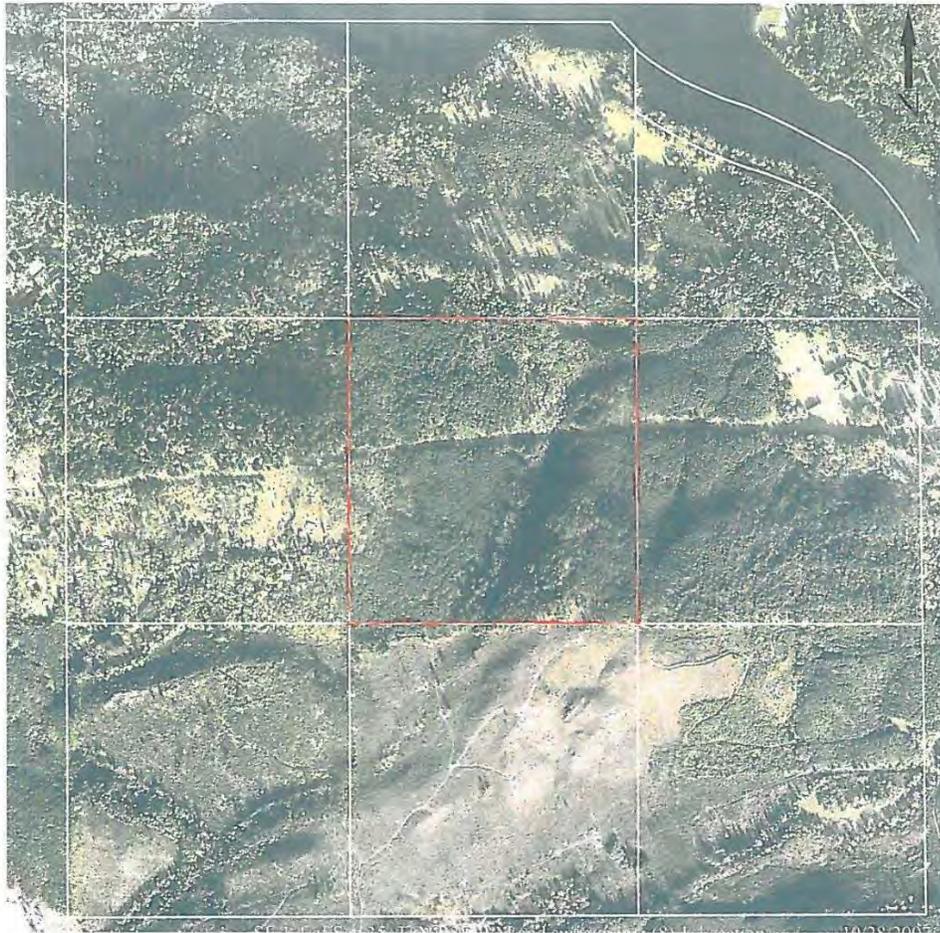


FIGURE A1

Witter and Revesz Property marked in Red, (SE Quarter of Sec 35 T6N R3E)

Note 1. BPA Line Segment 18 would lie parallel to the south red Property Line.

Note 2. Mature Forest stand along historic Klickitat Trail at center of Witter and Revesz property (red line).

Note 3. Witter and Revesz property shows long rotation moderate harvest Management.

14724_Attachment

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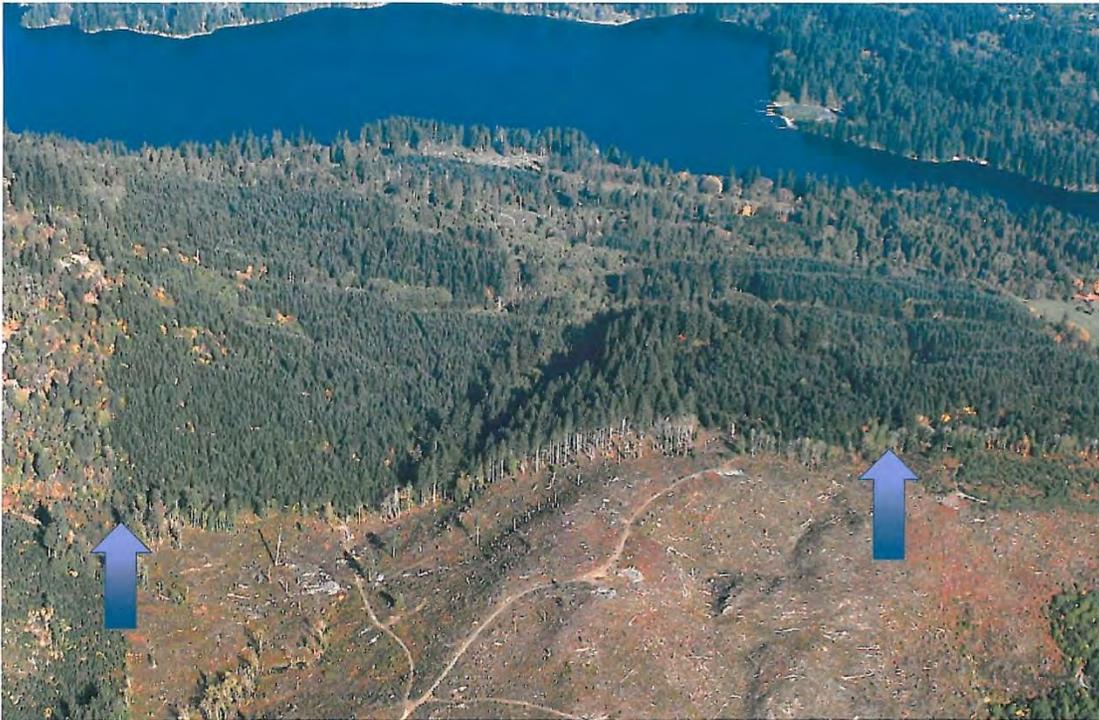


Figure A 2. Aerial photo of Witter/Revesz Family Dunegan Mountain Tree Farm. The ½ mile long south line of this tree farm is adjoined by the large clearcut in the foreground of the photo. This ½ mile property line is projected to be paralleled by the Central Alternative of the I-5 Reinforcement Project and extends between the two blue arrows in the photo. Note Mature Forest areas on the Witter/Revesz Family Tree Farm.

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Figure A 3. BPA projected Segment 18 with easement located approximately 50 feet south of the Witter/Revesz property shown outlined in red. Towers 18/29, 18/30, and 18/31 affect this Witter/Revesz tree farm. Tower 18/30 location is obscured in the photo by the number "18".

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14724-21 which removes a 175-foot wide easement Wire Zone over half a mile long (equaling 10.6 acres) from forestry as easement for the existing line (built in the early 1950's) and one potential additional line which may be built on that easement some day. PacifiCorp's Vegetation Control Department does indeed preclude cost-effective, long-rotation forestry on a Border Zone swath where "Danger Trees" are increasingly being removed. So the industry-recognized standard of 200 feet each side of the actual easement being controlled by the needs of power transmission is gradually being imposed on this tree farm. On average, a tree on our side of the PacifiCorp Wire Zone becomes a danger tree at age 27 in PacifiCorp's eyes, which is just when such Douglas firs enter their most productive period of growth. The Yale-Merwin transmission line takes up 10.6 acres of our forestland for Wire Zone and 24.4 acres for Border Zone for a total of 35.1 acres on this 160-acre tree farm that has already been removed from growing prime timber. Is it fair to impact additional acreage by moving BPA's Line 18 segment closer to, or onto, us?

Our south border, as illustrated in Figure A1, was subjected to tree blow-down when our neighbors did a massive clear-cut. Our forest stand along that border is now pretty well stabilized. If BPA moves the location of Line 18 further north in this Tower 18/29 – Tower 18/31 portion, our edge trees will be defined as Danger Trees and our sturdy edge stand will have to be harvested early rather than in accordance with its planned long rotation. (See Figure A3.)

14724-22 Even though we are a small business, we have maintained continuous wildlife corridors, small sized clearcuts and are growing long-rotation timber for harvests; in particular, we have respected the stand of mature timber that follows the pre-pioneer Klickitat Trail. This became the Protzman Road---the pioneer route to the Cresap Ferry, which serviced the logging operations north of the Lewis River. This mature timber corridor contains several identified Legacy Cedar Trees with ancient signs of cedar-bark stripping by local Native Americans. It also contains a Perennial Initiation Point where water flows north to the Lewis River and south to Chelatchie Prairie, and is home to various wildlife species of note such as salamanders, etc. General George McClellan is reported to have gone this way in 1853 while leading a survey party to find a railroad route across the Cascades. Chapter 17 of the DEIS describes this Mature Forest corridor and Vegetation Map 17 -1C in the DEIS shows it. Also the aerial photos in Figures A1 and A2 show this mature forest corridor. Moving Line 18 fifty feet north to our south property line would, forever, remove more of this Mature Forest habitat.

In summary, we feel that BPA's easement for Line 18 should not be moved north to the property line of this tree farm because we are already sacrificing considerable revenue to an existing 175 foot wide power line easement and its Border Zones, and to preserving Mature Forest wildlife habitat.

14724-22 Please see the response to Comment 14097-1.

B. BOODY TREE FARM and Line Segment 28 as it impacts the Witter/Revesz Family Boody Tree Farm, an L-shaped 160 acre tree farm in T5N R4E Section 18.

If the Central Alternative were to be used for the I-5 transmission line (a location to which we remain absolutely opposed) then we have to consider tower and access road locations and very heightened security concerns in regard to the Witter/Revesz Family Boody Tree Farm so that it can survive as a business, be able to remain a tree farm, and continue the healthy Boody Creek watershed.

In regard to the material proposed in the BPA DEIS for the I-5 Reinforcement Project, there are site specific changes and requirements that we consider essential for there to be any chance that this BPA I-5 Project does not cause ruin to our tree farm business.

14724-23 **TOWER AND TRANSMISSION LINE LOCATIONS:**

Our highest priority is to be given to protecting the Boody Creek Watershed and the viability of our Tree Farms.

CURRENT LOCATIONS PROPOSED BY BPA IN DEIS:

On the aerial photo from BPA of line segment 28, the transmission line and 150 foot ROW easements (wire zone) appear to be on the neighboring land to the west of us, owned by the Safranskis, with possible occasional intrusions onto the Witter/Revesz property. The 200 foot "border zone" to the east of the defined ROW (wire zone) would appear to be on Witter/Revesz from Tower 28/12 south to our southwest property corner. To the north of Tower 28/12 the transmission line would angle away from our property. (See Figure B1 for BPA proposed tower locations.) The Border Zone still impacts up to 200 feet of width along the west line of our property. Comments on specific towers follow below.

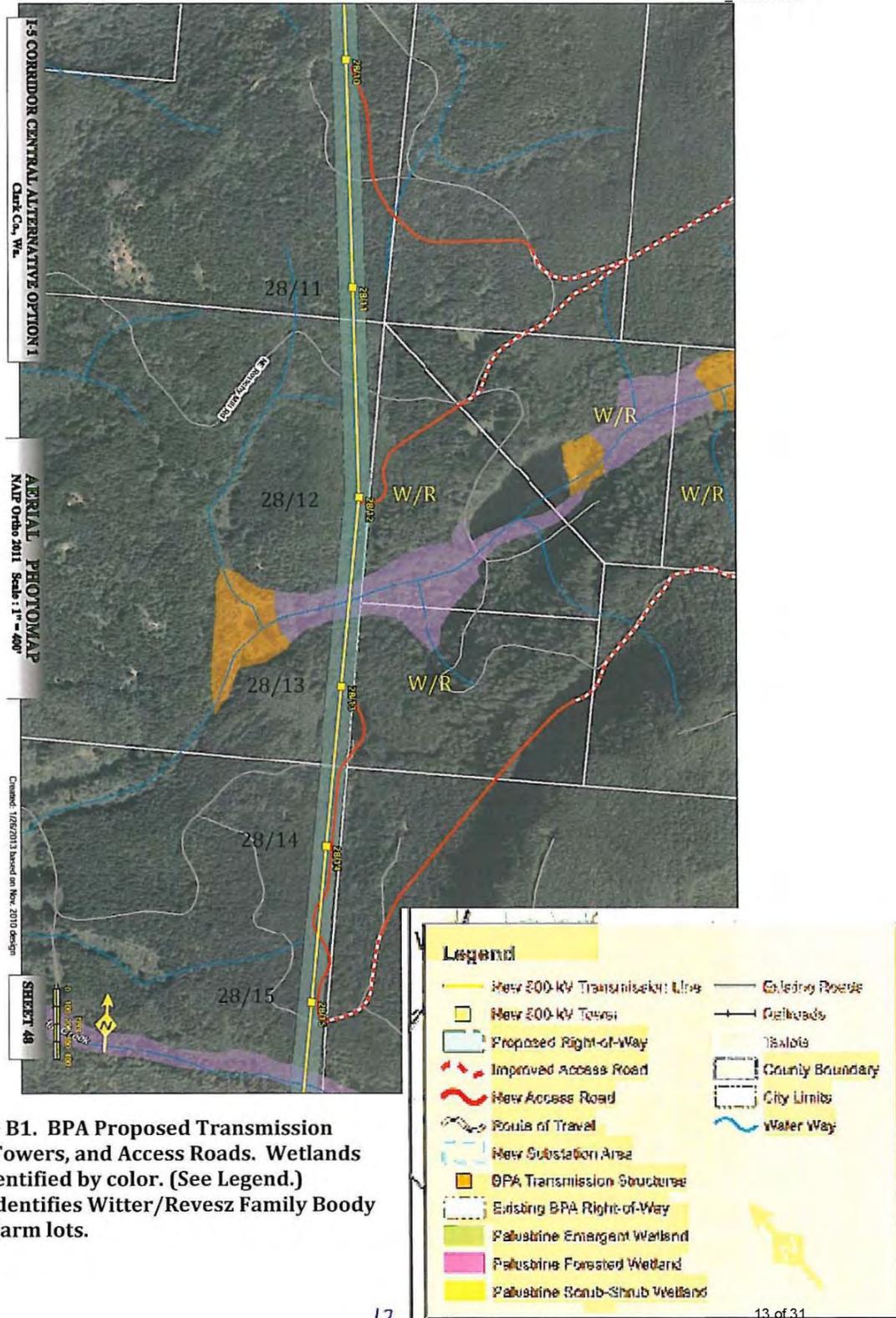
28/12—Current location approximately appropriate near top of hill. It is unclear whether this tower and wire zone are on the Safranski or the Witter/Revesz property.

14724-24 28/13—Current location as identified by BPA by GPS reading is untenable, unlikely. On the ground, it appears to be in a swale behind a ridge, and on a very steep slope to the west. It appears this tower is shown to be located on Safranski property.

28/11—Line and tower direction veers off to the west from 28/12 going north to Chelatchie Prairie. This tower is located on Safranski and appears to isolate a widening sliver of unmanageable timber from his major stands going to the north.

14724-23 Comment noted.

14724-24 Please see the responses to Comments 14097-1 and 14119-2.



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ADJUSTMENTS TO TOWERS AND TRANSMISSION LINES AS SUGGESTED BY WITTER/REVESZ:

- 28/12—Location to be fine-tuned on the ground. Road access to be changed.
- 28/13—Placement to be adjusted to be on the west end of top of ridge. This spot appears to possibly be on the Witter/Revesz side of the property line between Safranski and Witter/Revesz. This location is suggested because it more adequately protects the Boody Creek and wetland. This should be on a high point that can be reached by an access road without cutting into a steep slope or using an awkward siting or going to a lower elevation. Access road to be changed to avoid swale and steep slopes.
- 14724-24 28/11—This tower and its easement seem subject to change so that neighbor Safranski has less orphaned land. We request it not be moved onto our property. The access road has never been illustrated in the BPA materials for 28/11. It does not need to cross our land.
- 28/14 and 28/15—These towers are located on Weyerhaeuser land. Locations may remain where they are shown in the DEIS. Placement of access roads to these 2 towers through us needs to be changed since current proposed location is unnecessarily fragmenting to our property.
- Our suggestion for Tower 28/13 would result in taking some of our timberland for the tower location and easement. This suggestion is based on our field observations that this would reduce the negative impact of this project on the Boody Creek watershed and wetlands. Since the impact on the Creek is affected only by towers 28/12 and 28/13, towers 28/14 and 28/15 should remain as placed or at least not moved eastward to effect any of our tree farm. The heights and elevations of towers 28/12 and 28/13 have critical impact on the Boody Creek wetland. We recommend special attention to these towers.

**PROPOSED ACCESS ROAD LOCATIONS NEED CHANGES:
ENHANCED SECURITY ABSOLUTELY REQUIRED**

- 14724-25 The use and location of roads to this back country Shangri-la presents a complicated set of difficulties. At this time the BPA DEIS has major access roads proposed on our tree farm. The roads to towers 28/12, 28/13, 28/14 and 28/15 are shown to cross our property. (Refer to Figure B1.)
- On the map the entry to the road up the hill goes from public pavement at NE Healy Road in Chelatchie Prairie, passes through the Kravas property which is the old International Paper Mill grounds and from there crosses into the private property of Per Holten-Anderson, goes up the steep slope to the south, then onto the bench of

14724-25 Please see the response to Comment 14119-2.

14724-25 the Boody Creek watershed, still on Holten-Anderson, and eventually enters our property. This route is the access proposed by BPA to their transmission line. This road has been used over the decades for logging and access to various properties on the bench to the south of Chelatchie Prairie. The Witters used this road at times for tree farm management including for log hauling. It has not been kept in consistently good repair nor is it open for free public access. (See Figure B2.)

14724-26 The lack of easy road access to the Boody Creek watershed and the forested bench surrounding it has been a major protection to our place, the Holten-Anderson tree farm and the tree farm that is now owned by Safranski. Improving this road for BPA access will increase the need for protection from intrusion of this area that is unusually attractive to those that cruise the back country looking for lovely areas especially areas that are unsupervised. To prevent trespass, unwelcome intrusion, vandalism and to protect the Boody Creek watershed from abuse, we need security measures and road-use agreements. Road use agreements for us as small business timber owners must include access and use of the road system for forest management and timber operations. Evaluation of security measures with a defined method for enabling timely actions if needed must be included in planning.

After studying a number of maps and comparing BPA proposed road access to and through our place to the proposed tower sites, we find many sections of this road system that should be placed in revised locations. However, this will require both additional time on the ground for us and for us accompanied by experts and the loggers and foresters that have worked with us or our parents in the past so that excess roads and fragmentation of our property is avoided or at least minimized. We expect that if this project includes a road system on our property it will provide functioning logging roads for us and do as little damage to our tree farm as possible.

14724-27 As mentioned above in our preliminary suggestions for tower locations, the BPA proposed access roads to towers 28/11, 28/12, 28/13, and the spur to 28/14 and 28/15 are not well-placed. We expect to take the time to analyze and to avail ourselves of the use of experts to make this a well-planned project before any final decisions are made. We do have tentative suggestions for some of the access roads and we also know some of the currently proposed road locations are not acceptable. (See Figure B3.) For instance, the access road to 28/12 is shown going through our invasive weed patch. We and our parents before us have battled Giant/Japanese Knotweed for decades in this area. There are also additional invasive weeds in that location which is near the old homesite for the original homesteaders. Introducing a road through knotweed that goes to the clearcut corridor of the transmission line would establish an open route for the knotweed to get into the Boody Creek. Knotweed is a known extreme threat to the well-being of creeks and riparian areas if it gets a start there. Knotweed spreads extremely easily if established in a waterway and we have worked for years to avoid this happening. There is an already present old logging drag that goes to the approximate tower 28/12 site, does not enter the knotweed patch and would be more appropriate. However, this

14724-26 Please see the response to Comment 14119-2. No new access into the Boody Creek watershed is being proposed for this project. All roads needed for construction and future maintenance are existing, but would be improved.

If BPA decides to build this project, landowners whose land the project crosses will have an opportunity to discuss security measures and road use.

See also the response to Comment 14246-2 regarding unauthorized access.

14724-27 Please see the responses to Comments 14097-1 and 14119-2.

14724_Attachment

★★★



Figure B2. Road system from Chelatchie Prairie at northern blue star to Tower 28/15 on Weyerhaeuser timber land at southern blue star. Refer to Figure B1 for road and tower location details on this system. The red roads are proposed new roads to access proposed tower sites. We find the new road locations on us inappropriate and in need of relocation.

The dark green shows the location of wetlands of high quality and encompasses most of the length of Boody Creek. About 1/2 of the dark green area is on the Witter/Revesz Family Boody Tree Farm. (This figure is copied from BPA's DEIS, Chapter 16, Map 16-2c: Wetland Quality. The qualitative Wetland Rating given to Boody Creek of "High", colored dark green, is the highest rating given in this publication.)

The yellow line shows the proposed location of a portion of segment 28 of the transmission line of the Central Alternative of the I-5 Project that has been chosen as BPA's preferred alternative. The yellow transmission line crosses the valued wetlands of Boody Creek as illustrated. The selection of the siting location of the closest towers to the creek are of great concern from an ecological standpoint and is a priority of the Witter/Revesz family in order to retain the high quality health of this watershed.

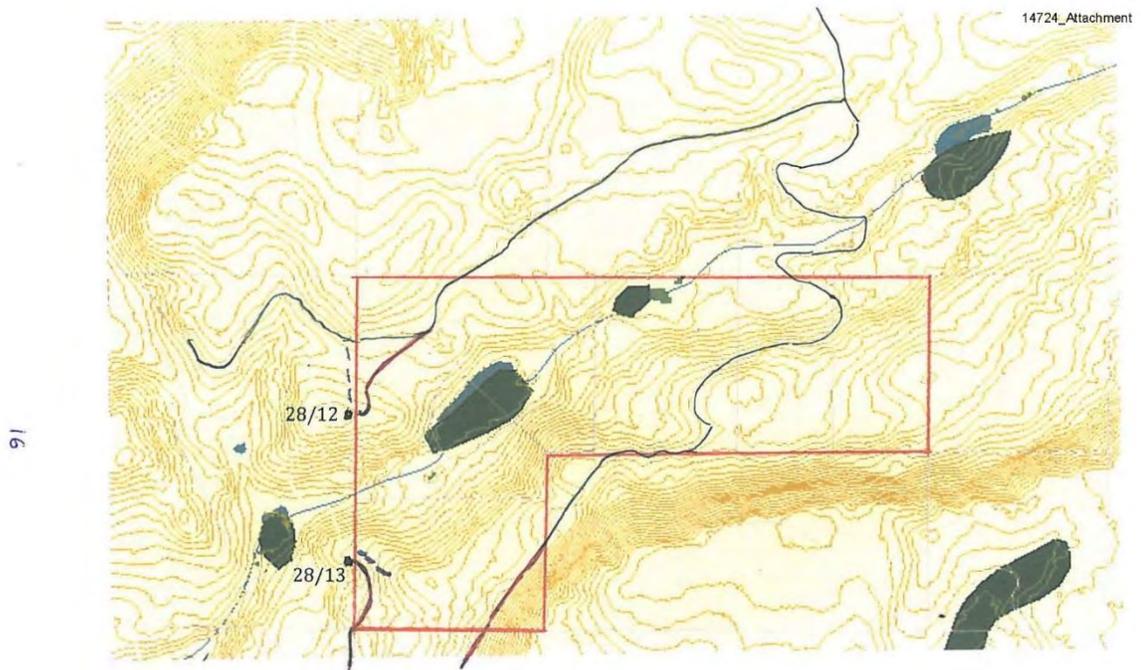


Figure B3. New Road Locations not found Acceptable by Witter/Revesz.

Relocations for Access Roads to Towers 28/12 and 28/13 and relocation of Tower 28/13 appears to be indicated. Roads shown in purple need analysis and relocation. Dashed lines are tentatively suggested relocations of access roads to Towers 28/12 and 28/13. Further analysis of connecting roads will be necessary if the project is built here.

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14724-27 logging drag, and the sites for 28/12 and 28/13 are close to the not well-defined property line between Witter/Revesz and Safranski. It is requested that BPA survey and mark this property line so that we as property owners can determine more precisely the ownerships with the locations of towers, the transmission line and access roads.

DESCRIPTION OF BOODY CREEK WATERSHED AND WETLAND: PRESENT AND NEEDED PROTECTION

The property is bisected diagonally by a highly functioning, fish-bearing creek of very high quality. Boody Creek Valley is illustrated in the accompanying aerial photo. (See Figure B4.) Boody Creek throughout its valley is characterized by wetlands and small ponds. (Boody Creek, wetlands and ponds are shown in Figures B4-9.) In addition, our tree farm contains the largest pond on this creek, known as Boody Pond for a century or more. This pond has been a longtime haven for fish and wildlife. (Figure B5 a and b.)

14724-28 The history of this pond and creek since 1946 includes continuing protection and enhancement by Leon and Winifred Witter and their descendants. A major project to stabilize the Boody Pond was undertaken by the Witters and completed in 1990. The results are illustrated showing the five culvert design of the outlet reinforcement. (See Figure B6). The fifth culvert is a portion of a fish ladder that is the route established as the entry and exit for fish and other aquatic organisms swimming between Boody Pond and downstream Boody Creek. This project was entirely paid for by the Witters under the approval of the WDFW and the design and supervision of construction by Fred Pickering. This fish ladder/pond stabilization project characterizes the emphasis on this tree farm of providing habitat of excellence for aquatic and terrestrial life.

14724-29 Boody Creek for its full length currently provides a very valuable watershed of ponds, wetlands, rapids, and waterholes that is productive of native cutthroat, native mussels (Western Pearlshell), water fowl, birds of prey, songbirds, native mammals and the aquatic organisms, reptiles and amphibians that are also native to western Washington. Some probable occurrence of coho and steelhead is recorded in various references.

14724-30 To continue this healthy creek condition, it is essential that the circumstances that have made this possible be sustained or be followed by conditions that will equally protect it. Unfortunately, this seems unlikely. The wetland where the transmission line is proposed to go threatens the health of the vegetation and the wetland. Removal of vegetation will damage the wetland and increase the likelihood of intrusion along the right-of-way. The specific site that is proposed for the Boody Creek crossing is illustrated in Figures B7 a and b and Figure B8. We are told it is

- 14724-28 The EIS summarizes distribution of special-status fish species in Chapter 19 Fish, 19.1 Special-Status Species. Segment 28 would cross Boody Creek at stream crossing 28-5. The EIS identifies this creek as an Unnamed Tributary to Cedar Creek. Table 19-1 and Map 19-1C indicate that this crossing is used by Lower Columbia steelhead. Table D-1 in Appendix K indicates production of adult steelhead is in the 40th percentile among all anadromous fish-bearing streams crossed by transmission line corridors. Boody Pond described in your comment is located about 700 ft upstream of the transmission line corridor. Boody Pond would not be impacted by the project.
- 14724-29 Please see the response to Comment 14480-3.
- 14724-30 Please see the responses to Comments 14097-1 and 14119-2. The transmission line and access roads are not proposed to cross Boody Pond but would still cross Boody Creek farther downstream. Because of the linear nature of a transmission line project, crossing streams is unavoidable. BPA continues to work with federal and state agencies to develop riparian mitigation for the unavoidable impacts to riparian areas. Mitigation measures that would be done as part of the project are listed in Table 3-2, Mitigation Measures Included as Part of the Project. Additional recommended mitigation measures for natural resources are included in Chapters 14 through 19. More mitigation is being developed through the Section 7 (Threatened and Endangered Species Act) and Section 404 (Clean Water Act) processes.

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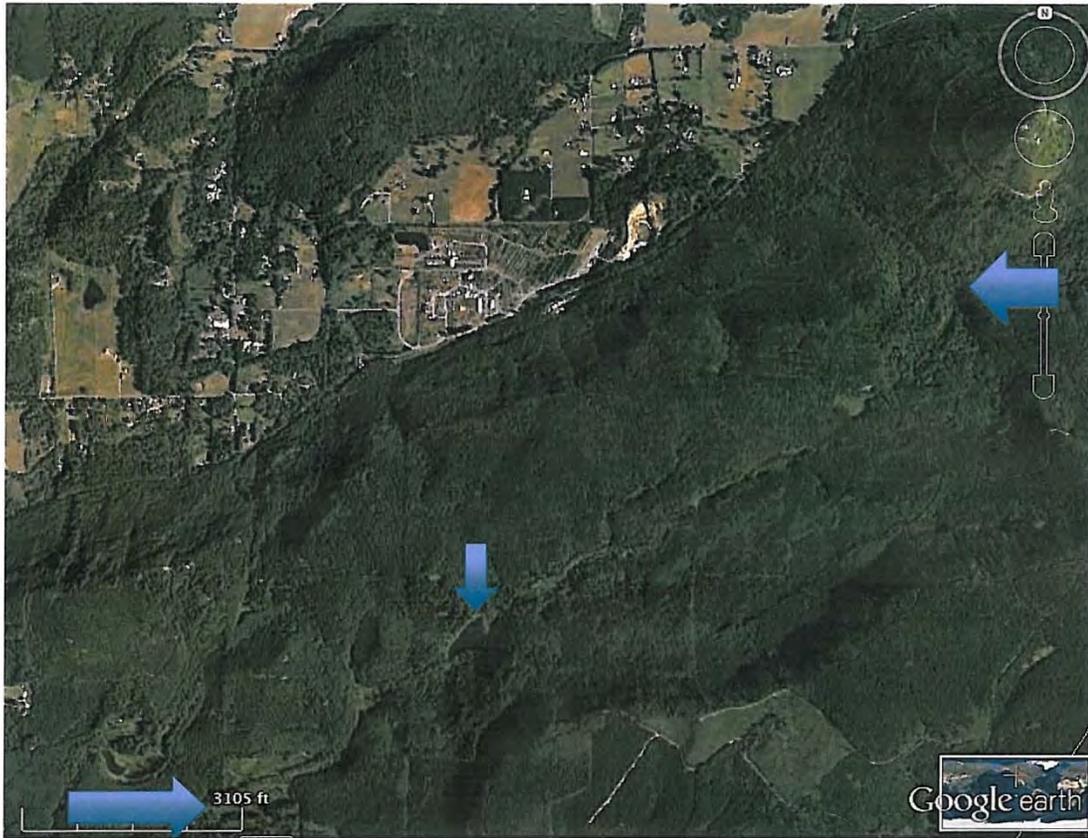


Figure B4. Boody Creek Valley. The course of the creek in this isolated valley goes between horizontal arrows. The vertical arrow points at Boody Pond on the Witter/Revesz Family Boody Tree Farm.

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14724_Attachment



Figure B5. Boody Pond.
a. A peaceful summer day—let's go fishing!
b. Bufflehead ducks in winter.



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Figure B6. The five culverts at the Boody Pond outlet. The Fish ladder goes from the culvert on the right at Pond level down to the creek level. This project stabilized the pond above that has probably been present for centuries.

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14724-30 likely the lovely old Western Red Cedar in the latter photo would have to be removed even if the towers are placed as high as is practical. Elevating the towers that are closest to this wetland would help retain the shade, vegetation and health of the Boody Creek and wetland and, hopefully, not interrupt the fish runs, the amphibians, and/or the mussel beds in this area.

14724-31 So far, what has made the superior condition possible: **it is a tree farm**, the tree farm is managed sustainably with small harvests but productive enough to be a family asset; it is a family tree farm. The philosophical position of—Tree Farms—The Best Use of the Land is characterized by the stewardship proposed and carried out on an ongoing basis on this family tree farm. This conveys the truth that a healthy forest not only produces fine timber, lumber, paper and pulp, and many other forest products, but also provides the conditions for the highest quality clean water, clean air, healthy habitat for fish and wildlife, and home for native vegetation. Carbon sequestration is now added to the list of positive contributions. With the underlying purpose of this family tree farm to promote continuing sustainable forestry stewardship, these positive results are heightened by our ownership.

What else has being a tree farm provided? The creek can be given as high a priority as the owners wish to provide. The riparian buffer is highly protected and restricted by Washington State law on small forest landowner tree farms. However, the most effective protection has been that the creek and pond have been protected by site-specific management to the extent that private land and tree farm purpose can protect it. The riparian buffer contains frequent large, live conifers as well as other shade and nutrient supplying vegetation. The large woody debris illustrated in Figure B9 has been retained since long before state regulation; this is what a pristine creek looks like.

14724-32 In addition, another protection is that **access has been limited** but in a way that has more or less balanced with the activities of intruders so that the Boody pond, the Boody watershed with its several other ponds and wetlands and our tree farm have been able to continue. However, this balance is fragile. It has been our Shangri-la but that same peaceful beauty of an isolated fish, duck, salamander, wildlife pond is an attraction that also contains the seeds of its own destruction if it becomes open to unrestrained entry by a much larger number of people. Gates may help at times. However, we have found on our back-country tree farms that gates only restrain the well-behaved so that frequently there is vandalism and breaking in through gates. There is no law-enforcement patrol or response for this type of crime so that typically the landowners supply whatever control is performed. Consequently, the increased access to intruders that will be provided by BPA's improved and/or new access roads and by the clearcut corridor under the transmission line threatens the integrity and health of our tree farm and the Boody Creek watershed.

14724-31 Please see the response to Comment 14724-30.

14724-32 Please see the responses to Comments 14724-30 and 14457-2.

14724_Attachment



Figure B. 7. a. WETLAND at approximate location of BPA transmission line Segment 28 at the “Crossing of Boody Creek” between Towers 28/12 and 28/13. (Glimpse of Boody Creek at center.)

b. This same wetland crossing area has several other small streams and wet spots and nurtures a large variety of aquatic and terrestrial native wildlife. See below.



14724_Attachment



B8 Big Western Red Cedar Tree that will be lost to the transmission line vegetation management. It measures 37 inches in diameter at breast height.

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B9. Naturally occurring Large Woody Debris and shade on fish-bearing Boody Creek in summer. Witter pond stabilization project is visible in background.

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SUMMARY OF BOODY TREE FARM REQUESTS TO BPA

THE FOLLOWING ARE TO BE ARRANGED THROUGH AGREEMENTS BETWEEN WITTER/REVEZS AND BPA ON HOW ACTIVITIES WILL BE ACCOMPLISHED:

Our highest priority is to be given to the protecting of the Boody Creek Watershed and the viability of our Tree Farms.

Other priority issues are:

14724-33

1. Establish site for 28/12 and change access road location.
2. Establish site for 28/13 and change access road location.
3. Propose relocations of access roads to 28/11, 28/14, and 28/15
4. Arrange easements to entire proposed road system from public pavement to towers 28/11, 28/12, 28/13, 28/14, and 28/15 for Witter/Revezs.
5. Arrange a property line survey.
6. Safety concerns must be planned for, including plans to control trespass, intrusion, and vandalism. Gated year-round gravel roads are required. Ongoing review of the success of safety plans is to be part of the process.
7. Memoranda of agreement or the equivalent will be essential to assure coordination of all phases on a continuing basis on our property.
8. Obsolete one-time easement purchases for forest land must be replaced by realistic lease agreements reflecting future incomes foregone as well as ongoing and ad-hoc real costs incurred.

14724-33 Please see the response to Comment 14724-5.

ATTACHMENT A

EXCERPT FROM COMMENT TO BPA

by Kirk Naylor, PacifiCorp, dated June 13, 2011

"On May 11, 2011, BPA and Mason, Bruce & Girard (MB&G, consultants to BPA) presented results of these studies to the TCC. During discussion the TCC was informed that the BPA proposed study area boundary on PacifiCorp Property was based on a 150-foot transmission right-of-way (ROW) plus up to 200 feet of potential additional clearing to a "backline" on each side of the ROW. This clearing-to-backline was represented to the TCC as BPA's standard practice to ensure all potential hazard trees within reach of the line would be removed. Vegetation would be allowed to re-grow in the in the 200-foot zone beyond either side of the ROW, as long as trees did not reach a height that would threaten the transmission line. This initially could result in a 550-foot wide clearing along the entire length of the selected transmission line route (not necessarily all on PacifiCorp WHMP lands)."

ATTACHMENT B

14724_Attachment

BSR A300 Part 7 IVM Revision Draft 1 version 1

Annex A: Wire Zone – Border Zone Concept (This annex is not part of the ANSI A300 Part 7 IVM standard)

The wire zone – border zone concept is a proven IVM method that ensures the reliability of electric supply lines while promoting stable, compatible plant communities and improved wildlife habitat on suitable electric utility rights-of-way. This method delineates the portion of the right-of-way beneath the conductors (wire zone) from the portion on either side (border zone), and prescribes different management strategies for each area. Annex A provides supplemental information about this method.

A-1 Annex A Glossary

A-1.1 Border zone: Portion of electric utility right-of-way on either side of the wire zone and extending to the outer edge of the established right-of-way, selectively managed to include a mix of compatible herbaceous and low-growing woody vegetation below a specified height.

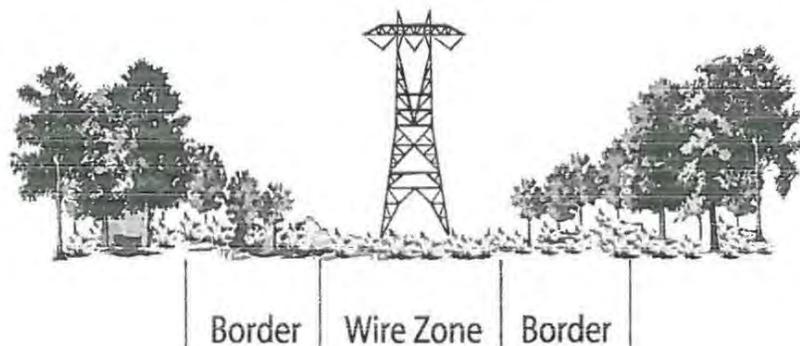
A-1.2 Wire zone: Portion of electric utility right-of-way directly beneath electric supply lines and extending outward to a utility-specified distance, managed to promote only low-growing, primarily herbaceous vegetation.

A-2 The wire zone – border zone method requires the use of separate management strategies for the wire zone and border zone on the same right-of-way, which may not be optimum for all sites. The method is especially useful in areas where ecological concerns, such as visual impact and wildlife diversity, are a consideration. When properly implemented, use of the wire zone – border zone method will not affect the reliability of utility facilities. The vegetation manager must determine the suitability of a particular site or right-of-way for management using the wire zone – border zone method.

During initial establishment, especially on rights-of-way that have not been regularly maintained, or contain minimal or no compatible vegetation, non-selective methods may be used; however, the effect of these methods on surrounding land owners and other stakeholders must be carefully considered prior to implementation.

A-3 In the border zone, incompatible vegetation is selectively controlled, and compatible vegetation that will not grow above a specified height is conserved. By retaining a greater variety of vegetation types, wildlife habitat is improved, and the visual impact of the right-of-way is softened.

Figure 1: Wire Zone – Border Zone



A-4 In the wire zone, woody stems, climbing vines or other vegetation that could impair access or harbor young trees may be controlled using selective or non-selective methods. Maintaining low-growing, primarily herbaceous cover in this area allows access to utility infrastructure for inspection, repair, and maintenance, and to inspect vegetation on and off the right-of-way. In addition, the wire zone is often ideal for wildlife species that prefer a meadow-like habitat.

A-5 Over the long term, the wire zone – border zone method increasingly makes use of cultural and biological controls to develop stable plant communities in each zone, thus minimizing the need for other IVM control methods. These plant

communities attract and aid in the establishment of stable wildlife populations, which in turn may further enhance biological controls. The wire zone – border zone method can be implemented in most areas; however, the need for additional control methods, as well as the species of flora and fauna present, will vary depending on local climate and site conditions.

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ATTACHMENT C

Considerations for Valuing Timber Land Taken for Powerline Right-of-Way

1. Initial Requirements:

- a. Pay for the bare land value - independent appraisal based for highest and best use. Land varies by soil productivity (site class), slope/aspect, annual precipitation, location from populated areas, etc.
- b. Pay for younger trees based on present worth of value at maturity (forester's appraisal).
- c. For mature timber pay based on the cruised value. Give at least one year notice so the landowner can log instead if they wish.
- d. Build and maintain roads to DNR standards so trucks and equipment can use them. If the DNR rules change, BPA needs to follow the new rules.
- e. Clearly mark the edges of the right-of-way.

Ongoing Requirements:

2. Lease option, if not sold for highest and best use. Pay an annual lease payment **for the lost opportunity to grow timber**. This would be on a per acre basis and based on the average growth rate of 700 bf/acre/year with a stumpage value of \$500/Mbf. This would be \$350/acre/year initially and would be adjusted for inflation based on the producer price index. The above is an example actual numbers are specific for each site in consultation with a forester.

Note: There are significant differences between the small timber owner and state or federal land and the large industrial timber owner regarding the value of timber. Thus, values from state, federal, or large industrial timber owners are not useful in valuing the timber for small timber owners. Two primary differences are that small timber owners may wait until the market price is attractive and may export their wood. However, the growth rate will be site and specie specific.

3. A number of other issues surface with power lines generally involving trespass. The BPA needs to put in adequate gates (refer to BPA documents on stockyard gates; this is a starting point depending upon trespass issues) and **maintain them**, let it be generally known that this is private land and trespassers will be prosecuted with the BPA paying these costs. Provide frequent signage indicating land is private and no trespassing allowed. A mutually agreed upon standard for managing and controlling the short and long-term impacts of unauthorized public use of the right-of-way needs to be determined.
4. There needs to be an agreed upon standard for roads including: inspection and maintenance schedules, reporting requirements, maintenance standards, and road construction, reconstruction, and abandonment standards as well as the cost sharing. Landslide potential for roads needs to be assessed. Road grades would vary depending on the land slide potential. Roads would be rocked where needed

for dust abatement, stability, load bearing and seasons of use. BPA has road design sheets that may be used in conjunction with DNR standards for building and maintaining roads.

5. The Access Roads required for each Power Line Tower – from a public road to the tower – need special, individual contracts between the BPA and the private landowners. These roads may be for exclusive BPA use only, or they may be shared with one or more landowners in a chain of land parcels. They may be shared with multiple ownerships on branched roads. Whatever the configuration of each road system, the specifics must be negotiated with all impacted owners. The issues include:
 - Mutual planning and coordination of road use,
 - Agreed-on responsibility for maintenance timing and quality control,
 - Assessment of damages – man-made,
 - Procedures for notifying all owners and users of road availability or blockage
 - Procedures for coordinating security – policing security gates, multiple locks and keys among owners and users, between owners, contractors, subcontractors and regulatory personnel (refer to BPA road design spec).
6. BPA needs to prevent any spreading of weeds during construction and afterwards. BPA needs to comply with all noxious weeds rules county, state, and federal. The BPA integrated pest management plan should be approved by the landowner.
7. Native wildlife and plants needs to continue to have good habitat. Perhaps low growing shrubs could be placed by streams to maintain reasonable water temperatures. A plan for promoting the growth of low growing, native plants needs to be agreed upon.
8. The term of the lease should be for the life of the powerline.
9. The lease is for a single use by the BPA and not for any other utility.
10. Compensation needs to be made for any other land that is taken out of timber production or encumbered because the location of the powerline (i.e. causes land to be inoperable or increases harvest costs) or additional BPA roads - a severance right-of-way.
11. Even if the adjacent land is not within the powerline right-of-way, its value will be reduced and an evaluation of the just compensation is necessary.
12. Any additional property taxes over the amount for timberland will be paid annually to the county by the BPA.
13. The agreement needs to be signed “under threat of condemnation for the public good.” Refer to IRS Publication 544 or an accountant for tax implications. Wording in our agreements “lawfully seized and possessed of the lands and premises aforesaid,”
14. BPA’s contractor assumes all risks of damage to the property or injury to the contractor in connection with construction and maintenance of the powerline. Landowner will not be liable for any claims.
15. Fire protection will be provided by the contractor during construction and construction will be suspended, if considered necessary. The landowner and BPA

- will determine a mutually agreeable fire prevention and suppression plan for both the construction phase and the operation and maintenance of the BPA powerline.
16. Any damage to agricultural land (fences, crops, irrigation) during construction, reconstruction, or maintenance of the lines shall be repaired or paid for by BPA.
 17. BPA needs to notify the landowner, whenever they will be coming on your land for maintenance. Agreement on the notification protocols for maintenance, repair and reconstruction activities.
 18. The owner and successors have the right to use the land for all purposes not inconsistent with the BPA's use. The owner has the right to freely cross and if possible, use the land for normal agricultural purposes. The owner may access timber on both sides of the powerline, pull logs underneath and use the roads to haul logs.
 19. If danger trees were removed outside of the right-of-way to protect transmission lines or the towers the landowner must be reimbursed for the trees based on their present worth of value at maturity.
 20. The value of the land for future purposes is being lost. Some examples are hunting leases, recreational uses, and carbon credits.
 21. Any construction permit with the BPA or its contractor needs to also include items listed in this outline such as use of roads, access, maintenance rock, pay for damages, and cash deposit. You don't need to accept their proposed construction permit.

¹Document approved by Clark County Farm Forestry Association and Cowlitz County Farm Forestry Association and submitted as comments to the BPA I-5 Corridor Reinforcement Project by Robert Zumstein, Chairman of the Farm Forestry Task Force, July 30, 2011.

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14725

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY, JANICE DAVIS, PAULA OVERHOLTZER, RAYMOND B RICHARDS

03/23/2013

14725-1 | It's unfortunate that BPA has listened to the people who chose to live near to your federally owned right-of-way instead of the people who would be most impacted by the TAKING of their land. It's unfortunate that the politicians in SW WA have listened to these same people who chose to live near an existing Federally-owned transmission corridor that is wide enough for additional towers and 500 kV lines.

14725-2 | Because of this, we were forced to write up what the people we fight for have said they would want if you indeed do choose to destroy the beautiful places they call home. We have listened closely to our members about what they would want should you choose to ram this project down their throats. Their requests are attached. We are not conceding to BPA or this unnecessary cheap governmental land grab. We will continue to stand alongside these landowners who have so much to lose. We demand you listen closely to them when you come in and TAKE one of their most prized possessions.

March 12, 2013

On behalf of all landowners impacted by Bonneville Power Administration, I-5 Corridor Reinforcement Project, we request that:

14725-3 | 1. The project must minimize the impact on private property by not bisecting private land.
2. The corridor must follow property lines, running along the inside edges of land parcels. The corridor should be sited so that no trees will be taken from the adjoining property owner's land.

14725-4 | 3. Wherever possible, the corridor must be sited on Department of Natural Resources land instead of private land.

14725-4 | 4. On any land parcels that share boundaries with Department of Natural Resources land, lines and towers must be moved into DNR land so not to impact adjacent private land. The corridor should be sited so that no trees will be taken from the adjoining property owner's land.

14725-5 | 5. Fish and wildlife habitat must be protected by following Washington State Forest Practices Act guidelines.

14725-6 | 6. Water sources, both above and below ground cannot be adversely affected.

14725-7 | 7. Property owners who lose real estate and property rights to this project must be paid full retail value.

14725-8 | 8. Owners of agricultural and forest land should be paid for any present and future losses they may incur.

14725-9 | 9. Loss of viewshed can have economic impact on property value and that loss must be fairly compensated.

- 14725-1 BPA has listened to and read all the comments received on the Draft EIS. We considered many factors when identifying BPA's Preferred Alternative. Please see BPA's issue brief at: <http://www.bpa.gov/Projects/Projects/I-5/Documents/BPA-I-5-Issue-Brief-Preferred-Alternative-Nov2012.pdf>. Please also see the response to Comment 14110-1.
- 14725-2 Between the Draft and Final EIS, BPA contacted landowners who could be directly affected by the Preferred Alternative and met with those willing to discuss project design and impacts. If BPA decides to build the project, more meetings would occur with landowners during the appraisal and easement purchase process.
- 14725-3 BPA has met with landowners along the Preferred Alternative to discuss ways to reduce potential impacts. Please see the responses to Comments 14097-1 and 14119-2.
- 14725-4 Please see the response to Comment 14725-3.
- 14725-5 Consistency with the Washington State Forest Practices Act is discussed in Chapter 28, Consistency with State Substantive Standards. BPA would try to meet the substantive requirements of the Act.
- 14725-6 Please see the responses to Comments 14160-1 and 14438-5.
- 14725-7 Please see the response to Comment 14566-9.
- 14725-8 Please see the response to Comment 14566-9.
- 14725-9 Please see the response to Comment 14566-9.

- 14725-10 | 10. BPA must comply with landowners' requests by offering natural alternatives to herbicide spraying.
- 14725-11 | 11. Due to questionable property lines, land surveyors must be provided to landowners who have lines and towers on or near their properties.
- 14725-12 | 12. Upon landowner's request, BPA will reimburse the cost of biologists and foresters, each having a minimum 4-year degree and 5 years work experience in their respective fields.
- 14725-13 | 13. BPA must pay a stipend of \$5,000 to each landowner toward expenses incurred as a result of responding to this proposed project.

Thank you,

The board of A Better Way for BPA
Cheryl Brantley – Chair
Ray Richards – Vice Chair/Treasurer
Paula Overholtzer – Secretary
Jan Davis – Membership
A Better Way for BPA
[address]
Email: [email]
Phone: [phone]

- 14725-10 Section 3.15, Maintenance, describes how BPA's vegetation management is guided by its Transmission System Vegetation Management Program EIS. BPA adopted an integrated vegetation management strategy for controlling vegetation along its transmission line rights-of-way. This strategy involves choosing the most appropriate method for controlling vegetation and includes consultation with landowners regarding methods.
- 14725-11 BPA is not planning to perform property line surveys for easement acquisition. BPA's land surveyors would gather property boundary evidence to determine ownership of underlying parcels, but individual property lines would not be surveyed or marked on the ground. Approximate property lines would be shown on final easement acquisition documents and on BPA's Plan Maps.
- 14725-12 BPA has attempted to address all comments regarding potential impacts to properties. Any additional studies conducted by landowners would be at their expense.
- 14725-13 BPA seeks and encourages the public to comment on projects we propose as part of the NEPA process. BPA uses the comments received to make the best-informed decisions possible. Providing stipends for comments is not part of the process.

14726

BRAD L MIEDERHOFF

03/25/2013

Regarding vegetation management:

Please see the study "Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry," published Nov. 20, 2011 in the journal Analytical and Bioanalytical Chemistry.

14726-1

This study indicates that glyphosate (the primary active ingredient in Roundup, the most commonly used herbicide) accumulates in groundwater rather than fully degrading in soil as claimed by manufacturer Monsanto (who also brought us Agent Orange and dioxin). A number of studies conducted in Europe have shown that glyphosate causes birth defects, and is a endocrine disrupter. As an example, see the study "Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines," PubMed ID 19539684. Herbicides used within the power corridor will likely contaminate ground water, and this will likely impact the health of rural residents due to consumption and general use of well water.

Given this risk, a route should be selected with the least proximity to residents relying on well water.

14727

SCOTT R DARST

03/25/2013

14727-1

I urge you to choose the Western Alternative, which is lower cost and uses existing rights-of-way, avoiding destruction of our environment and seizure of private lands.

14726-1 Thank you for the information about a recent study of glyphosate. Section 3.15 of the Draft EIS discusses transmission line maintenance, including vegetation management. Using herbicides is one method for controlling vegetation and is part of an integrated approach to vegetation management, but it is not the only method BPA uses. As stated in Section 3.15, prior to controlling vegetation, BPA would contact landowners requesting information that would help BPA determine, along with field conditions, the appropriate method for vegetation control and mitigation measures, such as avoiding areas where there are domestic wells.

All action alternatives analyzed in the EIS contain properties that rely on well water.

14727-1 Comment noted.

14728

ERIC D GIACCHINO

03/25/2013

- 14728-1 I urge you to choose the Western Alternative, which is lower cost and uses existing rights-of-way, avoiding destruction of our environment and seizure of private lands.

14729

KIRA A SUNDERLAND

03/25/2013

- 14729-1 BPA must use their existing right of way, the West Alternative, as the only reasonable option for the I-5 Reinforcement project. It is the option with the least amount of damage to homeowners, the least environmental impact, and the least cost that would be passed on to rate payers and tax payers.
- 14729-2 The current EIS is flawed and as it does not provide a complete list of alternatives. BPA failed to perform a complete environmental review and analysis of the Pearl alternatives and double circuit towers along the west alternative.
- 14729-3 BPA also failed to include any statistical evidence showing a reliability problem along its existing transmission corridor or why reinforcing that corridor would contribute to a future reliability issue.
- 14729-4 Using BPA's West alternative would save 74 million dollars of public money and 1200 acres of land that would not need to be stolen from private citizens. Double circuiting through wetlands would result in zero net loss of wetlands. Double circuiting reduces the perceived health risks as found on BPA's website and in their DEIS.
- 14729-5 The proposed alternative would cause environmental devastation, going through pristine forested wetlands, streams, and protected riparian zones. It would cause extreme hardship to homeowners robbing them of their land, their investments, their rights, and their hopes and dreams. Please do the right thing.

14728-1 Comment noted.

14729-1 Comment noted.

14729-2 Please see the response to Comment 14596-4.

14729-3 There is no statistical evidence of a reliability problem because BPA would not knowingly allow the transmission system to operate at unsafe levels. BPA models future forecasts for load growth and other obligations that would use up capacity on the existing system, potentially leading to congestion and reliability problems if the wrong outages were to happen at the wrong times. BPA responsibly looks into the future to predict these issues before they happen and to have enough lead time to develop solutions.

14729-4 Please see the response to Comment 14460-1.

14729-5 Comment noted.

14730

LAURIE KINSEY

03/25/2013

Several questions are raised by the DEIS that BPA has put out.

- 14730-1 | 1) Why is this project being constructed in Clark County when there will be no benefit to Clark County's residents (BPA has said in past public hearings that it would be!)? If electricity is to be delivered to residents and/or businesses in Clark County, where are the tap off points on the proposed new line?
- 14730-2 | 2) It is obvious that the project is to benefit residents and businesses in Oregon and California. Now the questions is, why were all the Oregon routes originally proposed left out of the public scoping and the DEIS? If cost is BPA's answer, then let Oregon and California pay for the new lines and the higher construction costs with higher rates.
- 14730-3 | 3) Since Southwest Washington does not need additional power, why do its citizens have to suffer from the effects of having a new transmission line that no one wants?
- 14730-4 | 4) Why were not any routes in Skamania County considered? As above, if costs are a factor, then raise the rates for Oregon and California.
- 14730-5 | 5) Why was not the "Gray Route" chosen? This would have been a nice compromise between what BPA desires and the desires of those opposed to the line altogether. Again, costs, if higher, should be passed on the the ultimate users. These questions and many more have yet to be addressed to the satisfaction of the citizens of Clark County. Until they are, construction should not be commenced.

14731

WITTER/REVESZ FAMILY TREE FARMS, JANE M REVESZ, PETER REVESZ, PATRICIA LEE WITTER

03/23/2013

To: BPA, Army Corps of Engineers, Rep. Jaime Herrera, Better Way 4 BPA

Contents: Comment regarding a specific re-route proposal for a portion of Line 18 to supplement the packet of comments submitted earlier by Witter/Revesz Family Tree Farms

To All Whom It Concerns:

- 14731-1 | The cut-off of the comment period regarding the Central Alternative is almost here and our family has just today seen the attached map for a proposed re-route of a portion of Line 18. We have already submitted a package of comments, maps and photos to the agencies addressed above which outlines both our overall opposition to the Central Alternative, and our specific objections to the parts of Line 18 and Line 28 with which we are intimately familiar since they threaten our 60-year old family tree farm business.

- 14730-1 Please see the response to Comment 14685-1.
- 14730-2 Please see the response to Comment 14443-1 regarding the elimination of potential routes in Oregon from detailed study in the EIS.
- 14730-3 Please see the response to Comment 14685-1.
- 14730-4 Section 4.7.2.4, Northeastern Alternative, North of Silver Lake, Washington, Section 4.7.2.7, Transmission Line Routes Bordering U.S. Forest Service and WDNR Land East of the Project Area, and Section 4.7.2.8, Transmission Line Route East to Bonneville Dam, explain why potential routes farther east were considered but eliminated from detailed study. BPA believes that the reasons provided in the EIS for eliminating these alternatives sufficiently explain their elimination.
- 14730-5 Please see the response to Comment 14730-4.
- 14731-1 Comment noted.

14731-2 Today we would like to add a comment concerning the proposed re-route of one portion of the Line 18 segment of the Central Alternative.

The attached re-route map pertains to less than one mile of the Line 18 Segment but it appears to us to lessen significantly the harm to private property including our Dunegan Mountain Tree Farm. This re-routing also avoids damage to wetlands in [parcels] posed by the original location of Line 18 in the area shown on the map.

We therefore add our support to this re-route proposal.

Patricia Lee Witter

[address]

[email]

Jane M. and Peter T. Revesz

[address]

[email]

14731-2 Please see the response to Comment 14097-1.

14732

JUSTON M POELING, SHANNON POELING

03/25/2013

DATE: March 25, 2013

RE: BPA I-5 Corridor Reinforcement Project

SUBJECT: [address] [parcel information] Option F Alignment

- 14732-1 We are opposed to the currently proposed alignment of the power line placement in option F in Cowlitz County near Castle Rock Washington. We have sent previous correspondence to BPA representative in the past and have not received any responses. I have outlined the direct and indirect effects from this power line to our family and our neighbors below.
- Background:
- 14732-2 My wife and I purchased the referenced 6 acre parcel of property in the summer of 2009 and started building our retirement home the spring of 2010. We chose this location because of the serenity of the forest and was sold on the life style Weyerhaeuser promoted for the Skyline Ridge Forest Reserve. The location did not have any overhead power lines, has an abundance of trees and the traffic was very limited, the perfect location to retire and raise future generations or our family. The fall of 2010, 6 months after the start construction of our home and three months before move in, we get the BPA notice of the transmission lines....we were devastated.
- Direct Effects:
- 14732-3 Installation of these power lines will reshape the landscape of our neighborhood. The serenity of the forest would be lost; instead of the rolling trees we will be seeing an open cut for the power lines. The Right of way for the power line and access roads will require removal of several of the trees in the neighborhood leaving an unsightly landscape. This would be the opposite that Weyerhaeuser promoted to us; forest management and living with nature. Noise pollution will increase also; even though we live less than five miles from Interstate 5 we rarely hear freeway noises. With the open cut for the power line right of way this would leave a conduit for the noisy freeway to reach our home. However, we may not hear the freeway over the transmission lines; being our home will be less than 1500 feet from the lines we are anticipating considerable noise. Wild life; we commonly see deer, elk, bobcats and occasional bear in the neighborhood. These animals move freely in the area with the thick forest providing plenty of cover for their security. With this big cut for the power line right of way a good portion of this cover will be reduced considerably. Security; we currently have the old hunting roads blocked off and they have since been over grown by the thick forest. Once the open cut is made for the right of way and maintenance roads this will open access to many trespassers such as hunters and undesirables in our neighborhood.
- 14732-4
- 14732-5

14732-1 BPA considered all comments received during and after the project's official scoping period and the Draft EIS comment period. Comments were summarized and categorized for study and inclusion in the Draft and Final EIS.

We regret if project staff were unable to answer the commenters' previous questions. Now that BPA has identified a Preferred Alternative, BPA has worked with affected landowners to discuss line adjustments that could help minimize impacts to properties in the event that BPA decides to build the project. Please see the response to Comment 14097-1.

14732-2 Your home is now about 1700 feet west of the proposed transmission line. Please see the responses to Comments 14097-1, and 14328-5.

14732-3 Please see the response to Comment 14331-2.

14732-4 In your area, the proposed transmission line would parallel Fir Lane, which is also a big cut through the forest. Rights-of-way have been known to provide open grazing habitat for some of the species the commenter names such as elk and deer, which then attract predatory species such as bobcat and bear.

14732-5 Please see the response to Comment 14357-2.

Indirect Effects :

14732-6 Property values will obviously decrease over time in unmeasurable amounts, but we are anticipating as much as 20% decrease over time. Much of the additional value we have in our property would be unrecoverable if we made the decision to sell and relocate due to these power lines. The real estate market today will not value the improvements we made in our property to cover the costs we invested. At this point to relocate we would be looking at a 20% - 30% loss of investments.

Potential Solutions:

14732-7 BPA had commented in the public outreach meetings and in their publications that efforts were made to locate these lines on larger property parcels. Our location, which is a very small section of this line, does not seem to meet that profile. There are several larger parcels east of our location that potentially accommodate these lines with lesser impact to developing neighborhoods. Our neighborhood lots are 5 to 6 acre parcels zoned for single families. Locating these lines on or next to smaller lots will impact more homes and peoples plans for homes. The specific area would be the section along Fir Lane Road directly south of Headquarters Road. If no other option besides "F" is practical then every effort should be taken to swing this line east away from the neighborhood with the smaller parcels.

Summary:

These Power Lines will impact our family's and neighbor's quality of life, security and financial wellbeing as well as the native wildlife of the area. There is a reasonable solution to modify the alignment that should be taken seriously with minimal financial impact to the project. Not doing so would be an irresponsible act taken by BPA.

Respectfully Submitted,

Juston and Shannon Poeling

[address]

[phone number]

14732-6 Please see the response to Comment 14508-5.

14732-7 Please see the response to Comment 14097-1.

14733

DONALD E YOUNG

03/25/2013

- 14733-1 While am grateful that, at this time, the Western Alternative is not favored, the line still should be moved farther east than the Central Alternative, to unpopulated areas.
- 14733-2 Regarding the EMF effects in the draft EIS on the Summary of Electrical Effects : The selected year for modeling was 2019; in the initial years of operation. But what would these amounts and effects be like in later years with max loads on the lines or any future line capacity upgrade?
- On page 10, quote "The calculated electric fields on and at the edge of the right of way of the proposed transmission line would be much higher than the levels normally encountered in residences or offices". Only short term effects associated with the interaction of EMF from transmission lines with people on and near a right of way was mentioned but the summary does acknowledge possible long term effects. How might that affect us and our children 20, 30, or more years from now?
- The edge of right of way electric fields from the proposed line would be above the limits set in Montana and New York, two of 6 states that have set limits. The State of WA does not have guidelines. Per the summary, from the right of way edge out to 1,000 feet on either side of the line, the West Alternative and options would encompass a greater percentage of property zoned for residential use; about 46% of the property along the West Alt. is zone for residential use. The overall electrical effects would be greater along the West Alternative was the final determination.
- Using the Western Alternative, the system reliability would have inherent increased risk by placing the new line on towers immediately adjacent, or in some cases with limited right of way, replacing the existing tower and placing all lines on a single tower. Per the draft EIS, the West Alternative would have the moderate-to-high visual impact, the highest of the alternative routes.
- Per the draft EIS, the West Alternative would have the highest impact of right of way clearing of wetlands, with the most amount or approximately 116 acres cleared. Fill for tower footings would impact an additional 25 acres of forested, scrub-shrub, emergent, and aquatic beds wetlands with mostly high impact.
- 14733-3 Per the draft EIS, the West Alternative would have the highest impacted vegetation—forest and mature (not production) forest and the greater number of special-species impacted and special-status plants habitats, including the greatest acreage of biodiversity areas and corridors. It would also have a greater risk of bird collisions and would remove or alter some WDFW priority habitats Per the draft EIS, the West Alternative has source wells and water heads along the entire route. Plus the line would be within the sole source aquifer and Critical Aquifer
- Recharge Areas Category 1 and 2 Multiple agencies: Board of Cowlitz County Commissioners, Board of Clark County Commissioners, Senators Maria Cantwell and Patty Murray, Member of Congress Jaime Herrera Beutler, the Washington Education Association, several state representatives, and the Vancouver City Council, among others, have sent letters urging BPA to position the lines to impact the fewest people possible.

14733-1 Comment noted.

14733-2 Please see the response to Comment 14328-6.

14733-3 Comment noted.

14734

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY

03/23/2013

- Public Power on Public Land-The West Alternative that BPA already owns.
- 14734-1 These videos are what will be destroyed by your project through any new rural land. The environment will Permanently be destroyed. People's lives will be permanently impacted by the destruction of their piece of the American Dream.
- 14734-2 Viewsheds will permanently be destroyed marking down home/land values not only for the directly impacted landowner, but other homes and landowners who have views such as these in the videos.
- 14734-3 These viewsheds destroyed will not be reimbursed by BPA and we insist they are reimbursed fairly by the loss of their viewshed that are permanently destroyed by any new transmission corridor through the foothills of SW WA.
- Any new transmission corridor through rural communities is unnecessary when BPA already owns the majority of the West Alternative. Please enter these as Public comment on the I-5 Corridor Reinforcement Project
- 14734-4 Dole Valley community: <http://www.youtube.com/watch?v=hFQ-MlwFIFM&feature=share&list=FLqre1pnaCvYchdT9tsoLFRg>
- Route 26 and 30: <http://www.youtube.com/watch?v=-MjMdQSfemU&feature=share&list=UUqre1pnaCvYchdT9tsoLFRg>
- BPA publicly stating they own most of the West Alternated and they could place these lines on this existing R/W:
<http://www.youtube.com/watch?v=59EGpEKotBo&feature=share&list=UUqre1pnaCvYchdT9tsoLFRg>

14734-1 Please see the response to Comment 14328-5.

14734-2 Please see the response to Comment 14325-3.

14734-3 Please see the response to Comment 14566-9.

14734-4 Comment noted.

14735

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY

03/23/2013

- 14735-1 Pesticide use along any new corridor is a huge concern for our communities. Many have shallow wells, on all the rural routes there are areas of communities relying on natural springs/surface water. Some wells are as shallow as 30 feet. All are threatened by pesticide/herbicide spraying. Some landowners pride themselves in growing organically or raise farm animals to consume.
- 14735-2 We demand BPA offers nearby landowners natural alternatives to spraying toxic chemicals near their land.
- 14735-3 Our rivers and pristine waterways will be threatened by any pesticide/herbicide use.
We demand BPA does not continue business as usual by letting noxious weeds enter into any area along any of the proposed routes.
- 14735-4 We demand that BPA invests much more money and labor towards the control of invasive species and restoring vegetation habitat that has been lost to noxious weeds.
We demand that BPA replants native species killed by the building of these transmission lines.
- 14735-5 Your West Alternative already proves to us that BPA doesn't care about the environment by allowing invasive species of vegetation to take over.
- 14735-6 We demand that BPA puts effort towards being a good steward to the land just as BPA flaunts its efforts to repair damage to the waterways and fishes they have caused by past projects.
Herbicide use is threatening to our health, our environment, and to our future generations.
Please include these videos on the as public comment in the Draft Environmental Impact Statement.
- 14735-7 <http://www.youtube.com/watch?v=S-Bn9PtU0k&feature=share&list=UUqre1pnaCvYchdT9tsoLFRg>
<http://www.youtube.com/watch?v=IJ4OlrgIU3E&feature=share&list=UUqre1pnaCvYchdT9tsoLFRg>
<http://www.youtube.com/watch?v=4WFbEqysmig&feature=share&list=UUqre1pnaCvYchdT9tsoLFRg>

- 14735-1 Section 3.15, Maintenance, discusses transmission line maintenance, including vegetation management. Using herbicides is one method for controlling vegetation and is part of an integrated approach to vegetation management, but it is not the only method BPA uses. As stated in Section 3.15, prior to controlling vegetation, BPA would contact landowners requesting information that would help BPA determine, along with field conditions, the appropriate method for vegetation control such as near areas used for organic farming.
- 14735-2 Please see the response to Comment 14160-1.
- 14735-3 Please see the response to Comment 14665-15.
- 14735-4 Please see the response to Comment 14665-15.
- 14735-5 Comment noted.
- 14735-6 Please see the response to Comment 14726-1.
- 14735-7 Please see the response to Comment 14160-1.

14736

JENNY L BARON

03/25/2013

14736-1 I am writing this email to express my opposition to BPA's I-5 reinforcement project which includes a proposed high voltage line, with 150 foot aerial towers, that will come very close to our neighborhood, Winsor Estates, in the Larch Mountain, Washington area.

BPA's current preferred alternative would be placed on the western edge of the Longview Timber land adjacent to our neighborhood on the east side. As a family, we are bewildered that such a thing can be happening to such a beautiful area!

14736-2 My husband and I spent a year researching areas in the U.S. that we wanted to move to from the land of shopping malls and traffic jams, also known as Atlanta, Georgia. Once my husband found a job here, we spent an additional 9 months looking for a home in a beautiful, family-oriented community of like-minded people who relished living away from the fast-paced, traffic-congested, rabid commercialism of big city life. We put a great deal of effort, and a lot of money, into locating a home that would blend in with nature.

Just like the people who CHOSE to live around existing power lines and substations in the existing I-5 Corridor, we CHOSE to live away from all that! We willingly gave up proximity to stores, malls, fast food establishments, noise, congestion, and unsightly structures. We paid more, in both land costs and structural costs, to buy a view property in which we could blend in with the trees and beauty around us. There are hundreds of homes located in small subdivisions all around this part of Larch Mountain, with people who were willing to give up a lot of modern "conveniences" in order to get a lot more of what is important to them - a beautiful, natural setting. We don't want this taken away from us.

14736-3 We feel that the power lines should either be placed near the existing lines (areas people CHOSE to live already next to them!), or much further east, where there are fewer people affected by them. The Army

14736-4 Corps of Engineers must issue a permit for this project. At present, the BPA has only requested a permit for one alternative - the Central Alternative, Option 1.

14736-5 The BPA chose the Troutdale alternatives in Southwest Washington over the Oregon Pearl alternatives because Troutdale has an existing right of way. Thus, we demand that BPA request a permit from the Army Corp for its existing right of way, the West Alternative, using double or triple circuit towers through wetlands or for the entire length of the West Alternative. Please reconsider your choices for the I-5 Corridor Reinforcement Project and leave our beautiful neighborhoods the way we choose to create them.

14736-1 Thank you for your comments. Specific comments are addressed below.

14736-2 Please see the response to Comment 14328-5.

14736-3 Comment noted.

14736-4 Comment noted.

14736-5 Please see the responses to Comments 14377-5 and 14460-1.

14737

MICHAEL E BLAKE

03/23/2013

14737-1

We are concerned about the proposed line crossing the Cowlitz River north of Castle Rock. The high river-bank dredge spoils are extremely fragile and could slide, erode, and liquify during an earthquake or flood. How could 150ft towers ever be safe on this site? I would like the BPA to answer this question with facts and evidence about this site not generalities. One more thing: VOLCANIC LAHARS from just upstream should also be considered.

14737-1 Chapter 14, Geology and Soils, acknowledges that site-specific geotechnical investigations would be done at potential landslide and liquefaction prone areas (and other areas where sub-surface information is needed) to evaluate the potential for these areas to experience landslides or liquefaction. Some of these investigations have been done and there are more to do. The results from these studies have been incorporated into the location and design of project facilities and subsequent results from additional studies will be used the same way. If needed, mitigation measures, such as those described in Chapter 14, Geology and Soils, to reduce the risk of landslides, erosion, and liquefaction to the towers would be implemented.

Potential volcanic lahar hazards are described in Chapter 14, Geology and Soils. To the extent possible, towers near or within a lahar hazard zone will be sited to avoid lahar hazards, but because of the large area potentially affected by volcanic phenomena (such as lahars), not all hazards from a volcanic eruption can be avoided.

Please also see the response to Comment 14493-7.

14738

WILLIAM E MOYER

03/25/2013

14738-1 NOTE: Comments submitted earlier today, March 25, 2013, with confirmation received at Noon today. Due to length of comments and loss of formatting using this comment box, I'm resubmitting my comments as a PDF for easier reading. -WEM

Questions and Comments Regarding the I-5 Corridor Reinforcement DEIS and Proposed Build of a new 500 kV Powerline through Clark and Cowlitz Counties

14738-2 1. Why doesn't BPA adopt a route-selection principle of minimizing high-voltage powerlines' proximity to people's homes, to schools, and to places of business with near-continuous occupancy during business hours? Doing so would seem to provide compelling benefits to the public as a whole and to BPA itself, as detailed below, both now and going forward.

The public and our elected officials could reasonably predict in advance which of multiple parallel routes is most likely to be selected by BPA and which are likely non-starters, except under extraordinary circumstances which BPA would presumably justify in exhausting detail.

Owners of properties located along selected more-isolated rural right-of-ways would endure proportionately-smaller property losses due to takings from their generally proportionately-larger private and commercial rural parcels.

14738-3 Exposure of the public, especially the most vulnerable, infants, young children (both at home and at school), and the elderly (especially those largely-confined to their homes or residences), to any and all long-term and intermittent potential hazards due to proximity to powerlines would be minimized. That includes: (a) hazards due to long-term powerline EMF exposure (an open question as discussed further in comment 5, below), (b) any hazards due to current or future practices using herbicides to clear or reduce vegetation beneath overhead powerlines within the right-of-way, (c) long-term stress due to fears (whether irrational or justified) of health hazards due to proximate powerlines, (d) long-term stress due simply to the annoyance of hearing continuously humming and intermittently snapping and crackling powerlines outside one's home, school, or place of business.

14738-4 Destruction or degradation of residential scenic views not presently obscured by interposed powerlines and power towers (which contribute so much to property values and quality of life in the home), would also be minimized.

14738-5 BPA route-planners and line builders would be able to more easily select detailed powerline route paths along the edges of the affected more-isolated and most-probably larger rural parcels, to minimize (and ideally to eliminate) orphaning of presently and potentially productive private, federal, state, and DNR forest lands (fractions of productive parcels) which would otherwise be located on the far side of the new right-of-way from their current and planned access roads. (Detail routing would be easier with less zig-zagging required at the boundaries of fewer numbers of physically-larger parcels.) This should

- 14738-1 Comment noted.
- 14738-2 Section 2.1, Facility Siting, describes some factors that BPA considers when siting transmission facilities. Proximity to homes, schools and businesses and existing land uses are considered.
- 14738-3 Comment noted.
- 14738-4 Please see the response to Comment 14325-3.
- 14738-5 BPA considered potential impacts to forestry practices when siting the transmission line. Please see the response to Comment 14345-3.

14738-5 minimize losses of productive forest lands and consequently reduce the number and costs of lawsuits by unhappy affected productive forest land-holders.

14738-6 BPA would potentially have to compensate fewer numbers of land-holders (including private individuals, corporations, DNR, and other trusts) for lands necessarily taken for the selected right-of-way. The presumed lower per-square-foot value of such taken lands, compared against the per-square-foot values of smaller urban and rural residential properties which would be needed to expand or provide extensions to the existing the right-of-way, would at least partially compensate for the greater distances and costs required by a more-remote routing selection. And specifically by selection of the Central route, (presently designated the BPA's currently preferred alternative and presumably the highest-probability build route) in comparison with the Western route, or the "grey line" route compared to the Central route, the Western route, and indeed all of the routes still under consideration by BPA presently.

14738-7 BPA's legal costs of defending the FEIS selected route from challenges by fewer numbers of property-holding stakeholders would likely be less than would be the case with greater numbers of potential litigants (including the otherwise only indirectly-impacted city of Vancouver should the Western-route be chosen as the preferred route for the FEIS), even presuming some aggregation of class-action lawsuits. BPA would also avoid or minimize "attractive nuisance" type lawsuits associated with children coming and playing within the right-of-way, whether such is deemed safe or not by authorities. If it's wide open and green, children will be attracted to it, with the humming , popping, and crackling sounds providing additional incentive for them to play there (let alone when they discover they can visibly energize fluorescent lighting tubes simply by holding them up beneath the high-voltage powerlines), even if there are no tall trees to climb.

2. Under what circumstances might BPA select a different preferred alternative route for the FEIS and planned build, be it the Western route impacting larger numbers of residential and school properties, or the grey line or other more-isolated and remote, but potentially more costly route (excluding potential and/or probable legal costs)? And when and how would BPA inform the public of such a substantial and meaningful change in the project's direction?

14738-8 If the latter ("grey-line") route were to be selected in the FEIS, one could anticipate a potential windfall for BPA's public relations. And as discussed at some length herein, total project costs might well not be substantially impacted.

If the former (Western) route were to be selected in the FEIS, then BPA would seem to be at some hazard to accusations of fraud or even conspiracy to deprive the public and local government officials of the opportunity to provide meaningful input to the FEIS process and to participate in selection of the final planned build route. Positing a friendly judiciary response, from the Western route affected public's perspective, BPA would be at risk of substantial opportunity costs: (a) if their then-chosen FEIS preferred route were to be forbidden outright by the courts, or (b) if BPA's property-holder compensation costs were extraordinarily expanded by the courts. Regardless of legal outcome, it would be a public relations nightmare for BPA, and one likely to haunt BPA for years if not decades to come.

14738-6 Comment noted.

14738-7 Comment noted.

14738-8 BPA has not changed its Preferred Alternative. The reasons for identifying the Central Alternative Using Central Option 1 have not changed. If BPA had identified a different preferred alternative, BPA would have used the same methods of notification used for previous project updates including the project website, mailings, email notification and press releases (see Chapter 1).

- 14738-8 Not playing the game strictly according to Hoyle, or perhaps more importantly, not being perceived as playing the game according to Hoyle, has consequences. Violating the Caesar's wife's dictum is always best avoided.
- 14738-9 3. Although in the past there was generally thought to be only a slight permanent loss in property values, and hence to local property-tax revenues, due to proximate high-voltage powerlines, that perception is changing. And BPA's property compensation exposure may well be substantially greater than presently assumed in the DEIS and BPA's present project planning, which only includes compensation for lands physically taken for the right-of-way itself.
- 14738-9 Possibly because of our increasingly-litigious society and possibly because urban property and homeowners in particular regard their real estate (especially their homes) as being their only real store of substantial value for the future, public clamor for compensation of measurable or calculable losses due to forced-proximity to new powerlines seems inevitable. Whether current property value-taking compensation laws could be construed to mandate compensation for "damages" to proximate properties, or new legislation to so-extend such laws, prior to start or completion of this project are in effect, BPA's financial risk would seem to be greater for urban or more-heavily populated rural routings and to be proportional to the number of affected stakeholders.
- 14738-10 Appraisable (and likely-demonstrable in court) losses in property values could well be in the range of 7-25% for nearest proximate properties, with proportional losses for next-furthest properties within direct line-of-sight of new 15-story power towers. (And that magnitude of losses without any changes in allowable ELF or LF magnetic field exposure levels, which may not be a safe assumption presently. Please see comment 5 below.) Probable total costs to the project of shorter residential routings, especially the Western urban routing, may well exceed that of greater length routings like the eastern routing or the far-eastern "grey line" routing concept.
- 14738-10 References: (1) Bond, Sims, and Dent, "Towers, Turbines, and Transmission Lines: Impacts on Property Value," Wiley-Blackwell, 13 May 2013, forthcoming; and (2) Baer and Bolton, "High Voltage Power Lines - Measuring the Impact on Real Property Market Value," Presented at the Continuing Legal Education International Eminent Domain Conference, Austin Texas, by Wayne Baer, MAI, Partner, Bolton and Baer Real Estate consultants, Inc., 24-Feb-2011 ([http://www.bbrec.com/attachments/wysiwyg/9/HVPL\(1\).pdf](http://www.bbrec.com/attachments/wysiwyg/9/HVPL(1).pdf)).
- 14738-11 4. As shown convincingly in the recently-published study by the non-profit NLPA group, local tax revenue losses, especially for the Western route and to a lesser but not insignificant extent for the Central route (the DEIS preferred alternative route), would be more than significant in the near term and more than 4 times higher by 2030.
- 14738-11 Reference: I-5 Corridor Reinforcement: Economic and Human Impacts to Southwest Washington State from Bonneville Power Administration's Transmission Line, by No Lines in Populated Areas, Rural or Urban (NLPA), 13 March 2013, <http://nowaybpa.com>, and specifically http://www.nowaybpa.com/images/stories/NLPA-ECONOMIC_AND_HUMAN_IMPACTS_OF_BPA-I5.pdf

14738-9 Please see the response to Comment 14140-2.

14738-10 Please see the response to Comment 14104-2.

14738-11 Please see the responses to Comments 14110-1 and 14291-3.

- or <http://www.stoptowersnow.com> and specifically <https://docs.google.com/file/d/0Bw-77rxIUkVWTF8zeXR6ZkctY3M/edit?usp=sharing&pli=1> for online viewing.)
- 14738-11 While building a shorter route through populated areas may be less costly to BPA up-front, the costs to society as a whole, and most specifically to the taxpayers of Clark and Cowlitz County would be maximized. Should BPA choose and build on one of the more-costly to the counties routes, it would be appropriate and expected for Washington State, County, and other local government officials to seek redress and financial compensation for that on-going lost tax revenue. That would decrease the savings BPA might be expecting, based on arguably excessively-simplistic cost per mile, length of route considerations. This especially since the bulk of the benefit for the new powerlines is arguably to entities located south of the Columbia River.
- 14738-12 BPA's oft-stated argument that the proposed powerline reinforcement benefits Washington and Oregon state residents equally is patently false. It is largely an artifact of BPA's treating the greater Portland metropolitan area (including all of Clark county and part of Cowlitz County) as an irreducible node for publicly-presented power consumption calculation purposes.
- In point of fact, independent estimates based on more-detailed BPA, Clark Public Utilities, and Cowlitz Public Utilities District documentation, show no more than 15-20% of the increased capacity of the I-5 Reinforcement will benefit residents of Clark and Cowlitz Counties combined, as detailed in previously submitted comments by this writer: I-5 Corridor Reinforcement Project Considerations to Senators Patty Murray and Maria Cantwell, with copies to Clark County Commissioner Steve Stuart and Cowlitz County Commissioner Axel Swanson, and to Steve Wright and Mark Korsness at BPA, 7 September 2010. (If needed, an electronic copy of that earlier letter and its multiple attachments can be provided directly to BPA for inclusion in the I-5 Corridor Reinforcement Project's public comment record, if the copies sent to Steve Wright and Mark Korsness in 2010 have since been misplaced or misfiled.)
- 14738-13 In a more-just universe, one might suppose that the financial burdens of the I5 Corridor Reinforcement Project would be similarly distributed between Washington and Oregon state residents as the benefits are. Thus far, public perception is that the opposite is true, with the bulk of the costs being borne by the least of the beneficiaries of the improvements.
- In the interests of simple fairness and clarity of presentation, in distinct contrast to the DEIS, the FEIS needs to provide a clear breakout of the local capacity improvement benefits to that part of the Portland-metro node's customers north of the Columbia river and that part of the node's customers south of the Columbia river. (Should BPA require assistance in providing such an analysis, a number of the interested and qualified members of the non-profit NLPA would likely be more than capable of providing same, and would I think be thrilled to do so, although I cannot speak for them.)
- 14738-14 5. Although not perhaps as well appreciated as it should be by the majority of practitioners within the electromagnetics and electrical power communities, the fundamental regulatory safety limits for EM fields are presently to an extent in flux. It appears increasingly likely to some within the EM community who are familiar with the issues, in particular to this writer, that powerline right-of-way width requirements will increase within the foreseeable future and quite possibly before the end of 2017. That

14738-12 Please see the responses to Comments 14329-7 and 14494-2.

14738-13 Please see the responses to Comments 14329-7 and 14494-2.

14738-14 Please see the response to Comment 14328-6.

The EMF information specific to the area around your home is provided in Table 17 and Figure 32 of Appendix F.

- requirement change would most-probably be driven by a (likely-reluctant) consensus within the electromagnetics scientific and engineering communities, that there now is consistent empirical evidence of nonlinear biologically-significant effects from exposure to amplitude-modulated extremely-low frequency (ELF), low frequency (LF) magnetic fields, and radio frequency (RF) Fields. ELF and LF fields in point of fact with peak intensities comparable to those typically found at and substantially beyond present high-voltage powerline right-of-way boundaries.
- Whether empirical evidence of significant biological effects from exposure to very low level magnetic fields establishes a substantial likelihood of harmful biological effects at much-lower levels than those currently recognized in regulatory safety limits, as has been suspected by some members of the community for some years now, is and will remain an open question for some additional time to come.
- 14738-14 But when that evidence is accepted, when a new scientific and engineering consensus is achieved, the proven existence of significant nonlinear biological responses to such extremely low levels of ELF or LF magnetic fields will logically necessitate the re-evaluation of most if not all previously-considered to be contradictory or negative biological response measurements and experiments, and hence of the sufficiency of presently-accepted linear thermal damage-based allowable exposure limits. Nature it appears is just not that simple.
- How long it might take before federal EM safety regulations catch up with the science and change to accommodate the new consensus, mandating lower exposure limits than are sustainable using existing high-voltage powerline right-of-way clearance distances is to say the least uncertain. But it could well occur within 3-7 years after such consensus is achieved, which in this writer's opinion, likely overlaps this particular projects planned build timeframe.
- To this writer it appears that BPA's near-term post-consensus dilemma, likely prior to the start of and almost certainly prior to the completion of the build and energization of this project, is then relatively simple.
- 14738-15 If BPA goes ahead and in the FEIS selects a more-heavily populated area routing path, such as the Western route or to a lesser extent the Central route (the DEIS preferred alternative route), rather than a more-remote further-east route, and especially if BPA then builds the new powerline on that route, then BPA would be doing so in full knowledge that there are in-fact measurable and repeatable biological effects attributable to proximity to a newly constructed powerline. And hence BPA would then logically be potentially liable for some portion, if not the lion's share, of a great many truly-horrendous costs. That would be those costs associated with condemnation of (and elsewhere-located replacement of) no-longer deemed safely-habitable properties located along the right-of-way for that new powerline. And that I think whether the regulatory process has produced new more stringent safety limits yet or not. (The phrase "knowing and reckless endangerment of the public" comes somehow all-too-readily to mind, should there be future legitimate EMF-danger or damages-inspired lawsuits by impacted property owners. Indeed, I might well find myself party to such a lawsuit and I don't live particularly close to a segment of the Western route, which is nonetheless located along the edge of my neighborhood. And unlike many, I really, really don't want to play the feed the lawyers game.)

14738-15 Comment noted.

14738-15

This in combination with what appear to be all-too likely expansions of property takings compensation requirements (as discussed in comment 3, herein) for proximate properties whose resale value will then most-certainly be further impacted, even when located outside any new clearance distances to be required of new or future powerlines, strongly suggests that minimizing proximity to residences, schools, and places of business occupied throughout the business day is mandatory. The potential financial risk to BPA of doing otherwise, of not proactively adopting a prudent-avoidance policy for new powerline construction and planning, with regard to exposure to presently-suspect magnetic field intensities, would appear to be completely financially untenable for BPA.

And BPA should make no mistake here. Many in the community are unhappy with and distrustful of BPA. And no one outside of BPA or another powerline organization is going to view physically-closer and substantially-taller powerlines as anything but a new powerline, logically and properly subject to new constraints and new requirements, whether located largely-within an existing right-of-way or not.

14738-16

6. Based on the arguments presented in comments 1-5 herein and in the references cited, one could conclude that minimizing proximity of new high voltage powerlines to residences, schools, and full-time occupied workplaces, basically in not routing new high-voltage powerlines in populated areas, is not just the right thing to do from an ethical and moral perspective. It makes business sense to do so. To do otherwise would be to unnecessarily court significant financial risks, if not utter disaster. And courting disaster is never a good idea.

Respectfully submitted, 25 March 2013, by William Moyer, resident of Clark County, address: [address];

e-mail: [email]

14738-16 Comment noted.

March 13, 2013

**RE: Bonneville Power Administration, I-5 Corridor Reinforcement Project
Double-circuit towers on wetlands and Oregon alternatives**

To Whom It May Concern:

14739-1 I am writing you today because I believe Bonneville Power Administration (BPA) did not provide a full range of alternatives, including complete and substantive analyses both quantitatively and qualitatively as required by law in any Environmental Impact Statement.

Double-circuit towers not studied

Under a Freedom of Information Act (FOIA) request to BPA asking for studies on double-circuit towers on wetlands along its West alternative (BPA-owned existing right-of-way), we received a response stating there were "no documents responsive to our request."

In 2009 BPA told my community that putting towers side-by-side along their West alternative would be a reliability problem. They told us using their West alternative would be putting all their eggs in one basket if an airplane hit the lines or if there were a terrorist attack.

14739-2 On August 18, 2011, there was a response to several questions from Maryam Asgharian, a BPA contact person for this project. One question that was asked was "Has there ever been a tower collapse or line failure along their existing easement (West alternative). Her response was "*We have not seen a tower collapse along this line. We have seen insulators fail or be vandalized. If this occurs, it would likely be along one span (between two towers), rather than the whole line. Once we are aware of an issue like this we can repair it within hours.*"

There is clearly not much of a reliability problem based on the 70-year history of this transmission corridor.

Using BPA's West alternative would save 74 million dollars by BPA's estimate. This would also minimize the impact to the environment. Double circuiting through wetlands would result in zero long-term net loss of wetlands. BPA's new double-circuit design reduces the perceived health risks, as found on BPA's web site¹ and in their Draft Environmental Impact Statement² (DEIS) for the I-5 Corridor Reinforcement Project.

¹ BPA Engineers Build A Better Tower, Saving Millions: <http://www.bpa.gov/news/newsroom/Pages/BPA-engineers-build-a-better-tower-saving-millions.aspx>

² <http://www.bpa.gov/Projects/Projects/I-5/Pages/Draft-EIS.aspx>

14739-1 Please see the response to Comment 14596-1.

14739-2 Please see the response to Comment 14460-1.

14739-2

BPA's new double-circuit tower design

- Uses fewer towers: *"4 per mile in some places"*
- Costs less: *"saves BPA an average of \$18,000 to \$270,000 per tower"*
- Uses less right-of-way and creates less Electromagnetic Field levels: as noted on page 3-2, section 3.2.1 Tower Types in the DEIS.

Double circuiting for the entire right-of-way would place towers on the center of the right-of-way instead of near the edges, which would increase the distance from homes, businesses, and schools, would use half as many towers and would not require removal of as much vegetation along the edge of the existing corridor.

Pearl Alternatives (Oregon) not given a thorough Environmental Assessment as required under the National Environmental Policy Act.

For approximately ten years, the I-5 Corridor Reinforcement Project was a study of Oregon (Pearl) and Southwest Washington (Troutdale) alternatives. In 2009, just days before an announcement went to the public, BPA made the decision to not carry the Pearl alternatives through a full Environmental Assessment and made the decision to only study the Troutdale alternatives. In late 2009, a FOIA request was submitted for the Agency Decision Framework (Version 6)³ discussing the prematurely dropped Pearl alternatives. From that documentation I learned that BPA planned to not let the Pearl alternatives "go public" for many reasons, most of which made little sense.

Two examples are the following:

14739-3

1. BPA states the Pearl alternatives would impact 3,100 landowners, whereas the Troutdale alternatives impacts 7,700 landowners. Since the Pearl alternatives would impact less than half the number of landowners, why did BPA drop it?
2. BPA states concerns regarding a new river crossing at the Columbia River in Longview, *"requiring very tall towers up to 450 feet tall."* This should not be a concern because the existing transmission towers crossing the Columbia River in Longview are **over 450 feet tall.**

Both the Troutdale and Pearl alternatives had similar scenarios, as stated in the Agency Decision Framework (Version 6).

"All Pearl routing alternatives would need to go through some residential areas," "would go through managed timber lands," "would go near or through established wildlife areas and near or on private airstrips,"

³ http://abetterway4bpa.org/index.php?option=com_docman&task=cat_view&gid=92&Itemid=77

14739-3 Please see the response to Comment 14596-3.

- 14739-3 However, in the decision to only study the Troutdale alternative BPA stated that *"The Pearl alternatives do not offer a route on existing right of way, whereas the Troutdale plan does."*
- In that case why didn't BPA choose an existing right-of-way, the West alternative, for its preferred alternative? I think this is the most reasonable choice. If BPA persists in its decision to waste millions of dollars and hundreds of acres and invade, take, and devalue the properties of private landowners by building a new transmission corridor, then it should also be considering the Pearl alternatives to find the route least damaging to private property owners and the environment.
- BPA wrote *"a new line in either corridor (Pearl or Troutdale) would fully meet our electrical needs,"* and *"proposing and thoroughly analyzing up to 88 segments (Pearl alternative and Troutdale alternative) will send a clear message that we considered all possible routes and have selected the very best alternative."* I believe this is exactly what BPA should have done.
- 14739-4 The current Draft Environmental Impact Statement is flawed without a full range of alternatives included. To provide a full range of reasonable alternatives, BPA should perform a complete environmental review and analysis of the Pearl alternatives and double-circuit towers on wetlands along the West alternative.
- 14739-5 The Army Corps of Engineers must issue a permit for this project. BPA has only requested to permit one alternative, the Central Alternative, Option 1. Since BPA chose the Troutdale alternatives over the Pearl alternatives because Troutdale has an existing right-of-way, I demand that BPA requests a permit from the Army Corps of Engineers for its existing right-of-way, the West Alternative, using double circuit towers through wetlands.
- 14739-6 I am asking that you work with me to ensure all alternatives, including double circuit towers and Pearl alternatives are given a complete and thorough analysis, both quantitatively and qualitatively by bringing these issues to light and commenting to Bonneville Power Administration and the Army Corps of Engineers during the public comment period for the Draft Environmental Impact Statement. Both of these comment periods end at noon, March 25.
- 14739-7 Sincerely,
- Using the existing right of way has the least impact on land and people. Please do the right thing and use the West Alternative.*
- Kris A. Dumbauld*
- cc: David Bricklin, Bricklin and Newman LLP

14739-4 Please see the response to Comment 14596-4.

14739-5 Please see the response to Comment 14460-1.

14739-6 Comment noted.

14739-7 Comment noted.

14740

A BETTER WAY FOR BPA, CHERYL KAY BRANTLEY

03/23/2013

Native American history of the Chelatchie Prairie/Upper Swift/Amboy areas as noted on Page 9 of the 2004 50-year Relicensing Agreement for PacifiCorp. Historic Properties Management Plan

Swift No. 1 Hydroelectric Project (FERC No. 2111), Yale Hydroelectric Project (FERC No. 2071), and Merwin Hydroelectric Project (FERC No. 935)

Clark, Cowlitz, and Skamania Counties, Washington

Most of the areas known to have been used by Indians in the Lewis River drainage are linked to the "Klickitat Trail" that ran from Ft. Vancouver to the Yakama area. Captain George B. McClellan's expedition went up the Klickitat Trail in 1853, documenting the route of the trail and Indian use of the Lewis River drainage. Interpretation of the route maps is difficult given McClellan's incomplete understanding of local topography. Leading out of Ft. Vancouver, the trail went northward, crossing the Cedar River and Chelatchie Prairie on its way to the North Fork of the Lewis River. After crossing onto the north side of the North Fork somewhere in the eastern third of Lake Merwin, the trail ran north up Speelyai Creek, then it turned east and rejoined the Lewis River somewhere near the western end of present-day Yale Lake. It continued along the north side of the river until it crossed back to the south somewhere between Northwoods and Curly Creek Falls. After this crossing, the trail continued east and into the present-day Indian Heaven Wilderness.

14740-1

During their trip up the Klickitat Trail, McClellan's party found the travel difficult, particularly through heavily wooded sections. Travel became somewhat easier, particularly through fern-covered prairies like Chelatchie Prairie. Indian place names for locations along the Klickitat Trail generally coincide with these fern-covered prairies. Chelatchie Prairie takes its name from the Klickitat or Yakama word *ch'alacha*, (lit. "of bracken fern") (Hajda et al. 1995). McClellan's party noted an open area along Speelyai Creek containing both grass and ferns. This location has the Indian place name *spily?y* (lit. "coyote") (PacifiCorp 1999). Further up the trail, Lt. Duncan (1855), a member of the expedition, mentions a "place called by the Indians *Lakas*" that would have been somewhere between the present-day towns of Yale and Cougar. Duncan's "*Lakas*" is probably an Anglized version of *ilik-ash* (lit. "place of kinnikinnick"). "*Lakas*" probably coincides with the zone of xeric-adapted vegetation that grows on the Yale Lava Flow, which would provide the only habitat for kinnikinnick in the area.

Moving upstream, McClellan's party crossed the Swift River, which they gave the name "*Noompt-nah-mie*" (Minter 1855) or "*Noomptnamie*" (Stevens 1861), which probably corresponds to the place name "*Loompt-nee-mee*" recorded by McWhorter (n.d.), a Klickitat word meaning "belongs to the blue." Hajda et al. (1995:46) suggest that the name "refers to a 'blue-looking' mountain, perhaps Marble Mountain," which is about 6.8 km (4.2 miles) to the northeast of the mouth of the Swift River. Minter reported that the party "crossed the *Noompt-nah-mie* near its mouth, and encamped at the crossing; no grass; crossing difficult in low water; impossible in high water...." The next day, the party made camp at a location called "*Wininepat*" (Minter 1855). The exact location of *Wininepat* is not clear, but it appears to have been somewhere in the vicinity of Swift Forest Park. No translation for this place name is currently available. Soon after leaving

PacifiCorp

Lewis River Hydroelectric Projects

FERC Project Nos. 935, 2071, 2111

HPMP – Page 10 April 2004

Wininepat, the trail crossed the Lewis River and continued to the east toward the southwest and McClellan Meadows.

- 14740-1 Thank you for the information regarding the history of this area. BPA will consider this in its process to identify any cultural resources that may be impacted by the proposed project.

From: noreply@bpa.gov
Sent: Saturday, March 23, 2013 3:01 PM
Subject: 14741: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
 Bonneville Power Administration

Name: Cheryl K Brantley
Organization: A Better Way for BPA Dole Valley Landowners Coalition Friends of Green Mt Tum Tum Mt Area Landowners Coalition
E-mail:
Phone:
Address:

Group type: Special interest group

Please ADD me to the mailing list.

Comment:

14741-1

Landslide documented along all SW WA foothill rural routes: RE: USGS Geologic Map of the Amboy Quadrangle, Clark and Cowlitz Counties, Washington By Russell C. Evarts Pamphlet to accompany Scientific Investigations Map 2885 2005 U.S. Department of the Interior U.S. Geological Survey <http://pubs.usgs.gov/sim/2005/2885/> LANDSLIDE, TALUS, AND ALLUVIAL DEPOSITS Landslide (Qls) and talus deposits (Qt) are common beneath cliffs in the Amboy quadrangle. Notable accumulations of talus have formed below the glacially steepened north flanks of the east-west-trending cuestas of Green Mountain and the ridge south of Speelyai Creek and on the east side of Dunegan Mountain. Most landslides result from failure of weathered, clayey, Paleogene volcanoclastic rocks (Tvs, Ti, and sedimentary interbeds within flow-dominated units Tba, Tbem, and Ta). Younger poorly lithified deposits are also susceptible to sliding, especially on steeper slopes. Only the larger landslides are shown on this map; many areas underlain by unconsolidated Quaternary units contain small slumps and debris-flow deposits that are too small to portray at 1:24,000 scale. Unconsolidated alluvium (Qa) forms local and ephemeral accumulations along the active courses of Speelyai and Cedar Creeks and small alluvial cones at the base of steep gullies on the north slope of Green Mountain. Some areas mapped as alluvium, such as along Buncombe Hollow Creek and near the southeast corner of the quadrangle, are the former channels of glacier-margin streams and these deposits are probably late Pleistocene age.

14741-1 Please see the response to Comment 14717-3.

14741_attachment



Geologic Map of the Amboy Quadrangle, Clark and Cowlitz
Counties, Washington

By Russell C. Everts

Pamphlet to accompany
Scientific Investigations Map 2885

2005

U.S. Department of the Interior
U.S. Geological Survey

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INTRODUCTION

GEOGRAPHIC AND GEOLOGIC SETTING

The Amboy 7.5' quadrangle is situated in the foothills of the western Cascade Range approximately 50 km northeast of Portland, Oregon (fig. 1). Since late Eocene time, the Cascade Range has been the locus of an active volcanic arc associated with underthrusting of oceanic lithosphere beneath the North American continent along the Cascadia Subduction Zone. Volcanic and shallow-level intrusive rocks emplaced early in the history of the arc underlie the Amboy quadrangle, forming a dissected and glaciated terrain with elevations as high as 2050 ft (625 m). The quadrangle is transected by two troughs that roughly parallel the east-west structural grain. The northern trough is occupied by Lake Merwin, an artificial reservoir inundating the valley of the Lewis River. The Lewis drains a large area in the southern Washington Cascade Range, including the southern flank of Mount St. Helens, approximately 20 km upstream from the quadrangle, before joining the Columbia River about 25 km west of the quadrangle (fig. 1). The southern trough, which includes Chelatchie Prairie and the lower stretch of Cedar Creek, probably marks a former course of the Lewis River.

The Amboy quadrangle lies east of the Portland Basin, which separates the Cascade Range from the Oregon Coast Range (fig. 1). The Portland Basin has been interpreted as a pull-apart basin located in the releasing stepover between two en echelon, northwest-striking, right-lateral fault zones (Beeson and others, 1985, 1989; Yelin and Patton, 1991; Blakely and others, 1995). These fault zones are thought to reflect regional transpression and dextral shear within the forearc in response to oblique subduction of the Pacific Plate (Pezzopane and Weldon, 1993; Wells and others, 1998). The southwestern margin of the Portland Basin is a well-defined topographic break along the base of the Tualatin Mountains, an asymmetric anticlinal ridge that is bounded on its northeast flank by the Portland Hills Fault Zone (Balsillie and Benson, 1971; Beeson and others, 1989; Blakely and others, 1995), which is probably an active structure (Wong and others, 2001; Liberty and others, 2003). The nature of the corresponding northeastern margin of the basin is less clear, but a poorly defined and partially buried dextral extensional structure has been inferred from topography, microseismicity, potential field-anomalies, and reconnaissance geologic mapping (Yelin and Patton, 1991; Beeson and others, 1989; Blakely and others, 1995).

This map is a contribution to a U.S. Geological Survey program designed to improve the geologic database for the Portland Basin region of the Pacific Northwest urban corridor, the densely populated forearc region of western Washington and Oregon. Better and more detailed information on the bedrock and surficial geology of the basin and its surrounding area is needed to refine assessments of seismic risk (Yelin and Patton, 1991; Bott and Wong, 1993), ground-failure hazards (Madin and Wang, 1999; Wegmann and Walsh, 2001) and resource availability in this rapidly growing region. The digital database for this publication is available on the World Wide Web at <http://pubs.usgs.gov/sim/2005/2885>.

PREVIOUS GEOLOGIC INVESTIGATIONS

Previous geologic mapping in the Amboy area, generally carried out as part of broad regional reconnaissance investigations, established the basic stratigraphic framework and distribution of geologic units in the quadrangle. The first systematic geologic work within the Amboy quadrangle was that of Mundorff (1964), who mapped the area south of the Lewis River to evaluate water resources in Clark County. He published a 1:48,000-scale geologic map and provided detailed descriptions of the basin-fill deposits. He later described the Pleistocene glacial deposits in the Lewis River valley, which he named the Amboy Drift (Mundorff, 1984).

Swanson and others (1993) updated Mundorff's (1964) Clark County work as part of an investigation of ground-water resources in the entire Portland Basin. Their work focused on the basin-fill units, and their map shows hydrogeologic rather than lithostratigraphic units, although there is substantial equivalence between the two. They analyzed lithologic logs of 1500 water wells to produce a set of maps that show the elevations and thicknesses of hydrogeologic units throughout the basin, thus constructing a 3-dimensional view of the subsurface stratigraphy of the basin fill.

Phillips (1987) compiled a 1:100,000-scale geologic map of the Vancouver 30'x60' quadrangle, which includes the Amboy 7.5' quadrangle, as part of the state geologic map program of the Washington Division of Geology and Earth Resources (Walsh and others, 1987). Although relying heavily on Mundorff's work, he did undertake some original reconnaissance mapping. Phillips was the first to depict the Mount St. Helens-derived deposits in the lower Lewis River valley. He also mapped major stratigraphic units within the Tertiary bedrock sequence and acquired chemical analyses for some of the volcanic rocks of the region as well as a few whole-rock K-Ar age determinations. However, none of these new data were obtained from the Amboy quadrangle.

14741_attachment

Topical geologic investigations in the Amboy quadrangle include those of Hyde (1975) and Major and Scott (1988), who described but did not map the Mount St. Helens-related deposits of the Lewis River valley, and Fiksdal (1975), who delineated several areas of potential slope instability in the quadrangle.

ACKNOWLEDGMENTS

Access granted by the many landowners was essential for mapping in the Amboy quadrangle. Robert Ross and Dennis Mohan of the Longview Fibre Company, Ross Graham and Dorothy Yount of Weyerhaeuser Company, and Ann Wikman and Brian Poehlein of the Washington Division of Natural Resources permitted work on their timberlands. Anna King, Richard Barney, and William Fields of PacifiCorp and Danny Walling of Lake Merwin Campers Hideaway permitted work on the lands adjacent to Lake Merwin. Diane M. Johnson of Washington State University performed chemical analyses and Robert Fleck of the U.S. Geological Survey provided ⁴⁰Ar/³⁹Ar ages. Bradley Reid, Zenon Valin, and Philip Dinterman gave able field assistance. Andrei Sarna-Wojcicki, Kenneth Bishop, Judith Fierstein, and Michael Clynne made available essential laboratory facilities. Water-well drillers' logs were examined in the offices of the Washington Department of Ecology Southwest Regional Office in Lacey, Wash., with the assistance of Stephanie Abraham and Tammy Howes. Connie Manson, librarian at the Washington Division of Geology and Earth Resources in Olympia, Wash., aided in obtaining information from that agency's files. I have benefited immensely from discussions on various aspects of the regional stratigraphy, structure, and geologic history of southwestern Washington with Roger Ashley, Michael Clynne, Paul Hammond, Keith Howard, Alan Niem, William Phillips, William Scott, James Smith, Donald Swanson, Karl Wegmann, and Ray Wells. Field and office consultations with Clynne were invaluable for interpreting Mount St. Helens-derived deposits. Detailed technical reviews by Clynne and Robert J. McLaughlin helped correct flaws and oversights in the original manuscript.

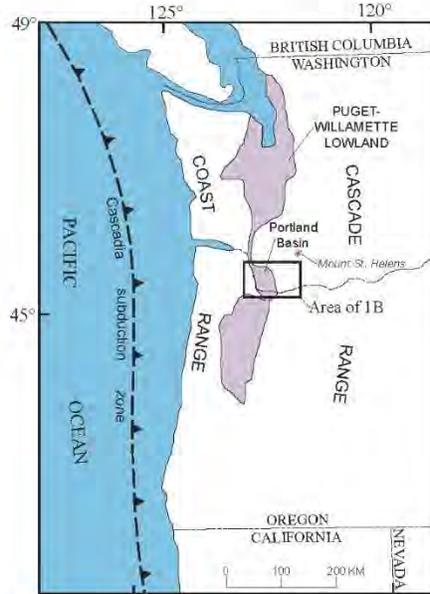


Figure 1A. Regional setting of the Amboy quadrangle showing major tectonic and physiographic features of the Pacific Northwest.

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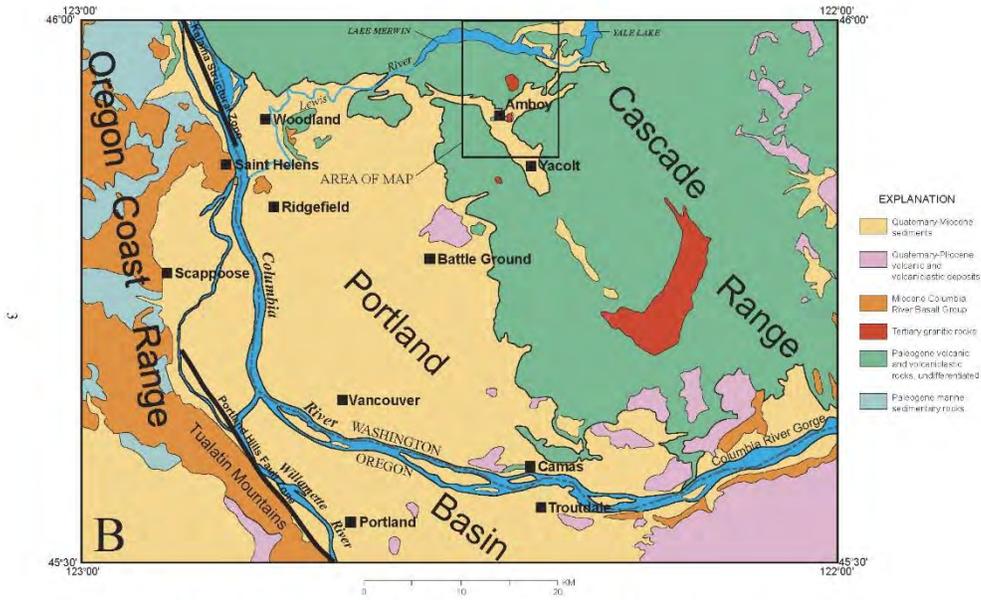


Figure 1B. Simplified geologic map of the Vancouver 30' x 60' quadrangle, modified from Phillips (1987a).

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SYNOPSIS OF GEOLOGY

Bedrock of the Amboy quadrangle consists of a diverse assemblage of late Eocene and earliest Oligocene volcanic and volcanoclastic rocks that comprise early products of the Cascade volcanic arc. These strata strike east-west to northeast and dip to the south and southeast at low angles, generally less than 25°; dips generally decrease to the south. They are intruded by several plug-like or sill-like bodies of diorite and quartz diorite. The east-northeast trend of Chelatchie Prairie and the north-northwest-trending reach of Cedar Creek reflect control by fault zones.

During the Pleistocene, mountain glaciers repeatedly formed in the Lewis River valley (Crandell and Miller, 1974; Mundorff, 1984) and extended downvalley as far as the map area. The largest glacier(s) covered virtually the entire quadrangle, leaving behind a smoothly sculpted topography of bedrock hills and valleys mantled by variable thicknesses of drift. As the glacier receded, outwash accumulated in the valleys of the Lewis River and Cedar and Chelatchie Creeks. In post-glacial time, eruptions at the Mount St. Helens volcanic center periodically deposited large amounts of volcanic debris into the Lewis River that was transported downstream as lahars and flood deposits (Hyde, 1975; Major and Scott, 1988).

Because of the extensive drift cover and dense vegetation of the region, outcrops of bedrock in the map area are generally limited to steep cliff faces, landslide scarps, and streambeds; many exposures are in roadcuts and quarries. The surface information was supplemented with lithologic data obtained from several hundred water-well reports in the files of the Washington Department of Ecology; well locations were taken as described in the reports and were not field checked, and only wells considered reliably located were used to infer the distribution and thicknesses of units in the subsurface.

PALEOGENE BEDROCK

Bedrock in the Amboy quadrangle consists of a diverse assortment of subaerially erupted lava flows and volcanoclastic rocks that are typical of the strata that underlie much of the western slopes of the southern Washington Cascade Range (Evarts and others, 1987; Smith, 1993; Evarts and Swanson, 1994). Bedrock strata in the quadrangle generally strike east-west to northeast and dip south to southeast low angles, generally less than 25°. They are intruded by several fine- to coarse-grained intrusions of intermediate composition. A few fine-grained mafic dikes cut the section north of Lake Merwin but are sparse compared to adjacent areas to the west (Evarts, 2004a, b). ⁴⁰Ar/³⁹Ar age determinations (R.J. Fleck, written commun., 2000, 2001, 2002) obtained for extrusive rocks within this and adjacent quadrangles indicate that the bedrock section exposed in the map area is mostly of late Eocene age, between 38 and 33 m.y. old, but the uppermost strata in the southern third of the map area are as young as 27 m.y. old (early Oligocene). Ages of the intrusions are unknown but most are believed to be no younger than early Miocene based on their relatively shallow emplacement depths and on regional magmatic history (Evarts and Swanson, 1994).

Lithostratigraphic nomenclature for the stratigraphically complex Tertiary volcanic rocks of the southern Washington Cascade Range is poorly developed. Formal names have been proposed for Paleogene volcanic strata in several widely scattered locations (Wilkinson and others, 1946; Snavely and others, 1958; Roberts, 1958; Trimble, 1963; Fiske and others, 1963). However, these formations have proven to be only locally important or to be so broadly defined as to be merely synonymous with Tertiary volcanic rocks (Evarts and others, 1987; Smith, 1993). Phillips (1987) assigned the Eocene rocks north of Green Mountain to the Goble Volcanics of Wilkinson and others (1946), but Evarts (2002) showed that the criteria employed by Phillips to correlate these rocks with those of the type area are unreliable. In order to show as much detail as possible without generating a proliferation of local lithostratigraphic units, this map portrays primarily lithologic rather than lithostratigraphic units, although informal lithostratigraphic names are used where appropriate.

VOLCANIC AND VOLCANICLASTIC ROCKS

Basaltic andesite, andesite, and basalt

Mafic to intermediate lava flows and flow breccia are major components of the Paleogene section of the Amboy quadrangle. Most are about 5 to 10 m thick but some are as thick as 70 m. They are characterized by blocky to platy (rarely columnar) jointed interiors that grade into upper and lower flow breccia zones. Abundant zeolite- and clay-filled vesicles and reddish colors owing to oxidation during cooling typify upper flow breccia zones. All flows were apparently emplaced subaerially; many rest on red paleosols developed on interflow sediments and no pillow lavas or other indications of subaqueous environments were observed. The flows range in texture from

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aphyric to densely porphyritic. Basaltic andesites (Tba and Tbem) typically contain phenocrysts of plagioclase, olivine, and augite in an intergranular to trachytic groundmass, whereas andesites contain phenocrysts of plagioclase, augite, and (or) hypersthene in an intersertal to pilotaxitic groundmass.

The basaltic andesite flows in the southern part of the map area (Tbem) are at the base of an extensive sequence of tholeiitic flows that extends about 65 km south to Camas (R.C. Evarts, unpub. mapping). This unit, informally named the basaltic andesite of Elkhorn Mountain, consists predominantly of plagioclase + olivine ± augite-phyric lavas; interbedded volcanoclastic rocks are generally sparse. $^{40}\text{Ar}/^{39}\text{Ar}$ ages of about 27 Ma were obtained from this unit in the Yacolt quadrangle to the south (R.J. Fleck, written commun., 2005). The basaltic andesite of Elkhorn Mountain is interpreted as a large mafic shield volcano, probably centered to the southeast of the map area. If this interpretation is correct, it implies that the base of the unit is an unconformity separating the 27-Ma basaltic andesite of Elkhorn Mountain from underlying strata that are about 33 m.y. old.

Basalt flows are uncommon in the Amboy quadrangle; two types are distinguished on this map. Isolated flows of aphyric and olivine+plagioclase-phyric basalt (Tb) crop out in the northern part of the quadrangle, low in the stratigraphic section. Flows of distinctive feldspar-free olivine-phyric basalt (Tob) are also largely restricted to the lower part of the Paleogene section. The olivine phenocrysts in these flows contain abundant euhedral inclusions of chromian spinel and, unlike those in other mafic rocks, are not completely altered. The lenticular unit, as thick as 150 m, that crops out on the steep north slope of Green Mountain consists largely of poorly sorted, indurated, brick-red scoria and likely represents a slice through the flank of a late Eocene cinder cone.

Dacite

Dacitic flows (Td) are dispersed throughout the upper part of the Paleogene stratigraphic section of the Amboy quadrangle. All are porphyritic pyroxene dacites similar to those found to the west (Evarts, 2004a, b).

Volcanoclastic rocks

Volcanoclastic rocks make up a substantial proportion of the Paleogene bedrock in the Amboy quadrangle. On this map they are divided into a unit of volcanoclastic sedimentary rocks of predominantly epiclastic origin (Tvs) and units comprised of mostly pyroclastic rocks (Tt and Tdpo). In addition, thin unmappable volcanoclastic beds commonly separate lava flows of units Ta, Tba, and Td. The volcanoclastic sedimentary rocks unit (Tvs) includes a diverse assemblage of generally well-bedded, texturally and compositionally immature siltstone, sandstone, conglomerate, and breccia. Fragments of volcanic rocks petrographically similar to interbedded lava flows are the dominant constituents of most beds; less abundant components include plagioclase, Fe-Ti oxides, and pyroxene crystals, pumice, vitric ash, fine-grained dioritic rocks, and plant remains. These beds include thin debris-flow and hyperconcentrated flood-flow (Smith, 1986) deposits as well as finer grained fluvial and lacustrine strata probably deposited beyond the flanks of volcanic edifices. In addition to material eroded from older extrusive rocks, these beds likely contain clasts reworked from unconsolidated penecontemporaneous airfall and ash-flow deposits.

The tuff unit (Tt) consists of andesitic to rhyolitic tuff, pumiceous and lithic lapilli tuff, and lithic tuff breccia that are inferred to be the direct products of explosive eruptions and volcanic debris flows. Most are medium to coarse grained, poorly sorted, matrix supported, and contain abundant originally vitric ash. Pumice-lapilli tuffs were presumably emplaced as pyroclastic flows, whereas more heterolithic, lithic-rich beds were probably deposited by lahars. Pumiceous tuffs north of Cedar Creek and Chelatchie Prairie tend to be weakly welded, sparsely phyric, and orange to brown, whereas those to the south are commonly densely welded and porphyritic. Phenocryst assemblages in most tuffs consist of plagioclase, augite, hypersthene, and Fe-Ti oxide; hornblende is very rare and no quartz or biotite were observed in any tuffs of this quadrangle. A densely welded and locally vitrophyric tuff (Tdpo) that crops out on the south side of Cedar Creek west of Amboy is believed to have been emplaced during a caldera-forming eruption in the Ariel quadrangle at about 35.1 Ma (Evarts, 2004b). Analysis of plagioclase from two welded tuffs at about the same stratigraphic position in the southern part of the map area yielded analytically indistinguishable $^{40}\text{Ar}/^{39}\text{Ar}$ ages of 33.4 ± 0.4 Ma and 33.0 ± 0.1 Ma (table 2).

INTRUSIVE ROCKS

In contrast to the adjacent Ariel quadrangle (Evarts, 2004b), fine-grained dikes are sparse in the Amboy quadrangle. They are found only in the lower part of the stratigraphic section near Lake Merwin. A 30-m-thick sill of strikingly plagioclase-phyric basalt forms a prominent cliff on the steep valley wall south of Speelyai Creek. This sill is petrographically and chemically similar to some flows in the Paleogene section north of the Amboy quadrangle (Evarts and Ashley, 1991). Several hypabyssal intrusions of mafic to intermediate composition are

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present south of Lake Merwin. The largest are sill-like bodies at Dunegan Mountain (T_{did}) and north of Buncombe Hollow Creek (T_{dib}) and a cylindrical body of fine- to medium-grained porphyritic diorite at the southwest end of Chelatchie Prairie (T_{dic}). The Dunegan Mountain intrusion is composed of relatively uniform medium-grained augite diorite in which feldspar is extensively replaced by stilbite. The long sill that crops out between Lake Merwin and Buncombe Hollow Creek is a composite body comprising several intrusions of porphyritic to seriate pyroxene diorite. Most of the smaller intrusions in the map area are sill-like bodies of relatively fine-grained diorite.

None of the intrusions has been radiometrically dated. The fine-grained dikes (T_{ib}, T_{iba}, T_{ia}) compositionally and texturally resemble their late Eocene host rocks and are probably not much younger. The coarse grain size of some of the larger intrusions is consistent with slow cooling at depth, which implies that they are considerably younger than the volcanic host rocks.

ROCK CHEMISTRY

The chemistry of Paleogene lava flows and intrusive rocks in the Amboy quadrangle (table 1) is generally similar to that of Tertiary igneous rocks sampled elsewhere in the southern Washington Cascade Range (Evarts and Ashley, 1990a,b, 1991, 1992; Evarts and Bishop, 1994; Evarts and Swanson, 1994; Evarts, 2001, 2002, 2004a, b; R.C. Evarts, unpub. data). Compositions of igneous rocks in the quadrangle range from basalt to high-silica dacite and form a low- to medium-potassium suite (fig. 2). Analyses straddle the dividing line between tholeiitic and calc-alkaline compositions using the classification of Miyashiro (1974; fig. 2C). TiO₂ contents of some basaltic andesites and andesites are as high as 2.25 wt percent, commonly greater than in rocks to the west (Evarts, 2004a, b) and somewhat higher than is typical for volcanic-arc magmas (Gill, 1981). Some basalts and a thick sill in the lower part of the section north of Lake Merwin contain relatively low contents of large-ion lithophile elements (K, Ba, Sr) and thus resemble low-potassium tholeiites of the basalt of Kalama River that crop out to the north in the Lakeview Peak quadrangle (Evarts and Ashley, 1991). Flows in the basaltic andesite of Elkhorn Mountain are tholeiitic (fig. 2C) and are generally higher in Fe and lower in K₂O (fig. 2B) than basaltic andesites elsewhere in the map area; most are relatively poor in Sr (table 1 and R.C. Evarts, unpub. data). Many flows in the Elkhorn Mountain unit are abundantly plagioclase-phyric, as reflected in Al₂O₃ contents greater than 19 wt percent (table 1), and probably accumulated excess feldspar in a subvolcanic magma chamber prior to eruption. No consistent

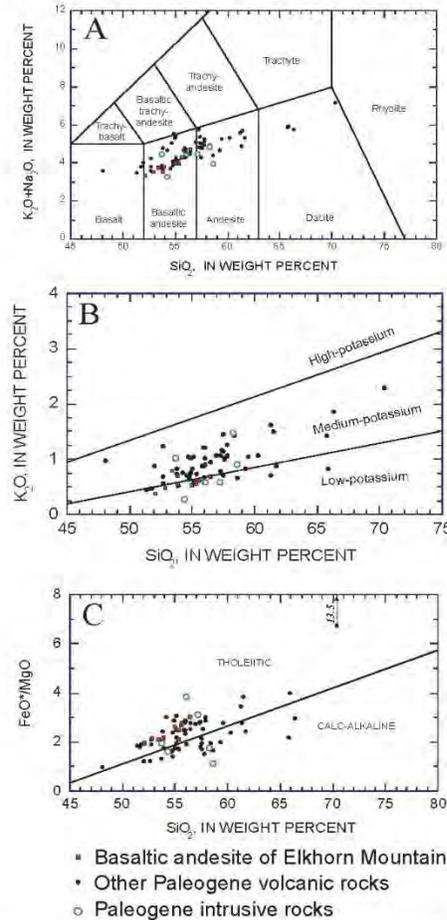


Figure 2. Chemical characteristics of volcanic rocks from the Amboy 7.5' quadrangle (analyses recalculated volatile-free). A, K₂O+Na₂O versus SiO₂ showing IUGS classification (Le Maitre, 2002); B, K₂O versus SiO₂ showing low-, medium-, and high-potassium fields extrapolated from Gill (1981, p. 6); C, FeO*/MgO versus SiO₂, showing classification into tholeiitic and calc-alkaline rocks according to Miyashiro (1974). FeO*, total Fe as FeO.

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present south of Lake Merwin. The largest are sill-like bodies at Dunegan Mountain (T_{6d}) and north of Buncombe Hollow Creek (T_{6b}) and a cylindrical body of fine- to medium-grained porphyritic diorite at the southwest end of Chelatchie Prairie (T_{6c}). The Dunegan Mountain intrusion is composed of relatively uniform medium-grained augite diorite in which feldspar is extensively replaced by stilbite. The long sill that crops out between Lake Merwin and Buncombe Hollow Creek is a composite body comprising several intrusions of porphyritic to seriate pyroxene diorite. Most of the smaller intrusions in the map area are sill-like bodies of relatively fine-grained diorite.

None of the intrusions has been radiometrically dated. The fine-grained dikes (T_{1b}, T_{1a}, T_{1a}) compositionally and texturally resemble their late Eocene host rocks and are probably not much younger. The coarse grain size of some of the larger intrusions is consistent with slow cooling at depth, which implies that they are considerably younger than the volcanic host rocks.

ROCK CHEMISTRY

The chemistry of Paleogene lava flows and intrusive rocks in the Amboy quadrangle (table 1) is generally similar to that of Tertiary igneous rocks sampled elsewhere in the southern Washington Cascade Range (Evarts and Ashley, 1990a,b, 1991, 1992; Evarts and Bishop, 1994; Evarts and Swanson, 1994; Evarts, 2001, 2002, 2004a, b; R.C. Evarts, unpub. data). Compositions of igneous rocks in the quadrangle range from basalt to high-silica dacite and form a low- to medium-potassium suite (fig. 2). Analyses straddle the dividing line between tholeiitic and calc-alkaline compositions using the classification of Miyashiro (1974; fig. 2C). TiO₂ contents of some basaltic andesites and andesites are as high as 2.25 wt percent, commonly greater than in rocks to the west (Evarts, 2004a, b) and somewhat higher than is typical for volcanic-arc magmas (Gill, 1981). Some basalts and a thick sill in the lower part of the section north of Lake Merwin contain relatively low contents of large-ion lithophile elements (K, Ba, Sr) and thus resemble low-potassium tholeiites of the basalt of Kalama River that crop out to the north in the Lakeview Peak quadrangle (Evarts and Ashley, 1991). Flows in the basaltic andesite of Elkhorn Mountain are tholeiitic (fig. 2C) and are generally higher in Fe and lower in K₂O (fig. 2B) than basaltic andesites elsewhere in the map area; most are relatively poor in Sr (table 1 and R.C. Evarts, unpub. data). Many flows in the Elkhorn Mountain unit are abundantly plagioclase-phyric, as reflected in Al₂O₃ contents greater than 19 wt percent (table 1), and probably accumulated excess feldspar in a subvolcanic magma chamber prior to eruption. No consistent

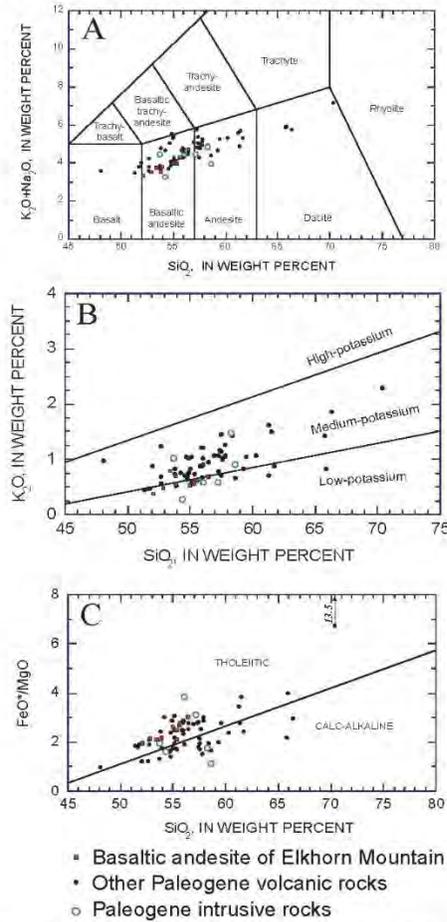


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chemical differences between eruptive and hypabyssal intrusive rocks are apparent (fig. 2).

METAMORPHISM AND HYDROTHERMAL ALTERATION

Paleogene rocks in the Amboy quadrangle have been subjected to zeolite-facies regional metamorphism, the general character of which is similar to that described from other areas in the southern Washington Cascade Range (Fiske and others, 1963; Wise, 1970; Evarts and others, 1987; Evarts and Swanson, 1994). This region-wide metamorphism reflects burial of the late Eocene and early Oligocene rocks by younger volcanic rocks within the relatively high-heat-flow environment of an active volcanic arc.

The extent of replacement of igneous minerals by secondary phases ranges from incipient to complete. Permeable, glass-rich, silicic volcanoclastic rocks are the most susceptible to zeolitization, whereas massive lava flows may be only slightly affected. In mafic to intermediate-composition lava flows, the primary effect of very-low-grade metamorphism is the nearly universal development of clay minerals and zeolites that replace labile interstitial glass, fill vesicles, and coat joint surfaces. Feldspar typically displays partial alteration to clay minerals and (or) zeolites. Olivine phenocrysts in most basalts and basaltic andesites are totally replaced by smectite with or without hematite and calcite; however, replacement is incomplete in some olivine-rich flows. Primary augite and Fe-Ti oxides are largely unaffected by the zeolite-facies metamorphism. Hypersthene phenocrysts in pyroxene andesite flows commonly exhibit minor replacement by dark brown smectite. In pervasively altered volcanoclastic rocks and flow breccias, smectitic clay minerals and zeolites pseudomorphically replace most framework grains and fill pore spaces; the development of iron-rich smectites gives these rocks their characteristic green colors. The widespread presence of heulandite and clinoptilolite in the volcanoclastic rocks of the map area indicates that, except for areas near intrusions, metamorphic temperatures did not exceed 180°C (Cho and others, 1987).

QUATERNARY DEPOSITS

The character of Quaternary sedimentation in the Amboy quadrangle has been shaped primarily by two processes: mountain glaciation and eruptions of the Mount St. Helens volcanic center. Alternating episodes of aggradation and incision have produced a complex series of terraces along the Lewis River.

GLACIAL AND RELATED DEPOSITS

Several times during the Pleistocene epoch, icecaps covered the Washington Cascade Range and spawned glaciers that moved down all of the major river valleys. From examinations of glacial deposits near Mount Rainier, Crandell and Miller (1974) inferred four major glacial episodes, each of which apparently consisted of several lesser advances and retreats (Dethier, 1988). The most widespread glacial deposits in the range are those related to the penultimate glaciation, the Hayden Creek Drift of Crandell and Miller (1974). Deeply weathered older deposits are locally preserved in the western Cascade foothills in areas beyond the reach of Hayden Creek glaciers. The last major glaciation in western Washington was the late Wisconsinan Fraser glaciation. Deposits of this age in the Cascade Range, named the Evans Creek Drift, are much less extensive than those of the Hayden Creek age (Crandell and Miller, 1974; Crandell, 1987). Widely distributed till and glaciofluvial sediments in the lower Lewis River valley were named the Amboy Drift by Mundorff (1984), who correlated them with the Hayden Creek Drift of the Mount Rainier region on the basis of similar weathering characteristics. Crandell (1987) noted that some of the till in Mundorff's (1984) Amboy Drift, however, was more deeply weathered than typical Hayden Creek Drift and suggested that the Amboy Drift as mapped by Mundorff (1964, 1984) includes some older drift (Crandell, 1987; see also Howard, 2002 and Evarts, 2004b). Most of the drift in the Amboy quadrangle appears to belong to the less weathered drift. It is therefore mapped as Amboy Drift and considered correlative with the Hayden Creek Drift of Crandell and Miller (1974). Some deposits are more deeply weathered, however, and are probably equivalent to the older drift noted by Crandell (1987).

Intensely weathered bouldery till and gravel (Qmt) are exposed near the southwest corner of the map area. They are correlated with similar deposits in the Ariel quadrangle that Evarts (2004b) mapped and informally named the drift of Mason Creek. These deposits are characterized by soil horizons more than 3 m thick and development of weathering rinds as thick as 1 cm or more on volcanic clasts. The area underlain by this drift is surrounded by the younger Amboy Drift. The younger Amboy-age glacier, which terminated about 3 km west of the quadrangle boundary, must have overridden this area, but it was apparently partially deflected by the bedrock ridge north of Maple Pit and thus unable to remove this patch of older drift. The age of the drift of Mason Creek is unknown.

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Crandell (1987) suggested that the till along Mason Creek may be slightly older than the type Wingate Hill Drift of Crandell and Miller (1974), estimated to be from 300 to 600 ka (Colman and Pierce, 1981; Dethier, 1988). To the west, the drift of Mason Creek contains clasts probably eroded from basaltic flows emplaced between 600 ka and 800 ka (Evarts, 2004b).

As described by Mundorff (1964, 1984), the Amboy Drift includes till, stratified drift, outwash, and ice-contact deposits. Excellent exposures are found at many places along the shores of Lake Merwin. An extensive blanket of Amboy Drift till (Qat) covers much of the quadrangle to elevations as high as 1860 ft (565 m). At its maximum extent, Amboy-age ice buried all of the map area except the summit of Green Mountain. The terrain south of Green Mountain exhibits a distinctive topography composed of streamlined bedrock-cored hills (rock drumlins) with thin till mantles. The hills consist of south-dipping lava flows and were sculpted as the ice moved westward, parallel to strike, and preferentially excavated less resistant volcanoclastic interbeds. Some till outcrops in the Lewis River valley contain minor but conspicuous clasts of light-colored, coarsely porphyritic dacite bearing phenocrysts of quartz, cummingtonite, and biotite; such clasts are particularly common in till north of the Lewis River. These rocks have chemical and mineralogical affinities with products of the ancestral volcanic center at Mount St. Helens, which is the only known source in the Lewis River drainage for the distinctive dacite.

Deposits of stratified sand and gravel underlie Chelatchie Prairie and form terrace assemblages in the Lewis River and Cedar Creek valleys. These deposits (Qao) locally overlie till. Clast compositions and weathering characteristics are similar to those of the till, and the sediments are interpreted as glaciofluvial outwash deposited during retreat of Lewis River glacier in late Pleistocene time. The outwash appears to represent at least three aggradational episodes during recession of the Amboy-age glacier. The oldest outwash is that with a surface elevation of about 720 ft (220 m) near the south boundary of the map area. These glaciofluvial deposits are at the north end of a broad, flat-bottomed, gently south-sloping valley, occupied by the town of Yacolt, that was apparently filled with outwash when glacial ice still occupied Chelatchie Prairie and terrain to the north. Chelatchie Prairie declines from about 600 ft (180 m) at its east end to about 400 ft (120 m) near Amboy and is the surface of a valley train, locally as thick as 66 m, that was deposited when the glacier had receded to near the site of Yale Dam east of the Amboy quadrangle. The outwash deposits near the east end of Lake Merwin are probably of the same age. At its western end the surface of Chelatchie Prairie is inset against an older fill with a surface about 12 to 15 m higher. This older fill continues westward as semicontinuous terraces along Cedar Creek all the way to its mouth (Evarts, 2004b); these deposits may be approximately the same age as those beneath Yacolt.

The lake deposits (Ql) near the southwest corner of the quadrangle mark the east end of a proglacial lake impounded by Amboy-age terminal moraines (Grigg and Whitlock, 2002; Evarts, 2004b).

The numerical ages of Hayden Creek Drift and its local equivalent, the Amboy Drift, are poorly known. Estimates range from 60 ka to greater than 300 ka (Crandell and Miller, 1974; Colman and Pierce, 1981; Dethier, 1988). A minimum age comes from evidence in the Fargher Lake area of the adjacent Ariel quadrangle (Grigg and Whitlock, 2002) that suggests ice last covered the map area during marine oxygen-isotope stage (MIS) 4 (74 to 60 ka; Martinson and others, 1987). This is consistent with the lack of Cougar-age (21,000 to 18,000 yrs B.P.; fig. 3) Mount St. Helens rocks in the drift and with the presence of Evans Creek-age moraines about 70 km upriver (Crandell, 1987).

As noted by Mundorff (1984), in many places the Amboy Drift is overlain by as much as 2 m of weathered yellowish-gray tephra. The tephra contains quartz, biotite and cummingtonite, and is mineralogically similar to tephra set C of Mullineaux (1996). Tephra set C was erupted from Mount St. Helens during the volcano's Ape Canyon eruptive stage, which extended from about 36,000 to 50,000 ^{14}C years B.P. (fig. 3); there is no other source known in the Cascade Range for tephra with this mineralogy. Crandell (1987) believed that all activity at the volcanic center postdated the Hayden Creek glaciation, which he correlated with MIS 4. However, clasts of quartz+biotite+cummingtonite-bearing dacite are widespread in the Amboy Drift, documenting preglacial or synglacial eruptive activity at the ancestral volcanic center. Furthermore, data for ash beds in eastern Washington (Berger and Busacca, 1995; Whitlock and others, 2000) as well as recent geochronologic work at Mount St. Helens (Evarts and others, 2003) indicate that eruptive activity at Mount St. Helens probably began well before 100 ka. Thus some of the quartz+biotite+cummingtonite-bearing tephra may be much older than 50 ka, and the underlying till could correlate with MIS 6, about 130 to 190 ka (Martinson and others, 1987), or an even older glacial period. At a locality on the crest of Green Mountain, quartz+biotite+cummingtonite-bearing tephra rests on weathered bedrock and is overlain by till. Plagioclase in this tephra yielded an $^{40}\text{Ar}/^{39}\text{Ar}$ age of 250 ± 36 ka (table 2), providing a maximum age for the peak of the Amboy/Hayden Creek glaciation. This is similar to the $^{40}\text{Ar}/^{39}\text{Ar}$ age of 270 ± 20 ka for syneruptive ice-contact deposits in the Ariel quadrangle, which were also deposited when the Amboy-age Lewis River glacier was near its maximum extent (Evarts and others, 2003; Evarts, 2004b). These ages suggest that the Hayden Creek glaciation in the southern Washington Cascade Range corresponds to MIS 8, about 245 to 300? ka

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(Martinson and others, 1987). It is possible, perhaps likely, that the deposits mapped here as Amboy Drift are diachronous and were actually deposited during more than one of the three glacial pulses of the Hayden Creek glaciation inferred by Dethier (1988) from an analysis of outwash-terrace deposits in the Cowlitz River valley, about 65 km north of the Amboy quadrangle.

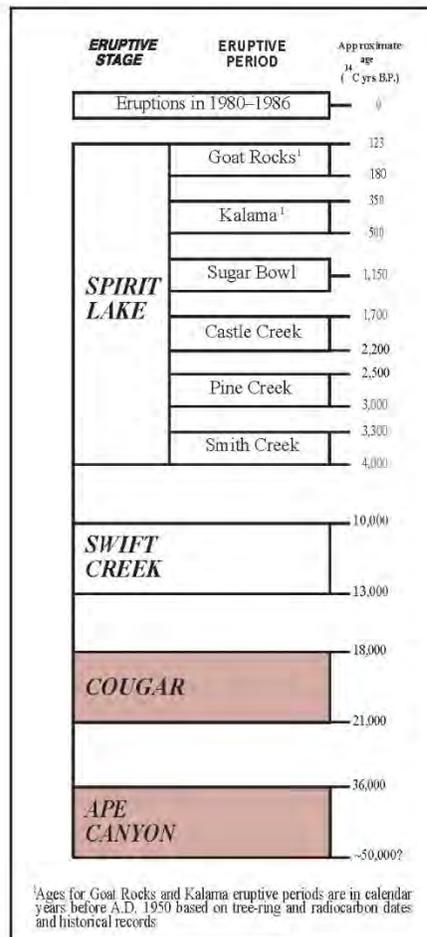


Figure 3. Eruptive stages and eruptive periods of Mount St. Helens volcano, modified from Crandell (1987). Shaded boxes designate stages corresponding to mapped deposits in the Amboy 7.5' quadrangle.

DEPOSITS DERIVED FROM THE MOUNT ST. HELENS VOLCANIC CENTER

The Lewis River drains the southern and eastern slopes of Mount St. Helens. Explosive eruptions at the volcanic center delivered large quantities of dacitic debris in the form of pyroclastic flows and lahars to the river during the late Pleistocene and Holocene (Crandell, 1987; Major and Scott, 1988). In postglacial time, eruptive activity at the volcano has been the dominant influence on sedimentation in the Lewis River valley. The periodic influx of volcanoclastic debris triggered major aggradational episodes downstream, and the deposits of these approximately syn-eruptive sedimentation events constitute a major part of the late Quaternary record in the lower Lewis River valley. Crandell (1987) showed that eruptive activity at Mount St. Helens was episodic and can be divided into several eruptive stages and periods (fig. 3). Based chiefly on their stratigraphic position and lithologic characteristics, Mount St. Helens-derived deposits in the Amboy quadrangle are assigned to Crandell's Ape Canyon and Cougar eruptive stages (fig. 3).

During the Ape Canyon eruptive stage, the Mount St. Helens volcanic center produced a distinctive white, coarsely porphyritic dacite containing phenocrysts of quartz and biotite (Crandell, 1987; Mullineaux, 1996). Major and Scott (1988) describe stratified, pumice-rich, alluvial sand and pebble gravel composed of this rock type (*Qsa*) from a narrow terrace along the north shore of Lake Merwin near Woodland Park. To the east, at the mouth of Rock Creek, a diamict that overlies west-dipping glaciofluvial beds contains boulders of quartz- and biotite-phyric dacite and may be a lahar deposit of about the same age as the alluvium. Poorly exposed Ape Canyon-age deposits also appear to underlie the dissected terrace surface at about 400 ft (120 m) elevation directly east of Lake Merwin. Sparse roadcut exposures show that these deposits include several meters of quartz- and biotite-bearing tephra as well as lithologically similar sandy alluvium. The scattered outcrops of Ape Canyon-age deposits indicate that during Ape Canyon time the lower Lewis River valley contained an extensive fill of volcanoclastic debris from the Mount St. Helens volcanic center.

Thick beds of sandy to gravelly alluvium and interbedded debris-flow deposits (*Qsc*) underlie a terrace surface inset into and about 15 m lower than that underlain by Ape Canyon-age deposits at the east end of Lake Merwin. Similar deposits underlie the valley of Speelyai Creek and form small terraces scattered along both shores of Lake Merwin farther west (Major and Scott, 1988; Everts, 2004b). In several places these deposits unconformably overlie Amboy Drift. The debris-flow beds are poorly sorted and heterolithologic, composed predominantly of light-colored porphyritic dacites like those erupted from ancestral Mount St. Helens as well as variable proportions of Tertiary volcanics. These deposits probably formed from lahars that incorporated alluvium during transport. Major and Scott (1988) inferred these deposits to be largely of Cougar age (21,000 to 18,000 ¹⁴C years B.P.), locally overlain by a few meters of Swift Creek-age (13,000 to 10,000 ¹⁴C years B.P.) beds. This inference was based on the degree of soil development, the presence of abundant clasts of dacite similar to that erupted during Crandell's Cougar eruptive stage, and an age of 22,720±1,400 ¹⁴C years B.P. that was obtained for charcoal in alluvium from the upper part of the Speelyai fill. Recent work by M.A. Clynne (written commun., 2003, 2004) indicates that clast compositions in the debris-flow beds are generally consistent with a Cougar age although some of these deposits could be older.

Few deposits younger than the Cougar eruptive stage have been identified in the Lewis River valley downstream from Mount St. Helens. A Swift Creek-age lahar is exposed below Merwin Dam in the Ariel quadrangle (Everts, 2004b) and alluvium with young (<1,000 years B.P.) radiocarbon ages is present near the mouth of the river at Woodland (Major and Scott, 1988). Extensive deposits of the Swift Creek and Spirit Lake eruptive stages (fig. 3) may underlie the submerged Lewis River floodplain beneath Lake Merwin.

LANDSLIDE, TALUS, AND ALLUVIAL DEPOSITS

Landslide (*Qls*) and talus deposits (*Qt*) are common beneath cliffs in the Amboy quadrangle. Notable accumulations of talus have formed below the glacially steepened north flanks of the east-west-trending cuestas of Green Mountain and the ridge south of Speelyai Creek and on the east side of Dunegan Mountain. Most landslides result from failure of weathered, clayey, Paleogene volcanoclastic rocks (*Tvs*, *Tt*, and sedimentary interbeds within flow-dominated units *Tba*, *Tbem*, and *Ta*). Younger poorly lithified deposits are also susceptible to sliding, especially on steeper slopes. Only the larger landslides are shown on this map; many areas underlain by unconsolidated Quaternary units contain small slumps and debris-flow deposits that are too small to portray at 1:24,000 scale.

Unconsolidated alluvium (*Qa*) forms local and ephemeral accumulations along the active courses of Speelyai and Cedar Creeks and small alluvial cones at the base of steep gullies on the north slope of Green Mountain. Some areas mapped as alluvium, such as along Buncombe Hollow Creek and near the southeast corner of

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the quadrangle, are the former channels of glacier-margin streams and these deposits are probably largely of Pleistocene age.

STRUCTURAL FEATURES

The Amboy quadrangle lies a few kilometers east of the northeastern margin of the Portland Basin, part of Puget-Willamette Lowland that separates the Cascade Range to the east from the Oregon and Washington Coast Ranges to the west. In the Cascade Range of southwestern Washington, structural attitudes of Paleogene strata delineate a set of large-wavelength, south- to southeast-plunging folds that are believed to have developed in late early Miocene time (Everts and Swanson, 1994). The late Eocene and Oligocene section in the northern part of the Amboy quadrangle, which generally strikes approximately east-west and dips south at 15 to 30°, is located on the west limb of one of these folds, the Lakeview Peak anticline of Phillips (1987). A poorly defined synclinal axis lies in the Ariel quadrangle to the west (Everts, 2004b). The Tertiary section flattens south of Cedar Creek, where dips are generally less than 15°, and is significantly disrupted by faulting near Chelatchie Prairie. In the southern part of the map area and to the south (R.C. Everts, unpub. mapping) the basaltic andesite of Elkhorn Mountain is nearly flat-lying. This suggests that a slight angular discordance (<10°) exists between this unit and underlying strata, possibly indicating minor folding during the approximately 6 m.y. hiatus represented by the unconformity at its base.

Owing to limited outcrop, compelling evidence for the existence of faults in the Amboy quadrangle is sparse. Some faults shown on this map are projected from structures observed in roadcuts or natural exposures. Others have been inferred from apparent discontinuities in distinctive stratigraphic units, from topographic lineaments, or from abrupt changes in bedding trends. Most appear to be minor high-angle normal and strike-slip or oblique-slip faults of the kind characteristic of southwestern Washington (Wells, 1981; Wells and Coe, 1985; Everts and Ashley, 1991, 1992; Everts and Swanson, 1994; Everts, 2002, 2004a, b; R.C. Everts, unpub. mapping). Collectively, these structures presumably accommodated the paleomagnetically recorded rotations of small crustal blocks in response to long-term oblique convergence along the Cascadia Subduction Zone throughout Cenozoic time (Wells and Coe, 1985; Wells, 1989, 1990; Beck and Burr, 1979; Bates and others, 1981; Hagstrum and others, 1999).

As suggested by Mundorff (1964), major fault zones appear to be responsible for the northeast-striking basin of Chelatchie Prairie and the north-northwest-trending reach of Cedar Creek. The north-northwest-striking faults in the Cedar Creek area are inferred to be right-lateral structures based on apparent dextral offset of Paleogene strata. South of the map area, these faults exhibit normal offsets that partly define the edges of the basin in which the town of Yacolt is situated. North of these faults, the dominant fault trend in the quadrangle is northeasterly. The most prominent northeast-striking faults are those that control Chelatchie Prairie. Tertiary rocks that form the elongate knobs near Chelatchie strike almost north-south and appear to have been rotated several tens of degrees counterclockwise relative to strata that flank the basin. The knobs are interpreted as small blocks rotated along short subsidiary fault segments between longer left-lateral faults that transect and bound the basin. The basin itself evidently was formed by north-side-down normal offset on the faults that run along its southern boundary. Relief in this area is about 200 m but actual offset is unknown; it may be less than this because the basin was probably deepened by glacial erosion.

The age of the faulting is poorly constrained and movement may have occurred intermittently throughout late Cenozoic time. Zeolite- and quartz-filled fault planes and rusty pyritic rock in Cedar Creek south of Amboy presumably reflect reaction with heated geothermal fluids and indicate that some faulting probably occurred prior to the Miocene cessation of volcanic activity in the area. On the other hand, the major north-northwest and east-southeast striking fault zones are well expressed in the topography, suggesting that they are relatively young, possibly Quaternary structures. The relationship between these faults is unclear, but the north-northwest-striking faults that mark the abrupt west end of Chelatchie Prairie probably truncate the east-northeast faults. Chelatchie Prairie appears to be an oblique extensional feature formed in response to dextral motion on the north-northwest faults and associated clockwise rotation of the terrain to the west.

GEOLOGIC EVOLUTION

The late Eocene and early Oligocene bedrock in the Amboy quadrangle consists of sheetlike mafic to intermediate lava flows interbedded with coarse-grained breccias, pumiceous pyroclastic rocks, and stratified volcanoclastic sedimentary rocks and cut by scattered phaneritic intrusions. These bedrock units are typical of the

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southern Washington Cascade Range (Evarts and Swanson, 1994). The dearth of dikes and areas of hydrothermal alteration in the map area suggests deposition largely in medial to distal settings beyond the flanks of large active volcanic edifices (Williams and McBirney, 1979; Vessell and Davies, 1981; Cas and Wright, 1987; Orton, 1996). Small silicic centers, however, may be marked by dacitic flows such as the one at Maple Pit, which are too viscous to flow far from source vents, and the wedge-like deposit of scoriaceous olivine-phyric basalt on the north flank of Green Mountain is probably a cross section through the flank of a small cinder cone. Also, the intrusions of diorite and quartz diorite at Buncombe Hollow, Dunegan Mountain and, elsewhere may represent subvolcanic magma chambers that fed now-eroded volcanoes. Age determinations in this and adjacent quadrangles (Evarts, 2002, 2004b; R.J. Fleck, written commun., 2000, 2001, 2002, 2005) show that the extrusive rocks here were emplaced mainly between 37 and 33 Ma, early in Cascade arc history (Duncan and Kulm, 1989; Evarts and Swanson, 1994). The uppermost unit in the map area, the basaltic andesite of Elkhorn Mountain, unconformably overlies the older strata and is about 27 m.y. old, indicating a hiatus in volcanism lasting perhaps as long as 6 m.y.; minor folding may have occurred during this time. Whether the event recorded by this hiatus was of regional or simply local extent is unknown, but generally the volcanic arc in Washington remained the site of vigorous volcanic activity into early Miocene time (Evarts and others, 1987; Vance and others, 1980; Smith, 1993). A precipitous decline in volcanism after about 17 Ma in southern Washington corresponds to a region-wide episode of uplift, folding, and erosion (Evarts and Swanson, 1994) and southward tilting of strata in the Amboy quadrangle probably occurred at this time.

Regionally distributed minor faults are believed to accommodate the deformation of crustal blocks that is recorded by clockwise-rotated paleomagnetic declinations in Paleogene rocks in southwestern Washington; this deformation is interpreted as a response to oblique convergence along the Cascadia Subduction Zone (Wells and Coe, 1985; Wells, 1989, 1990; Beck and Burr, 1979; Bates and others, 1981; Hagstrum and others, 1999). In the Amboy quadrangle, this deformation appears to have become concentrated along more discrete north-northwest- and east-northeast-trending fault zones. The NNW fault zone is most likely a dextral structure, one of a set along which western Washington has moved northward relative to interior North America (Wells and others, 1998). Chelatchie Prairie appears to be an extensional basin developed between antithetic oblique-slip faults with sinistral offset. It may have formed in a releasing stepover between the right-lateral fault zone near Amboy and a similar structure in the unmapped area east of the Amboy quadrangle; small blocks between the fault strands that bound Chelatchie Prairie have been rotated counterclockwise by left-lateral movement on these structures. The topographic expression of these faults suggests they are relatively young. The north-northwest-striking fault zone is parallel to the St. Helens Seismic Zone (SHZ) of Weaver and others (1987) beneath Mount St. Helens and thus is appropriately oriented for dextral strike-slip motion, as inferred for the SHZ, in the modern regional stress field (Pezzopane and Weldon, 1993; Wells and others, 1998; Miller and others, 2001).

The Quaternary geologic history recorded in the Amboy quadrangle reflects two dominating influences: Pleistocene glaciation and eruptions at the Mount St. Helens volcanic center, both of which caused alternating periods of alluviation and downcutting in the Lewis River valley in response to large variations in sediment load (Mundorff, 1984; Major and Scott, 1988). The modern topography owes much of its character to glacial sculpting.

Several times during the Pleistocene, mountain glaciers moved out of the Cascade Range and into the map area. Evidence for earlier glacial advances was erased by the glaciation that deposited the Amboy Drift, the local equivalent of the Hayden Creek Drift. During Amboy time, a large piedmont glacier issued from the Lewis River valley and spread out to bury the map area (Mundorff, 1984); at the glacier's maximum extent, only the summit of Green Mountain above about 1850 ft (565 m) projected above the ice. Evidence in the Ariel quadrangle (Evarts, 2004b) suggests that the Amboy Drift may include deposits of more than one glacial pulse during the Hayden Creek Stade, with the maximum advance occurring at about 270 ka. The most recent glaciation in the Cascade Range, which culminated about 17,000 ¹⁴C years B.P. (Barnosky, 1984), was considerably less extensive than the Hayden Creek (Amboy) advance, and left no identified deposits in the lower Lewis River valley.

The Amboy-age glacier widened the valleys now occupied by Lake Merwin and Speelyai Creek and carved numerous streamlined knobs and ridges (rock drumlins) in the south part of the map area. The orientations of these features reflect the interplay between the west to south-southwest directions of ice movement and attitudes in the Paleogene bedrock; preferential excavation of volcanoclastic beds left elongated ridges upheld by lava flows. Prominent cuestas were produced in the south-dipping strata of Green Mountain and the ridge south of Speelyai Creek, and overdeepened troughs were carved in Chelatchie Prairie, Cedar Creek valley northwest of Amboy, and possibly the Lewis River valley. Glacial retreat was interrupted by multiple partial readvances, and proglacial drainage continually adjusted to changing position of ice margins. The bench now occupied by Buncombe Hollow Creek was probably eroded by a glacier-margin stream, as were several smaller drainages south of Chelatchie Prairie. Underfit streams such as Speelyai Creek, Chelatchie Creek, and Cedar Creek downstream from Amboy imply that significant rearrangements of stream courses took place during deglaciation. Mundorff (1984) suggested

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that Canyon Creek, a large tributary that enters the Lewis River east of the map area, flowed approximately along the present course of Chelatchie Creek and westward along the modern Cedar Creek valley in preglacial times. The Lewis River may also have at times spilled into Chelatchie Prairie via the northeast-trending saddles north of Chelatchie. As the Amboy glacier retreated, proglacial outwash was deposited in the deglaciated valleys. Remnants of valley trains deposited when ice occupied Chelatchie Prairie are preserved as terraces along Cedar Creek and as a south-sloping fill in the Yacolt quadrangle to the south. The southwest-trending reach of Cedar Creek in the southeast part of the Amboy quadrangle probably drained southward to join the East Fork Lewis River at this time before being captured by headward erosion of lower Cedar Creek south of Amboy. Chelatchie Prairie itself filled with outwash when the glacier retreated farther upvalley.

The volcanic center at Mount St. Helens first became active at some time before or during the Amboy glaciation and has erupted frequently since (Crandell, 1987). At least one eruption occurred at a time when the Lewis River valley was filled with ice (Evarts, 2004b). Many of these eruptions were explosive, and some dumped huge quantities of pyroclastic debris into the Lewis River system. Evidence for periods of eruption-induced aggradation and subsequent incision is abundant in the Amboy quadrangle (Major and Scott, 1988). Most of the deposits of Mount St. Helens origin preserved within the quadrangle were deposited by lahars or reworked from primary eruptive deposits upstream. They postdate the Amboy Drift, and were largely deposited during the Ape Canyon, Cougar, and Swift Creek eruptive stages of Crandell (1987), between about 50,000 and 10,000 ¹⁴C years B.P. (fig. 3) although younger deposits may underlie the submerged floodplain of the river. Thick fills of Mount St. Helens-derived debris in the valley of Speelyai Creek and the Lewis River valley east of Lake Merwin were probably emplaced during a major lahar-induced aggradational episode during the Cougar eruptive stage (Hyde, 1975; Major and Scott, 1988). Prior to Cougar time, the Lewis River may have flowed through the valley now occupied by Speelyai Creek, and was diverted southward to its present course when that valley became choked with volcaniclastic sediment, as suggested by Major and Scott (1988).

GEOLOGIC RESOURCES

Known geologic resources available in the Amboy quadrangle are limited to nonmetallic industrial materials, chiefly aggregate for road construction and similar purposes. Several large quarries in Paleogene volcanic and intrusive bedrock of the map area produce crushed aggregate used primarily as base and surface material for roads. Sand and gravel are locally available from unconsolidated alluvial deposits along the Lewis River but are more abundant and accessible downstream from the map area.

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Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle

[X-ray fluorescence analyses. Rock-type names assigned in accordance with IUGS system (Le Maitre, 2002) applied to recalculated analyses. FeO*, total iron calculated as FeO. Mg#, atomic ratio 100Mg/(Mg+Fe²⁺) with Fe²⁺ set to 0.85x Fe^{total}. Modal analyses, secondary minerals counted as primary mineral replaced. -, not present. X-ray fluorescence analyses by D.M. Johnson at GeoAnalytical Laboratory of Washington State University using methods described in Johnson and others (1999)]

Map No.	1	2	3	4	5	6	7	8	9
Field sample No.	02YC-P466	99YC-P68	99YC-P41A	99YC-P58	99YC-P95A	99YC-P59	00YC-P129C	00YC-P210	00YC-P164
Latitude (N)	45°57.94'	45°57.84'	45°59.46'	45°59.10'	45°57.84'	45°57.10'	45°53.76'	45°53.52'	45°52.86'
Longitude (W)	122°25.19'	122°27.12'	122°28.02'	122°23.34'	122°27.30'	122°22.80'	122°23.22'	122°23.40'	122°22.86'
Map unit	Tob	Tob	Tb	Tb	Tb	Tppb	Tbem	Tbem	Tbem
Rock type	Basalt	Basaltic andesite	Basalt	Basalt	Basalt	Basalt	Basaltic andesite	Basaltic andesite	Basaltic andesite
Analyses as reported (wt percent)									
SiO ₂	47.34	52.62	51.16	51.25	51.74	50.58	52.16	52.46	53.33
TiO ₂	1.78	1.28	1.74	1.78	1.33	1.61	1.24	1.39	1.36
Al ₂ O ₃	15.53	16.53	15.35	15.33	17.30	16.35	19.39	17.87	17.25
FeO*	9.93	8.90	10.68	10.83	8.49	10.20	8.63	9.69	9.60
MnO	0.17	0.15	0.19	0.21	0.17	0.18	0.16	0.18	0.17
MgO	9.48	7.11	5.66	5.59	6.62	5.30	4.33	4.42	4.44
CaO	10.30	9.54	10.26	10.09	9.71	10.67	10.74	9.63	9.85
Na ₂ O	2.59	2.91	3.28	3.29	3.15	3.00	2.91	3.06	2.97
K ₂ O	0.97	0.70	0.49	0.49	0.88	0.45	0.38	0.48	0.78
P ₂ O ₅	0.47	0.27	0.24	0.25	0.28	0.21	0.16	0.19	0.19
Total	98.56	100.01	99.05	99.11	99.67	98.55	100.10	99.37	99.94
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	48.03	52.61	51.65	51.71	51.91	51.32	52.11	52.79	53.36
TiO ₂	1.81	1.28	1.76	1.80	1.33	1.63	1.24	1.40	1.36
Al ₂ O ₃	15.76	16.53	15.50	15.47	17.36	16.59	19.37	17.98	17.26
FeO*	10.08	8.90	10.78	10.93	8.52	10.35	8.62	9.75	9.61
MnO	0.17	0.15	0.19	0.21	0.17	0.18	0.16	0.18	0.17
MgO	9.62	7.11	5.71	5.64	6.64	5.38	4.33	4.45	4.44
CaO	10.45	9.54	10.36	10.18	9.74	10.83	10.73	9.69	9.86
Na ₂ O	2.63	2.91	3.31	3.32	3.16	3.04	2.91	3.08	2.97
K ₂ O	0.98	0.70	0.49	0.49	0.88	0.46	0.38	0.48	0.78
P ₂ O ₅	0.48	0.27	0.24	0.25	0.28	0.21	0.16	0.19	0.19
Mg#	66.7	62.6	52.6	52.0	62.1	52.1	51.3	48.9	49.2
Modes (volume percent)									
Plagioclase	-	0.3	-	-	1.1	16.2	26.8	21.9	14.0
Clinopyroxene	-	0.1	-	-	0.2	-	trace	0.3	1.3
Orthopyroxene	-	-	-	-	-	-	-	-	-
Olivine	9.3	7.0	-	-	2.3	0.3	0.1	2.8	0.6
Fe-Ti Oxide	-	-	-	-	trace	-	-	-	-
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	90.7	92.6	100.0	100.0	96.4	83.5	73.1	75.0	84.1
No. points counted	788	718			726	750	800	795	766
Texture (rock/groundmass)	porphyritic/trachytic	porphyritic/trachytic	aphyric/intergranular	aphyric/intergranular	sparsely phyrlic/trachytic	porphyritic/intergranular	porphyritic/trachytic	seriate/trachytic	seriate/microgranular
Trace element analyses (ppm)									
Ba	264	161	125	126	169	102	134	137	173
Rb	23	7	8	5	14	3	4	5	23
Sr	410	435	270	262	431	283	341	311	289
Y	23	22	32	34	23	29	21	25	30
Zr	177	145	123	129	144	113	95	100	132
Nb	16.4	10.7	9.9	10.0	11.7	9.2	5.9	7.1	8.8
Ni	193	149	28	32	97	38	20	11	13
Cu	100	133	151	151	114	141	125	152	165
Zn	80	80	88	90	78	87	73	81	75
Cr	403	258	66	67	155	70	45	48	52

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Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	10	11	12	13	14	15	16	17	18
Field sample No.	00YC-P128A	00YC-P167	00YC-P98	00YC-P101	00YC-P209	01YC-P230	01YC-P215B	01YC-P225	01YC-P215A
Latitude (N)	45°54.00'	45°52.62'	45°53.10'	45°54.12'	45°52.92'	45°53.10'	45°53.04'	45°52.98'	45°53.10'
Longitude (W)	122°22.50'	122°22.62'	122°27.72'	122°24.30'	122°23.58'	122°26.58'	122°28.74'	122°29.22'	122°28.74'
Map unit	Tbern	Tbern	Tbern	Tbern	Tbern	Tbern	Tbern	Tbern	Tbern
Rock type	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite
Analyses as reported (wt percent)									
SiO ₂	53.52	53.73	54.74	54.89	55.43	55.02	55.20	55.23	56.16
TiO ₂	1.67	1.67	1.16	1.20	1.22	1.12	1.12	1.18	1.59
Al ₂ O ₃	15.92	16.15	20.12	19.08	17.68	19.58	19.37	19.13	16.37
FeO*	10.33	10.14	7.20	7.87	8.91	7.24	7.49	7.35	9.70
MnO	0.20	0.18	0.15	0.16	0.17	0.16	0.18	0.18	0.21
MgO	4.63	4.58	2.68	3.10	4.16	2.66	2.65	2.58	3.18
CaO	9.42	9.32	9.44	8.79	8.49	8.91	8.76	8.67	7.46
Na ₂ O	2.97	3.11	3.46	3.44	3.43	3.67	3.65	3.62	4.01
K ₂ O	0.54	0.69	0.52	0.58	0.54	0.60	0.62	0.65	0.70
P ₂ O ₅	0.24	0.24	0.19	0.19	0.17	0.18	0.18	0.18	0.23
Total	99.44	99.81	99.66	99.30	100.20	99.14	99.22	98.77	99.61
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	53.82	53.83	54.93	55.28	55.32	55.50	55.64	55.92	56.38
TiO ₂	1.68	1.67	1.17	1.21	1.22	1.13	1.13	1.19	1.60
Al ₂ O ₃	16.01	16.18	20.19	19.22	17.65	19.75	19.52	19.37	16.43
FeO*	10.39	10.16	7.23	7.93	8.89	7.30	7.55	7.44	9.74
MnO	0.20	0.18	0.15	0.16	0.17	0.16	0.18	0.18	0.21
MgO	4.66	4.59	2.69	3.12	4.15	2.68	2.67	2.61	3.19
CaO	9.47	9.34	9.47	8.85	8.47	8.99	8.83	8.78	7.49
Na ₂ O	2.99	3.12	3.47	3.46	3.42	3.70	3.68	3.67	4.03
K ₂ O	0.54	0.69	0.52	0.58	0.54	0.61	0.62	0.66	0.70
P ₂ O ₅	0.24	0.24	0.19	0.19	0.17	0.18	0.18	0.18	0.23
Mg#	48.4	48.6	43.8	45.3	49.5	43.5	42.6	42.4	40.7
Modes (volume percent)									
Plagioclase	3.7	3.5	40.9	44.3	28.3	29.8	28.5	8.5	8.5
Clinopyroxene	-	-	1.1	1.8	0.4	0.9	1.6	1.5	1.5
Orthopyroxene	-	-	-	-	1.5	-	-	-	-
Olivine	0.6	0.3	0.7	2.6	0.2	1.3	1.0	0.6	0.6
Fe-Ti Oxide	-	-	0.1	0.2	trace	0.1	0.4	0.3	0.3
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	95.7	96.2	57.2	51.1	69.6	67.9	68.5	89.1	89.1
No. points counted	771	733	736	810	792	775	796	786	786
Texture (rock/ groundmass)	seriate/ trachytic	seriate/ trachytic	seriate/ intergranular	porphyritic/ intergranular	seriate/ intergranular	seriate/ intergranular	seriate/ intergranular	seriate/ intergranular	seriate/ intergranular
Trace element analyses (ppm)									
Ba	200	219	143	155	155	151	154	147	147
Rb	8	14	8	11	8	11	14	16	16
Sr	280	275	334	320	326	325	324	272	272
Y	31	31	26	25	23	24	29	33	33
Zr	140	142	108	115	93	112	111	135	135
Nb	8.2	9.0	8.7	8.6	6.8	8.8	8.3	10.5	10.5
Ni	20	16	3	8	12	2	3	3	3
Cu	221	174	49	94	107	114	107	171	171
Zn	90	94	72	79	76	78	75	103	103
Cr	54	55	9	20	36	10	12	10	10

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Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	19	20	21	22	23	24	25	26	27
Field sample No.	00YC-P131A	01YC-P288	99YC-P61	01YC-P293	01YC-P351	99YC-P54	99YC-P29	99YC-P22 ¹	99YC-P88
Latitude (N)	45°55.80'	45°58.44'	45°58.02'	45°58.56'	45°52.62'	45°58.92'	45°53.64'	45°59.58'	45°57.06'
Longitude (W)	122°26.40'	122°24.06'	122°29.82'	122°23.88'	122°24.60'	122°23.58'	122°29.76'	122°25.02'	122°27.18'
Map unit	Tbom	Tba	Tba	Tba	Tba	Tba	Tba	Tba	Tba
Rock type	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite
Analyses as reported (wt percent)									
SiO ₂	52.20	52.27	53.43	53.51	53.46	53.82	54.16	54.05	54.61
TiO ₂	1.61	0.98	0.90	2.11	1.09	2.13	0.94	1.70	1.15
Al ₂ O ₃	16.96	20.45	18.79	15.79	18.37	15.51	17.77	18.08	17.38
FeO*	9.16	7.72	7.19	10.47	8.32	11.15	8.09	8.01	7.97
MnO	0.16	0.15	0.14	0.22	0.18	0.17	0.15	0.13	0.30
MgO	4.69	3.60	5.17	4.17	4.53	3.61	4.92	3.28	4.72
CaO	9.86	10.15	9.95	8.12	9.55	8.01	9.44	8.29	9.67
Na ₂ O	2.98	3.21	3.08	3.93	3.15	3.87	2.97	3.96	3.16
K ₂ O	1.23	0.57	0.75	0.84	0.52	0.77	0.71	1.04	0.71
P ₂ O ₅	0.30	0.14	0.13	0.37	0.15	0.34	0.14	0.35	0.19
Total	99.15	99.24	99.53	99.53	99.32	99.38	99.29	98.89	99.86
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	52.65	52.67	53.68	53.76	53.82	54.16	54.55	54.66	54.72
TiO ₂	1.62	0.99	0.90	2.12	1.10	2.14	0.95	1.72	1.32
Al ₂ O ₃	17.11	20.61	18.88	15.87	18.50	15.61	17.90	18.28	16.96
FeO*	9.24	7.78	7.22	10.52	8.38	11.22	8.15	8.10	8.03
MnO	0.16	0.16	0.14	0.22	0.19	0.17	0.15	0.13	0.15
MgO	4.73	3.63	5.19	4.19	4.56	3.63	4.96	3.32	5.57
CaO	9.94	10.23	10.00	8.16	9.61	8.06	9.51	8.38	8.90
Na ₂ O	3.01	3.23	3.09	3.95	3.17	3.89	2.99	4.00	3.43
K ₂ O	1.24	0.57	0.75	0.84	0.52	0.77	0.72	1.05	0.65
P ₂ O ₅	0.30	0.14	0.13	0.37	0.15	0.35	0.14	0.35	0.28
Mg#	51.8	49.4	60.1	45.5	53.3	40.4	56.0	46.2	59.3
Modes (volume percent)									
Plagioclase	14.4	37.6	16.3	-	29.6	-	26.5	38.7	10.1
Clinopyroxene	1.9	-	-	-	0.8	-	4.7	-	0.8
Orthopyroxene	-	-	-	-	0.1	-	0.5	0.3	0.4
Olivine	2.2	0.3	1.6	-	3.6	-	2.8	0.5	1.4
Fe-Ti Oxide	0.1	-	-	-	-	-	-	-	0.4
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	81.4	62.1	82.1	100.0	65.9	100.0	65.5	60.5	86.9
No. points counted	742	747	774		753		784	782	760
Texture (rock/ groundmass)	porphyritic/ trachytic	porphyritic/ intergranular	seriate/ intergranular	aphyric/ trachytic	seriate/ intergranular	aphyric/ interstitial	seriate/ intergranular	porphyritic/ intergranular	seriate/ intergranular
Trace element analyses (ppm)									
Ba	563	141	139	203	121	194	137	224	212
Rb	18	12	13	12	10	11	13	15	9
Sr	599	312	397	363	292	404	322	404	378
Y	33	20	18	31	22	33	18	32	24
Zr	179	91	111	155	97	156	100	198	167
Nb	10.2	6.1	7.2	13.7	6.6	12.6	5.6	16.5	13.6
Ni	36	14	49	10	16	3	28	35	64
Cu	77	94	43	140	63	39	88	99	100
Zn	85	73	61	98	84	104	73	89	71
Cr	56	20	106	16	35	19	67	49	110

¹ float

14741_attachment

Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	28	29	30	31	32	33	34	35	36
Field sample No.	98YC-P09	99YC-P35	99YC-P11A	00YC-P171	98YC-P04	83YC-P01E	99YC-P93	99YC-P86	99YC-P82A
Latitude (N)	45°58.98'	45°57.42'	45°55.98'	45°55.08'	45°59.28'	45°59.28'	45°57.90'	45°55.74'	45°56.28'
Longitude (W)	122°26.52'	122°28.68'	122°22.68'	122°22.86'	122°26.16'	122°25.14'	122°28.32'	122°28.74'	122°25.32'
Map unit	Tba	Tba	Tba	Tba	Tba	Tba	Tba	Tba	Tba
Rock type	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite
Analyses as reported (wt percent)									
SiO ₂	54.08	54.71	54.66	54.44	54.38	54.63	55.48	55.51	55.47
TiO ₂	2.20	1.05	1.31	1.23	2.23	2.01	1.07	1.78	1.60
Al ₂ O ₃	15.68	17.57	17.89	17.71	15.66	15.36	18.07	15.72	16.09
FeO*	10.11	8.01	8.77	8.38	10.30	9.72	7.75	9.91	9.45
MnO	0.20	0.15	0.16	0.16	0.19	0.17	0.15	0.21	0.16
MgO	3.45	4.49	3.46	4.19	3.27	4.32	4.42	3.92	3.96
CaO	6.93	9.42	8.80	8.56	6.85	8.41	9.12	7.57	7.66
Na ₂ O	4.44	3.34	3.28	3.50	4.35	3.65	3.40	3.79	3.78
K ₂ O	1.02	0.76	0.83	0.58	1.04	0.59	0.75	0.89	0.88
P ₂ O ₅	0.53	0.16	0.21	0.19	0.53	0.38	0.17	0.26	0.26
Total	98.64	99.66	99.37	98.94	98.80	99.24	100.38	99.56	99.31
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	54.83	54.90	55.01	55.03	55.04	55.05	55.27	55.76	55.86
TiO ₂	2.23	1.06	1.32	1.24	2.26	2.03	1.07	1.78	1.61
Al ₂ O ₃	15.90	17.63	18.00	17.90	15.85	15.48	18.00	15.79	16.20
FeO*	10.25	8.04	8.82	8.47	10.43	9.79	7.72	9.96	9.52
MnO	0.21	0.15	0.16	0.16	0.19	0.17	0.15	0.21	0.16
MgO	3.50	4.51	3.48	4.24	3.31	4.35	4.40	3.94	3.99
CaO	7.03	9.45	8.86	8.65	6.93	8.47	9.09	7.60	7.71
Na ₂ O	4.50	3.35	3.30	3.54	4.40	3.68	3.39	3.81	3.81
K ₂ O	1.03	0.76	0.84	0.59	1.05	0.59	0.75	0.89	0.89
P ₂ O ₅	0.53	0.16	0.21	0.19	0.54	0.38	0.17	0.26	0.26
Mg#	41.7	54.0	45.3	51.2	40.0	48.3	54.5	45.3	46.8
Modes (volume percent)									
Plagioclase	-	7.6	24.2	31.1	trace	0.6	9.2	1.0	0.2
Clinopyroxene	-	0.3	1.8	1.6	-	trace	0.1	0.1	trace
Orthopyroxene	-	-	-	2.1	-	-	-	-	-
Olivine	-	0.4	1.5	1.3	-	trace	0.3	-	-
Fe-Ti Oxide	-	-	trace	0.4	-	-	-	-	-
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	100.0	91.7	72.5	63.5	100.0	99.4	90.4	98.9	99.8
No. points counted		753	792	792		802	802	800	750
Texture (rock/ groundmass)	aphyric/ trachytic	seriate/ microgranular	seriate/ intersertal	seriate/ intersertal	aphyric/ trachytic	sparsely phytic/ intersertal	seriate/ intergranular	sparsely phytic/ trachytic	aphyric/ trachytic
Trace element analyses (ppm)									
Ba	231	147	183	156	234	256	143	183	171
Rb	17	14	17	9	17	26	14	17	11
Sr	372	353	276	299	364	332	382	303	327
Y	42	19	30	24	40	36	20	30	29
Zr	197	111	152	118	199	209	117	157	149
Nb	16.0	6.6	11.1	8.5	17.0	17.5	8.0	10.1	9.6
Ni	7	30	7	12	3	40	40	13	16
Cu	16	108	71	95	18	154	110	153	186
Zn	111	66	78	86	114	89	69	94	87
Cr	9	70	32	29	10	76	61	30	29

14741_attachment

Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	37	38	39	40	41	42	43	44	45
Field sample No.	00YC-P211	00YC-P113	99YC-P77	00YC-P194	00YC-P134A	00YC-P137A	99YC-P24	00YC-P191	99YC-P25
Latitude (N)	45°55.68'	45°56.58'	45°57.84'	45°55.08'	45°55.98'	45°57.36'	45°59.46'	45°55.02'	45°59.70'
Longitude (W)	122°29.76'	122°27.72'	122°26.40'	122°29.76'	122°28.02'	122°23.34'	122°25.98'	122°23.34'	122°25.62'
Map unit	Tba	Tba	Tba	Tba	Tba	Tba	Tba	Ta	Tba
Rock type	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Basaltic andesite	Andesite	Andesite	Andesite
Analyses as reported (wt percent)									
SiO ₂	55.59	55.54	55.77	55.88	56.10	56.75	56.63	56.87	57.00
TiO ₂	1.76	1.92	1.10	1.80	1.76	2.10	2.01	1.29	2.15
Al ₂ O ₃	15.82	15.12	17.95	15.66	15.45	15.77	15.41	18.33	15.30
FeO*	9.72	10.37	7.61	9.85	9.75	9.24	9.38	7.46	9.13
MnO	0.18	0.19	0.15	0.18	0.19	0.19	0.20	0.16	0.19
MgO	3.81	3.54	3.88	3.44	3.75	3.34	2.94	2.63	3.18
CaO	7.71	7.55	8.51	7.61	7.61	6.91	6.32	7.60	6.69
Na ₂ O	3.66	3.46	3.40	3.74	3.63	4.03	4.62	4.04	4.20
K ₂ O	0.89	1.21	1.02	0.69	0.95	1.07	1.07	0.78	1.17
P ₂ O ₅	0.26	0.34	0.18	0.28	0.26	0.33	0.39	0.23	0.45
Total	99.58	98.77	99.13	99.44	99.62	99.73	98.97	99.38	99.46
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	55.92	55.97	56.01	56.37	56.41	56.90	57.22	57.22	57.31
TiO ₂	1.77	1.93	1.11	1.82	1.77	2.10	2.03	1.30	2.16
Al ₂ O ₃	15.92	15.24	18.03	15.80	15.54	15.81	15.57	18.44	15.38
FeO*	9.78	10.45	7.64	9.94	9.80	9.27	9.48	7.51	9.18
MnO	0.18	0.19	0.15	0.18	0.19	0.19	0.20	0.16	0.19
MgO	3.83	3.57	3.90	3.47	3.77	3.35	2.97	2.65	3.20
CaO	7.76	7.61	8.55	7.68	7.65	6.93	6.39	7.65	6.73
Na ₂ O	3.68	3.49	3.41	3.77	3.65	4.04	4.67	4.06	4.22
K ₂ O	0.90	1.22	1.02	0.70	0.96	1.07	1.08	0.78	1.18
P ₂ O ₅	0.26	0.34	0.18	0.28	0.26	0.33	0.40	0.23	0.45
Mg#	45.1	41.7	51.7	42.3	44.7	43.1	39.7	42.5	42.2
Modes (volume percent)									
Plagioclase	1.1	0.2	16.4	0.2	2.1	trace	trace	18.3	-
Clinopyroxene	0.1	trace	0.9	trace	0.5	trace	-	trace	-
Orthopyroxene	-	-	-	-	-	-	-	0.3	-
Olivine	0.1	-	1.1	-	0.5	-	-	trace	-
Fe-Ti Oxide	-	-	-	trace	-	trace	-	trace	-
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	98.7	99.8	81.6	99.8	96.9	100.0	100.0	81.4	100.0
No. points counted	750	750	750	767	770	-	-	785	-
Texture (rock/ groundmass)	seriate/ trachytic	aphyric/ pilotaxitic	seriate/ intergranular	aphyric/ pilotaxitic	seriate/ trachytic	aphyric/ trachytic	aphyric/ intergranular	porphyritic/ pilotaxitic	aphyric/ intergranular
Trace element analyses (ppm)									
Ba	200	228	180	223	191	204	251	194	261
Rb	16	29	21	25	17	22	20	12	18
Sr	307	295	376	324	304	323	362	315	323
Y	30	35	23	38	28	34	39	31	37
Zr	154	208	138	206	157	176	210	147	224
Nb	10.4	13.5	8.7	11.7	10.2	12.5	18.7	10.0	19.2
Ni	9	12	33	5	11	0	4	2	9
Cu	317	222	80	185	172	20	96	96	125
Zn	85	97	71	94	90	86	105	81	96
Cr	23	19	53	12	26	8	9	6	17

14741_attachment

Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	55	56	57	58	59	60	61	62	63
Field sample No.	01YC-P284	01YC-P347	99YC-P78	01YC-P281C	00YC-P197	01YC-P280A	00YC-P201	99YC-P17	00YC-P190A
Latitude (N)	45°57.78'	45°53.52'	45°57.78'	45°58.35'	45°54.54'	45°58.50'	45°54.52'	45°53.76'	45°55.14'
Longitude (W)	122°22.86'	122°25.50'	122°26.34'	122°26.72'	122°24.90'	122°27.00'	122°25.32'	122°29.04'	122°22.62'
Map unit	Ta	Ta	Ta	Ta	Ta	Tia	Ta	Td	Td
Rock type	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Dacite	Dacite
Analyses as reported (wt percent)									
SiO ₂	58.31	58.92	59.05	60.03	60.84	60.87	61.10	65.03	65.65
TiO ₂	1.34	0.90	1.40	1.49	1.36	1.55	1.31	0.72	0.75
Al ₂ O ₃	16.09	17.38	15.92	15.17	15.72	15.14	16.04	16.12	14.74
FeO*	7.24	6.72	8.19	7.79	7.70	7.38	7.59	4.97	5.53
MnO	0.14	0.15	0.17	0.14	0.17	0.14	0.14	0.15	0.11
MgO	4.20	3.28	2.88	3.20	2.18	2.59	1.95	1.22	1.82
CaO	7.61	7.33	6.26	6.25	5.54	6.41	5.35	4.54	4.53
Na ₂ O	3.70	3.80	4.20	4.23	3.96	4.16	4.20	5.01	3.84
K ₂ O	0.66	0.83	1.04	1.08	1.62	0.71	1.50	0.84	1.86
P ₂ O ₅	0.34	0.14	0.18	0.34	0.30	0.37	0.28	0.23	0.16
Total	99.63	99.45	99.29	99.72	99.39	99.32	99.46	98.83	98.99
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	58.53	59.25	59.47	60.20	61.21	61.29	61.43	65.80	66.32
TiO ₂	1.34	0.90	1.41	1.49	1.37	1.56	1.32	0.73	0.76
Al ₂ O ₃	16.15	17.48	16.03	15.21	15.82	15.24	16.13	16.31	14.89
FeO*	7.27	6.76	8.25	7.81	7.75	7.43	7.63	5.03	5.58
MnO	0.14	0.15	0.17	0.14	0.17	0.14	0.14	0.15	0.12
MgO	4.22	3.30	2.90	3.21	2.19	2.61	1.96	1.23	1.84
CaO	7.64	7.37	6.30	6.27	5.57	6.45	5.38	4.59	4.58
Na ₂ O	3.71	3.82	4.23	4.24	3.98	4.19	4.22	5.07	3.88
K ₂ O	0.66	0.83	1.05	1.08	1.63	0.71	1.51	0.85	1.88
P ₂ O ₅	0.34	0.14	0.18	0.34	0.30	0.37	0.28	0.23	0.16
Mg#	51.1	54.9	50.6	42.4	46.3	37.3	42.4	35.0	40.8
Modes (volume percent)									
Plagioclase	23.6	31.7	3.8	4.1	0.4	1.9	7.5	9.8	5.8
Clinopyroxene	2.8	3.7	0.4	1.0	0.1	0.5	0.8	0.3	0.6
Orthopyroxene	4.8	2.5	0.4	0.2	-	0.2	trace	0.8	0.4
Olivine	-	0.4	-	0.4	-	-	-	-	-
Fe-Ti Oxide	-	0.5	0.1	0.2	trace	trace	0.1	0.2	0.2
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	68.8	61.2	95.3	94.1	99.5	97.4	91.6	88.9	93.0
No. points counted	800	775	800	780	800	800	800	789	810
Texture (rock/ groundmass)	porphyritic/ intersertal	porphyritic/ hyalopilitic	sparsely phytic/ pilotaxitic	porphyritic/ pilotaxitic	sparsely phytic/ pilotaxitic	sparsely phytic/ intersertal	porphyritic/ pilotaxitic	seriate/ intersertal	porphyritic/ snowflake
Trace element analyses (ppm)									
Ba	254	213	208	306	313	366	316	255	365
Rb	25	18	23	39	43	35	34	36	51
Sr	357	293	337	320	226	362	233	295	198
Y	30	21	37	35	42	38	41	31	36
Zr	247	124	139	276	247	295	219	176	259
Nb	18.9	7.7	8.8	17.7	14.6	19.5	14.2	12.2	13.4
Ni	46	18	6	20	1	9	0	8	10
Cu	139	138	159	140	23	144	26	26	53
Zn	84	76	89	84	89	86	85	84	63
Cr	86	29	13	68	2	8	0	2	16

14741_attachment

Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	46	47	48	49	50	51	52	53	54
Field sample No.	99YC-P31	99YC-P66A	99YC-P74	99YC-P95C	01YC-P349	99YC-P89B	99YC-P84	99YC-P39	00YC-P159
Latitude (N)	45°57.66'	45°53.52'	45°57.78'	45°57.84'	45°53.22'	45°57.78'	45°56.76'	45°57.18'	45°57.84'
Longitude (W)	122°28.92'	122°25.14'	122°26.94'	122°27.36'	122°25.20'	122°26.10'	122°26.82'	122°26.34'	122°23.40'
Map unit	Ta	Ta	Ta	Ta	Ta	Ta	Ta	Ta	Ta
Rock type	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
Analyses as reported (wt percent)									
SiO ₂	57.08	57.14	57.09	57.48	57.25	57.58	57.67	57.26	57.97
TiO ₂	1.23	0.96	1.14	1.22	1.34	1.20	1.60	1.59	1.32
Al ₂ O ₃	16.72	18.47	16.80	16.66	16.93	16.34	16.93	16.54	15.88
FeO*	7.64	7.01	7.53	7.68	8.29	7.50	8.30	8.45	7.88
MnO	0.16	0.18	0.14	0.17	0.18	0.15	0.17	0.16	0.13
MgO	4.06	3.18	4.26	3.88	3.21	4.77	2.71	2.89	3.93
CaO	7.36	8.13	7.48	7.85	7.09	7.07	6.87	6.78	7.10
Na ₂ O	3.55	3.56	3.60	3.74	3.97	3.65	4.18	4.08	3.49
K ₂ O	1.45	0.72	1.14	1.02	1.00	1.26	1.08	1.04	1.43
P ₂ O ₅	0.23	0.13	0.19	0.22	0.22	0.23	0.32	0.32	0.34
Total	99.48	99.48	99.37	99.92	99.48	99.75	99.83	99.11	99.47
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)									
SiO ₂	57.38	57.44	57.45	57.52	57.55	57.72	57.77	57.77	58.28
TiO ₂	1.24	0.97	1.15	1.22	1.35	1.20	1.60	1.60	1.33
Al ₂ O ₃	16.81	18.57	16.91	16.67	17.02	16.38	16.96	16.69	15.97
FeO*	7.68	7.05	7.58	7.69	8.33	7.52	8.31	8.53	7.92
MnO	0.16	0.18	0.14	0.17	0.18	0.15	0.17	0.16	0.13
MgO	4.08	3.20	4.29	3.88	3.23	4.78	2.71	2.92	3.95
CaO	7.40	8.17	7.53	7.86	7.13	7.09	6.88	6.84	7.14
Na ₂ O	3.57	3.58	3.62	3.74	3.99	3.66	4.19	4.12	3.51
K ₂ O	1.46	0.72	1.15	1.02	1.01	1.26	1.08	1.05	1.44
P ₂ O ₅	0.23	0.13	0.19	0.22	0.22	0.23	0.32	0.32	0.34
Mg#	42.2	52.7	48.8	54.3	51.4	44.8	57.1	40.7	51.1
Modes (volume percent)									
Plagioclase	23.3	24.7	23.1	2.7	19.1	5.0	8.7	9.5	29.2
Clinopyroxene	2.5	3.2	2.9	0.2	1.1	1.1	-	-	2.7
Orthopyroxene	3.9	4.0	3.1	0.5	2.5	1.1	-	-	5.9
Olivine	-	1.4	1.0	-	-	1.8	0.1	0.1	-
Fe-Ti Oxide	0.1	-	0.2	0.2	0.4	-	0.1	0.2	0.2
Hornblende	-	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	-	-	-	-	-
K-feldspar	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Groundmass	70.2	66.7	69.7	96.4	76.9	91.0	91.1	90.2	62.0
No. points counted	790	810	796	810	796	800	784	770	783
Texture (rock/ groundmass)	porphyritic/ hyalopilitic	porphyritic/ intergranular	porphyritic/ intergranular	seriate/ insertal	seriate/ insertal	seriate/ intergranular	seriate/ insertal	seriate/ intergranular	porphyritic/ intergranular
Trace element analyses (ppm)									
Ba	241	174	211	196	204	211	214	194	258
Rb	30	15	22	19	26	26	21	18	27
Sr	327	299	331	341	287	305	318	314	317
Y	29	20	25	25	30	29	36	34	29
Zr	198	109	159	155	147	181	193	191	248
Nb	12.4	5.8	9.2	10.5	9.5	11.3	14.3	12.4	18.5
Ni	38	22	38	27	7	75	3	9	44
Cu	160	117	87	131	113	89	99	130	63
Zn	73	70	77	80	97	80	85	87	78
Cr	59	39	74	37	14	180	5	10	77

14741_attachment

Table 1. Chemical analyses of volcanic and intrusive rocks, Amboy 7.5' quadrangle—Continued

Map No.	64	65	66	67	68	69	70	71
Field sample No.	99YC-P65	01YC-P277A	01YC-P282	01YC-P278	00YC-P106	99YC-P64	00YC-P124B	01YC-P238
Latitude (N)	45°55.86'	45°58.80'	45°58.08'	45°58.68'	45°56.64'	45°56.70'	45°58.26'	45°54.36'
Longitude (W)	122°27.36'	122°29.34'	122°25.50'	122°27.36'	122°24.06'	122°26.68'	122°26.58'	122°25.68'
Map unit	Td	Tdib	Tdib	Tdib	Tdi	Tdid	Tdib	Tdic
Rock type	Dacite	Hypersthene microdiorite	Pyroxene diorite	Microdiorite	Pyroxene diorite	Augite diorite	Pyroxene diorite	Hypersthene microdiorite
Analyses as reported (wt percent)								
SiO ₂	69.59	53.21	54.20	54.61	54.95	56.42	57.53	58.19
TiO ₂	0.61	1.59	1.19	1.15	1.48	1.23	1.30	0.39
Al ₂ O ₃	15.06	16.96	17.50	17.38	16.35	17.78	15.26	20.09
FeO*	3.68	8.93	8.48	7.97	9.58	8.13	7.88	4.32
MnO	0.13	0.15	0.16	0.30	0.20	0.18	0.14	0.09
MgO	0.27	4.48	5.19	4.72	2.42	2.55	4.34	3.63
CaO	2.44	9.14	9.76	9.67	8.57	7.83	7.30	8.61
Na ₂ O	4.81	3.41	2.97	3.16	3.72	3.82	3.29	3.07
K ₂ O	2.29	1.03	0.28	0.71	0.59	0.59	1.46	0.90
P ₂ O ₅	0.15	0.28	0.19	0.19	0.22	0.19	0.28	0.10
Total	99.03	99.18	99.92	99.86	98.08	98.72	98.78	99.39
Analyses recalculated volatile-free and normalized to 100% with all Fe as FeO (wt percent)								
SiO ₂	70.28	53.65	54.24	54.69	56.02	57.15	58.24	58.55
TiO ₂	0.61	1.60	1.19	1.15	1.51	1.25	1.32	0.39
Al ₂ O ₃	15.21	17.10	17.51	17.40	16.67	18.01	15.45	20.21
FeO*	3.72	9.00	8.49	7.98	9.77	8.24	7.98	4.35
MnO	0.13	0.15	0.16	0.30	0.20	0.18	0.15	0.09
MgO	0.27	4.52	5.19	4.73	2.47	2.58	4.39	3.65
CaO	2.46	9.22	9.77	9.68	8.74	7.93	7.39	8.66
Na ₂ O	4.86	3.44	2.97	3.16	3.79	3.87	3.33	3.09
K ₂ O	2.31	1.04	0.28	0.71	0.60	0.60	1.48	0.91
P ₂ O ₅	0.15	0.28	0.19	0.19	0.23	0.20	0.28	0.10
Mg#	13.3	51.3	56.2	55.4	34.6	39.7	53.6	63.8
Modes (volume percent)								
Plagioclase	4.3	41.9	58.7	19.5	65.1	62.2	51.5	27.1
Clinopyroxene	-	0.4	17.3	-	8.1	18.1	15.4	0.2
Orthopyroxene	0.9	5.0	5.3	-	3.6	-	3.0	2.2
Olivine	-	0.2	1.0	0.7	-	-	3.1	-
Fe-Ti Oxide	0.3	-	1.5	-	2.8	2.6	2.1	-
Hornblende	-	-	-	-	-	-	-	-
Quartz	-	-	-	-	3.2	2.2	0.4	-
K-feldspar	-	-	-	-	-	-	-	-
Other	-	-	[†] interstit cl: 16.2	-	[†] interstit cl: 17.2	[†] qtz-fsp: 14.9	[†] devit gl: 24.5	-
Groundmass	94.5	52.5	0.0	79.8	0.0	0.0	0.0	70.5
No. points counted	800	785	817	744	786	814	791	780
Texture (rock/ groundmass)	porphyritic/ snowflake	seriate/ intergranular	seriate/ intergranular	seriate/ intergranular	aphanitic/ intergranular	hypidiomorphic granular	seriate/ intergranular	seriate/ intergranular
Trace element analyses (ppm)								
Ba	394	218	134	161	169	141	262	151
Rb	56	16	2	11	9	12	28	10
Sr	175	442	362	367	289	300	287	693
Y	44	28	22	20	30	25	29	7
Zr	406	169	133	119	120	112	218	78
Nb	23.7	12.2	9.6	7.9	8.4	7.4	13.4	2.2
Ni	10	56	34	32	0	6	33	24
Cu	38	166	85	100	133	101	124	33
Zn	85	89	76	72	97	88	76	43
Cr	1	67	88	89	6	8	157	16

[†]interstit cl, interstitial clay; qtz-fsp, quartz+feldspar intergrowths; devit gl, devitrified glass

14741_attachment

Table 2. Summary of ⁴⁰Ar/³⁹Ar incremental-heating age determinations, Amboy 7.5' quadrangle

Field sample no.	Location Latitude (N)	Location Longitude (W)	Map unit	Rock type	Material dated	Age (±1σ error)	Source
00YC-P32	45°57.84'	122°29.04'	Qat	Tephra bed beneath till (Qat)	Plagioclase	250±36 ka	R.J. Fleck, written commun., 2003
01YC-P217A	45°53.46'	122°28.74'	Tt	Dacitic welded tuff	Plagioclase	33.0±0.1 Ma	R.J. Fleck, written commun., 2004
00YC-P206	45°54.84'	122°24.18'	Tt	Dacitic welded tuff	Plagioclase	33.4±0.4 Ma	R.J. Fleck, written commun., 2001

14742

MARGARET E STROEBE

03/23/2013

- 14742-1 | I do not feel the need for a new corridor to be built. I think the funds would be better spent making improvements on the existing corridor. I do not think that air conditioning demand in the northwest is a
- 14742-2 | good enough reason to create a building project of this magnitude. If the project must continue, I would recommend that news towers be built through forest land, and not require building through residential
- 14742-3 | communities. There should also be more consideration given to conservation methods and alternative energy sources to limit consumption. Building new lines, will only encourage consumption to increase.

- 14742-1 Please see the response to Comment 14704-3.
- 14742-2 Comment noted.
- 14742-3 As the commenter states, conservation methods do limit consumption. Alternative energy sources usually require transmission lines to get the power generated to load centers, unless an energy source generates electricity directly at the point of consumption, for example, rooftop solar panels on a home. Section 4.7.1, Non-Wires Alternatives, describes how BPA studied non-wire measures to meet the project need and found that even with aggressive implementation of all four non-wires measures, the amount of power reduced on the SOA path would not be enough to meet the project need after 2021.

i-5 Corridor Reinforcement Project
PO Box 9520
Portland, Oregon 97207

To the BPA:

14743-1

As a local business owner and a resident of Cowlitz County for generations, I cannot conceive that the BPA would choose a route for their new power lines that would so severely affect a community that is finally on the brink of expansion and economic development. Castle Rock has recently poured millions of dollars into their city and surrounding area to make it a better place to live, work and play. Now the BPA is threatening to build directly across the future urban growth area and create stagnant land that would forever halt the northward expansion of the city for new homes, businesses and industrial growth. In addition, the lines would affect *both* sides of the river of a community that depends on the Cowlitz River as one of its major attractions.

The preferred alternative as it currently stands would be within less than a mile of endangered wildlife, housing developments, businesses, a boat launch, a school and the extensive North County Recreation Complex. The BPA claims of the safety of their lines for healthy living standards are immaterial when the *perception* held by the general public of living near the lines is quite different. With the new lines in place using this preferred alternative route, new growth is halted, land values plummet, people currently living in the area relocate and revenues for schools and other tax-based revenues are slashed.

14743-2

In closing, I believe that the BPA owes it to the citizens of Cowlitz County and especially to the businesses and people of Castle Rock to re-open the scoping process and take a closer look at the alternatives farther north and farther east.

The BPA has other viable options for expansion. We cannot move our city.

Sincerely,



Sandra Keatley

Cc: Longview Daily News

- 14743-1 Please see the responses to Comments 14140-2 and 14291-3 for effects on property values and county tax revenue.

Please see the responses to Comments 14097-1 and 14565-19 regarding line routing and advantages of crossing the Cowlitz river at the selected site.

Please see the response to Comment 14493-2 regarding recreational use at the Cowlitz River crossing.

Chapter 8, Electric and Magnetic Fields, describes electronic and magnetic field levels for the proposed project and Appendix G discusses the latest research in health effects.

- 14743-2 Please see the response to Comment 14638-4 concerning the reasons why potential routes farther northeast were considered but eliminated from detailed study in the EIS.

14744

RICHARD LIEN

03/23/2013

- 14744-1 The decision by the BPA to favor the Central route alternative was certainly not the best selection, but is far better than selecting the West route. The line should be placed farther East, with the fewest people placed in danger of the the negative health effects of the high power transmission lines. The West route would affect thousands of people, far more than any other route. Having an implanted internal defibrillator/pacemaker, there are many warnings and restrictions about being in the vacinity of high
- 14744-2 electromagnetic fields. Living next to the current power lines, with their lower power transmission, does not pose a threat. The new lines however may exceed the shielding ability of the device. I don't want to take the chances involved with the new transmission lines.

14745

RICHARD A FREEDING JR

03/23/2013

- 14745-1 1) With regard to the western route, your denial of a study that is unfavorable to you is nothing short of criminal. This is especially true when public health issues are at stake.
- Your conduct isn't any different then the denial of area 51. You have been ordered by a federal court to release said information. So release it.
- 14745-2 2) You have made a point of the extra cost if another route is selected. That may be true if the situation is viewed through myopic eyes. The western route ,as you know, cannot expand when future requirements are needed. Thus the whole process will again need to be redone but at a much higher cost. Now we know you are not going to tear down the power lines after a few years, in fact, like the proverbial toll bridge, your charges for carried energy will continue indefinitely. So by paying a bit more now you recoup your costs sooner with the ability to expand down stream.
- 3) Stop burying your head in the sand when so many families are going to be negatively affected and with the possibility of future generations also being negatively affected.
- The western route is not the best choice!

14744-1 Comment noted.

14744-2 Please see the responses to Comments 14328-6 and 14510-2.

14745-1 Comment noted. Without more details, BPA is unclear about what this comment refers to. BPA addresses health and safety in Chapter 10.

14745-2 The Preferred Alternative is the Central Alternative using Central Option 1.

From: noreply@bpa.gov
Sent: Saturday, March 23, 2013 4:08 PM
Subject: 14746: BPA I5 Comment Submission Confirmation

Thank you for submitting your comments on the Bonneville Power Administration's draft environmental impact statement (EIS) for the I-5 Corridor Reinforcement Project. All comments submitted between November 13, 2013 and noon on March 25, 2013 will be responded to in the final EIS, which is expected in 2014.

A copy of your information, as submitted using our online form, is included below for your records. If you provided your contact information and submitted a question we can answer at this time, you will receive a response. Your contact information will also be added to our project mailing list. All comments including names will be processed and then posted on BPA's website at www.bpa.gov/goto/i-5

Sincerely,
Bonneville Power Administration

Name: Cheryl k Brantley
Organization: A Better Way for BPA Dole Valley Landowners Coalition Friends of Green Mountain Tum Tum Mountain Area Landowners Coalition
E-mail:
Phone:
Address:

Group type: Special interest group

Please ADD me to the mailing list.

Comment:

14746-1

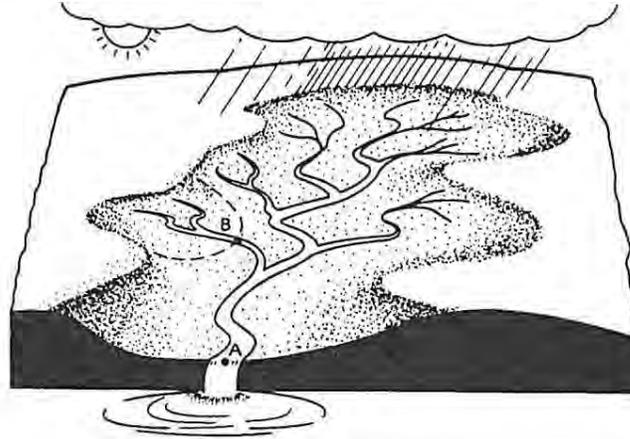
Ground water should be protected at all cost. When there is even a small doubt about a site as at the Reynolds plant in Troutdale where 6 towers are planned over a fluoride plume and the International Paper Company toxic sites in Chelatchie Prairie with buried pcb barrels that could have toxic contamination combined with the removal of vegetation for over 80 miles in areas where there is ground instability, our water sources are at risk along a new transmission corridor in the rural communities of SW Washington. We agree with COWLITZ COUNTY WASHINGTON COMPREHENSIVE PLAN which states: Purpose: Prevent degradation of ground water supplies by various land use activities. Rationale: A variety of land use activities can act together as non-point sources to impact ground water supplies. It is more efficient and cost-effective to prevent land use activities from impacting ground water supplies than attempting to clean up ground water supplies after they have been impacted.

[Attachment](#)

- 14746-1 Please see the responses to Comments 14683-6, 14683-9, 14775-11, 14775-2, 14791-21 and 14791-22 regarding contaminated soils. Please see the response to Comment 14533-3 regarding project effects on stream hydrology.

14746

INTRODUCTION



Watersheds are areas of land bounded by a hydrological system where all the water under it or that drains off of it goes to a common body of water such as a lake, river, or ocean. All lands are in a watershed and most often their boundaries cross jurisdictional and political borders. Some watersheds are small and drain just a few acres of land. Others are expansive estuaries where the rivers meet the sea. The functions and processes in our watersheds affect water quality and our drinking water supplies. Water quality is directly connected to wildlife habitats, and to our own quality of life.

Planning by Watershed

Water resource planners have long used watersheds to plan for and manage water resource management. Historically, river basins were geared toward economic development. The Tennessee Valley Authority (TVA) is one of the first examples of using river basin planning to effectively ensure reliable sources of power, navigation, irrigation, and recreation basin wide. River basin planning has since become synonymous with watershed planning.

Watersheds continue to be important geographic units to use for planning purposes. In updating its Comprehensive Plan, Cowlitz County evaluated land supply and development suitability using water resource inventory areas

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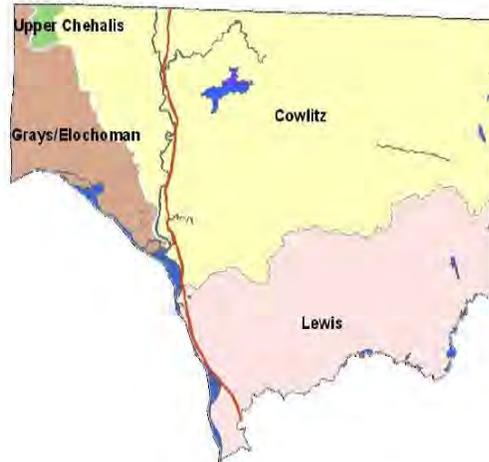
(WRIAs). Land development suitability is an assessment of the physical landscape that includes the natural and built environments. Demographics and economic development were considered at the countywide level. Ultimately, all topic areas were integrated emphasizing interdependent relationships.

Cowlitz County WRIAs

The Department of Ecology (DOE) has divided Washington State into 62 WRIAs to delineate the state’s major watersheds. Each WRIA is further delineated at a subbasin or subwatershed level. Cowlitz County, Washington is within four WRIAs.

- Upper Chehalis, WRIA 23
- Grays/Elochoman, WRIA 25
- Cowlitz, WRIA 26
- Lewis, WRIA 27
-

Cowlitz County, Washington
Water Resource Inventory Areas



WRIA 27 – Lewis River

This section summarizes conditions in the Lewis River Watershed, WRIA 27, within Cowlitz County. The Lewis WRIA is a big watershed that drains portions of Mt. St. Helens and Mt. Adams. There are three subbasins in WRIA 27.



WRIA 27 Subbasins

- Kalama River
- North Fork of the Lewis River
- Middle Lewis (small portion)

These will be grouped as the Kalama and NF Lewis.

Quick Facts for WRIA 27*

Land Area

WRIA 27 is approximately 282 square miles or 24.7% of the County's 1,139 square mile total.

The City of Kalama is 3.81 square miles and the City of Woodland is 3.57 square miles for a combined total of 7.38 square miles or 2.6% of WRIA 27 land area.

Population

An estimated 14,966 people live in WRIA 27 this represents approximately 14.6% of total county population (102,410).

The combined 2010 population counts for the cities of Kalama (2,344) and Woodland (5,509) total 7,853. The unincorporated county share of the WRIA 27 population is estimated at 7,113.

The population percent split is 53% live in cities and 47% live in County.

Housing Units

WRIA 27 has approximately 6,058 housing units of which 1,070 are in the City of Kalama and 2,108 are in the City of Woodland for a combined total of 3,178 houses in city limits. The balance - 2,880 houses - is in the unincorporated portion of WRIA 27.

Density

The population densities for cities and unincorporated area in WRIA 27 are illustrated below.

CITIES
XXXXXXXXXXXX
XXXXXXXXXXXX = 50-acre
XXXXXXXXXXXX

UNINCORPORATED AREA
XX = 50-acres

*Cowlitz County portion

Background and Demographic Profile

Early Settlement

One of the original counties in the Washington Territory, archeological evidence indicates the presence of tribes fishing for salmon in the Lewis basin long before Lewis and Clark camped near the mouth of Kalama creek in the early 1800's.

Woodland: The first permanent settlers arrived shortly thereafter. A. Le Lewes, a retired Hudson's Bay Company staked a land claim near the present town of Woodland to become one of the first settlements in the Lewis River community.

By 1880, Woodland was named in reference to the abundant surrounding douglas fir. The community had a general store, post office, and was linked by steamboat to larger communities along the Columbia River and Portland. Families moved in and staked claims under the Donation Land Act. Many of these began raising orchard fruits and vegetables in the rich bottomlands.

From this time and up to its official incorporation in 1906, the City of Woodland added a school, blacksmith shops, saloon, a hotel and restaurants, several more stores, and had greater connections to transportation networks including making it the center of the Lewis River community.

Kalama: Originally settled by John Kalama, the town was officially named in 1871 after the Northern Pacific Railway established the community as the western terminus of the cross continental rail system. Kalama became the third County seat in 1873 and grew to be one of the largest communities in Washington and Oregon Territories with the completion of the transcontinental railroad in 1880.

In addition to these incorporated areas, the towns of Ariel, Yale, and Cougar (located along what is now State Route 503) also play an important role in shaping the character of the County.

Ariel: Ariel is located 10 miles east of Woodland on State Route 503, at the west end of Lake Merwin. In 1912, the town of Ariel was a village of about 200 people with a post office. The original town site was moved in 1929 when the creation of Merwin Dam flooded the townsite. Logging and lumbering were the chief industries, with some stock raising.

Cougar:**Yale:**Early Conditions

Before significant settlement occurred, the Lewis watershed consisted mainly of large conifer forests of douglas fir, cedar, and western hemlock. The lower half of the watershed along the river banks was described as dense stands of fir, hemlock, with some cedar, alder, and maple undergrowth.

Fertile meadows (Spelayai and Chelatchie Praieires). The middle and upper Lewis River drainage, from present-day Ariel to Speelyai Creek, was settled later than the lower valley. Filled with imposing timber, fast flowing rivers and streams, choking underbrush, and sandy, mostly third-rate soil, the upper valley was rugged. With the exception of some of the fern-covered "prairies" and flat valley-bottom lands that could easily be converted to agricultural production, the middle and upper Lewis River drainage offered few attractions to early settlers.

European settlement occurred over past 160 years have transformed the vegetations, soils properties, flow regimes in Lewis River watershed.

Environment

This started to change in the 1880s and the 1890s, when the timber industry began to make headway up the valley, creating treeless "prairies" where none had existed previously. By 1890, a logging camp was established in the Speelyai Prairie area, clearing land that was later taken up by "stump farmers" following the economic depression of the 1890s (Jermann and Mason 1976; PacifiCorp 1999). Surveyors for the General Land Office documented small farmsteads throughout the Project area by the early 1890s. By the end of the 19th century, steamboat traffic on the river was a regular and integral part of life in the valley, moving farmers and loggers, their goods, mail, and produce as far up as Speelyai Creek (PacifiCorp 1999). Settlers took advantage of the Homestead Act of 1862 to move farther up the Lewis River Valley.

Vegetation along river riparian cleared for access, uplands also cleared to supply local cordwood for Vancouver, Portland construction (schools, residences, chruces, businesses) also cleared for farmlands in uplands. Much of riparian areas in lower watersheds were cleared by 1860 and commercial logging was done in earnest.

In 1871, the first commercial logging camp and saw mill in watershed was started followed by more mills. Cedar was heavily harvested species for roofing materials.

Historic and cultural stuff

The Yale Bridge or Lewis River Bridge that spans the Lewis River along State Route 503 is the only short-span steel suspension bridge in the state of Washington. It was built in 1932 by Cowlitz and Clark Counties to replace a previous bridge after construction of the Ariel Dam at Lake Merwin. The Yale Bridge was placed on the National Register of Historic Places (NRHP) in 1982.

The Jim Creek Bridge, crossing Jim Creek along State Route 503 between Ariel and Yale, built in 1945 was listed on the NRHP in 1995.

Anthropogenic Modifications**CHANNEL MODIFICATION**

Late 1800's to early 1900's US Army Corps of Engineers removed snags and deepened the North Fork to Speelyai Creek and the Lower East Fork channels for steamships. These along with boat wakes, led to bank erosion, farmer demanded bank protection which changed channel from multi thread to single thread with disconnected sloughs and floodplains. Gravel mining. Channel and floodplain modifications have led to a loss in floodplain connectivity and straightening channels. Loss in physical floodplain processes such as flood and sediment storage.

LEVEES: Channel pattern and floodplain connectivity also influenced by levees. Flooding was a problem for early settlers. 1853 historical notation river overflowed its banks on a yearly basis in lower watershed. Flood control was initiated. Construction of levees modified channel pattern and floodplain connectivity, also led to increased floodplain development along lower Lewis river.

VICINITY- WRIA 27 Map, vicinity in Cowlitz County

LAND AREA: CITIES, UNINCORPORATED URBAN, RURAL, RESOURCE, STATE & FEDERAL LANDS

TOPOGRAPHY

GEOLOGY

CLIMATE

CULTURE & HISTORIC AREAS

DEMOGRAPHICS

Physical Setting

14746

Key features of WRIA 27 are displayed in Exhibit X

The planning area occupies approximately 1,800 square miles, including

The physiography of the area is widely varied, ranging from temperate lowlands near sea level to high mountainous terrain at elevations over 12,000 feet. Its headwaters are situated along the crest of the Cascade Range.

Kalama subbasin(Cowlitz County's largest subbasin in WRIA 27),

Subbasin Description

Topography & Geology

Geologically young and physically dynamic because of glacial and tectonic activities such as volcanoes and earthquakes.

Pleistocene continental ice sheet did not extend to the Lewis watershed, alpine glaciers and the Missoula flood left their mark on the landscape.

Volcanic activities continues to influence the landscape, Mt. St. Helens has had number eruptions with tephra deposits, lahars, and debris and pyroclastic flows entering the Lewis watershed (Jamjor and Scott 1988, Pacific Corp and Cowlitz PUD 2002).

Evidence of the farthest usgs sediment data indicates activity downstream of Merwin Dam, Lahar runout floods also extended toward Woodland.

Ecosystems and phsyical processes are intricately linked

The Kalam River subbasin is a 205 square mile watershed. Bordered by thy Toutle and Coweemand basins to the north and the northfork Lewis Basins to the South. 00% of the basin lies within Cowlitz County.

Kalama River is a tributary of the Columbia River. Its entire course is contained within Cowlitz County. Headwaters are in Skamania County.

The Kalama River originates in the Cascade Range on the southwest slopes of Mount St. Helens and flows southwesterly about 44 miles to its confluence with the Columbia River near the City of Kalama.

Major tributaries in Cowlitz County include Gobar Creek,

Near the present day location of the Kalama Marina, on March 19, 1871, the Northern Pacific Railroad began construction of the first mainline rails in the northwestern United States.

Kalama was selected because NP engineers determined it was down-river from winter river ice, the Columbia River channel depth was the same as at the river's bar at Astoria, and it was close to Portland and the Willamette Valley. In 1872, Kalama was voted the new county seat as it became an important transportation center with construction of a north-south railway connecting Vancouver to Tacoma.

With the County Seat, came the First County Jail and in 1892 the first of three hangings in Cowlitz County before the state took responsibility of the hangings in 1904.

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The railroad would go northerly down the Columbia River, follow portions of the Cowlitz River, and then on northward toward Puget Sound. At that point in time, the Puget Sound terminus was undetermined.

When Tacoma was finally selected as the NP's western terminus, final track alignments were determined near the Nisqually River and track work was completed into Tacoma on December 27, 1873.

The first regularly scheduled trains between Kalama and Tacoma began January 5, 1874. The Northern Pacific Railroad staff overcame many serious challenges during this time, including a huge landslide and serious financial problems just as the rail approached Tacoma.

This western rail would ultimately connect with work started on February 15, 1870 near Carlton, Minnesota, creating a transcontinental line across the northern portion of the United States.

It would be hard to overstate the long-term economic, social, and even strategic importance of this Northern Pacific Railroad route... which started east in Kalama.

Elevation ranges from Sea level at the Columbia R to near 8000 feet on Mount St. Helens. The landscape of the basin has been shaped by past eruptions of Mount St. Helens and the associated lahars (mud flows) that have left unconsolidated deposits creating slope stability in the steep watershed.

Lower basin is low gradient, tidally influenced. River course runs through a narrow v shaped valley, Kalama river falls.

include Fossil Creek, North Fork, Langdon Creek, Gobar Creek, Wildhorse Creek, and Hatchery Creek among others.

Elevations within the basin range from less than 100 feet in the lower reaches near the river's mouth to 5,000 - 6,000 feet in the upper basin.

Private timber companies own and manage approximately 96 percent of the Kalama watershed. The Washington Department of Natural Resources manages a few sections in the basin and the U.S. Forest Service owns a limited number of parcels in the upper portion of the watershed.

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Climate: The Kalama subbasin experiences a maritime climate with cool, wet winters and dry, warm summers. Mean annual precipitation is 68 inches at the Kalama Falls Hatchery and is over 120 inches on the upper subbasin – mostly October through March.

Land Use/Land Cover: most of the basin is forested and nearly the entire basin is managed for commercial timber production (96%). Only 1.3% is non-commercial forest and 1.5% is cropland. Areas along the lower river have experienced industrial and residential development, resulting in channelization of the lower river.

Population density and development are

Changes in population:

The town of Kalama, located near the mouth, is the only urban area in the basin. A portion of the upper basin is located within the Mount St. Helens National Volcanic Monument. The Monument is managed primarily for natural resource protection and tourism.

A breakdown of land ownership and land cover in the Kalama basin is presented in Figure X,Y,Z

Patterns of landownership for basin in figure W shows....

Habitat:

Fish species- natural spawning is concentrated between the mainstem Kalama and the Kalama Falls and Fallert Creek (Lower Kalama) hatcheries. NMFS status assessment for Kalama River

Water Systems

- Surface and ground water resources
- Surface and ground water quality
- Demand
- Habitat

This watershed consists of the Lewis River and numerous tributary creeks and streams. There is limited water available for new uses in WRIA 27 given that river levels need to be maintained to ensure adequate water quality and to support habitat (fish migration).

Factors affecting water availability is that most of the water in the Lewis River Watershed has already been spoken for by fish (stream flow levels for migration) and the senior water rights holders who are Pacificorp whose rights are to maintain reservoir levels in Lake Merwin and Yale Lake.

FUNCTIONS

RIPARIAN FUNCTION

Logging practices maintained to along andromous stream channels need riparian vegetation – good forest practices. Requirements under the Washington State Forest Practices Rules (WAC Chapter 222).

FLOODPLAIN FUNCTION

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Nearly all of the lower floodplain has been disconnected from the river due to dikes, I-5, and development on the Port of Kalama Property (Wade 2000).

NATURAL RESOURCES

TREES- dominant tree species in the Lewis watershed are Douglas fir and Western Hemlock.

Vegetation: mix of early, mid, and late seral stage forests. Various aged clear-cuts, native grasslands, shrubs, etc in Upper North fork.

Lower North Fork Lewis River is dominated by agricultural uses, recreations grasses (golf course) shrubs, native grasses, forests.

DAMS –Flood management

PacifiCorp's three reservoirs critical role in flood management since the 1930's. Cowlitz county received money – notification system? For residents along the river during high-runoff events. PacifiCorp operates as Pacific Power.
<http://www.pacificcorp.com/index.html>

Federal Energy Regulatory Commission (FERC) is licensing authority for hydroelectric projects,

Cowlitz PUD

<http://www.cowlitzpud.org/>

Publicly owned utility serving _____ electric customers in Cowlitz county. Swift No. 2 utility constructed in late 1950s generated 70 –megawatt.

Construction of three large multipurpose dams, beginning in the 1920's was primary change agent on the North Fork Lewis. Altered natural functions and processes.

Reservoirs, Merwin & Swift, Yale reservoir. BLM

Dams have changed channel pattern from historic conditions. Affecting sloughs (gone) sediment. Near Yale reservoir, described the channel as having rich bottomlands along the North Fork Lewis River and Speelyai Creek. Uplands on a glacial-fluvial terrace above river.

Lewis River dams- there are three of them (relicensing plan in 2004 for continued operation for 50 years on Merwin, Yale, Swift 1 dams owned by Pacific Corp together generates 510 MW –serves more than a quarter million residential customers. Fourth Lewis River hydroelectric project SWIFT #3 70-MW owned by Cowlitz PUD meets 10-15 percent of electricity needs and Cowlitz PUD

Kalama River

Subbasin Characteristics Relevant to Stream Flow

This subbasin is particularly important to regional recovery. Populations of fall Chinook, spring Chinook, winter steelhead and summer steelhead. The Kalama River Subbasin has a drainage area of approximately 224 square miles and enters the Columbia River. The

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population center within the subbasin consists of the community of Kalama. As such, the major municipal and industrial water uses are located at the downstream end of the Kalama River, in the City of Kalama and Port of Kalama. Most of the subbasin's future development and water demands are likely to occur in this area as well. The City of Kalama has submitted an application for increased withdrawals from its Ranney well on the Kalama River. The Ranney well is located a short distance upstream of the zone of tidal influence. Approximately 96% of the watershed is in commercial forestry and owned by private companies. Much of the watershed was logged resulting in construction of a road network, removal of large woody debris, and impacts to riparian zones. Furthermore, most of the historic floodplain has been diked and disconnected from the river to protect highway and industrial developments. Although the Kalama River historically had minimal floodplains, construction of Interstate 5 cut off the lower floodplains and the Port of Kalama completed the channelization of the river. While there may be some opportunities to reconnect the river channel to its floodplain, modification of major infrastructure features may not be feasible or economical.

The gradient of the Kalama River along the lower 8 miles is flat to moderate and the tidal influence extends up to about river mile 2.8. At river mile 10 the lower Kalama Falls blocks most anadromous fish, while at river mile 35 an impassable falls blocks all fish migration. In fact, many of the tributaries to the Kalama have steep gradients and only their lower portions are accessible to anadromous fish (Wade, 2000). Appendix G contains a description and map of existing surface water source limitations (SWSLs). There is one administrative low flow currently in place in this subbasin, restricting issuance of new water rights.

An initial analysis has been made regarding comparison of the existing administrative low flow with the priority reaches identified as part of LCFRB's salmon recovery planning effort. The entire Kalama River mainstem upstream of the tidal reach affected by Columbia River flows has been identified as Tier 1 or Tier 2 priority reaches.

An IFIM study was conducted by the Department of Ecology and WDFW in 1999. Based on the Conservation Commission's Limiting Factor Analysis (LFA), the Kalama River Subbasin has high road densities that have caused increased stream channel networking leading to potential peak flow concerns. Besides potential low flow problems in the mainstem, the LFA has indicated that many tributaries may have low flow concerns because of sediment accumulation near the mouths of the tributaries. These tributaries include Langdon Creek, North Fork Kalama, and Jacks and Wolf Creeks (Wade, 2000).

Over 97 percent of the Kalama River subbasin is forested, with the balance in agricultural and other developed uses that are concentrated closer to its confluence with the Columbia River. Other than regulated point sources of pollution loading concentrated near the mouth of the river, most pollution loading in the subbasin is attributable to nonpoint sources resulting from forest management practices and residential development. Minor land use changes are anticipated in this subbasin; therefore, future sources of pollution loading will likely predominate from timber management, stormwater runoff from roads, and other diffuse nonpoint sources of pollution. The Level I Technical Assessment concluded that:

"... In general water quality of the river system is in good condition and improving, as the lands that were logged in the 1970s and 1980s have been reforested and the road

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maintenance practices have improved... The lower reaches of the Kalama River is {sic} at some risk {of water quality degradation} due to conversion of land from forest to rural suburban use.”

The Kalama River subbasin is ranked as last priority for cleanup plans. Under the 1998 303(d) list only two waterbody segments are listed for violations of temperature standards in the Kalama River and its tributaries. However, limited water quality monitoring data are available for this subbasin. Therefore, more extensive water quality monitoring in the Kalama River subbasin would improve knowledge of ambient water quality status and trends.

Kalama River Watershed Basaltic andesite flows, Goble volcanics Composed mainly of rock with little alluvial deposits Low aquifer yield City of Kalama utilizes highly permeable sand and gravel deposits in the lower end of the watershed; the source is a Ranney Well drawing from below the Kalama River and may be subject to tidal influence. Very little information is available on ground water quality. The City of Kalama has records of pH, temperature, turbidity, inorganic and organic contaminants, nitrate, and radionuclides pertaining to their Ranney Well source. Water quality analysis performed for the City of Kalama indicated the presence of a shallow aquifer in the lower portion of the watershed near Kalama River is suitable for city use. The potential for ground water contamination exists due to a lack of a significant overlying confining unit.

North Fork Lewis River

Subbasin Characteristics Relevant to Stream Flow

This subbasin is particularly important to regional recovery by virtue of its large size and diverse habitats. It includes upper North Fork, lower North Fork, and East Fork watersheds. One or more populations of tule fall Chinook, bright fall Chinook, spring Chinook, chum, winter steelhead, summer steelhead, and coho are present. Lewis North Fork The North Fork Lewis River (North Fork) Subbasin has a drainage area of approximately 848 square miles and enters the Columbia River near the City of Woodland. The North Fork Subbasin is comprised of the Upper Lewis, Middle Lewis, and Lewis watersheds, as shown on Exhibit 2-2.

Unlike other areas in WRIAs 27 and 28, the North Fork Lewis River has dams and reservoirs that control flows. Merwin Dam blocks fish passage to 80% of the historic anadromous habitat (Wade, 2000). The dams are operated by PacifiCorp as the Lewis River Hydroelectric Project, and the operation of the project is regulated by a Federal Energy Regulatory Commission (FERC) license. Operational practices are described in Section 2.4.1 of this Watershed Management Plan. Flows on the North Fork are largely determined by these operational practices.

Population densities are generally low within the subbasin with the population center consisting of the community of Woodland. Thus, the major municipal and industrial water uses are also located at the downstream end of the Lewis River. Most of the subbasin's future development and water demands are likely to occur in this area as well. Scattered residential developments occur in the middle portions of the subbasin, while large portions of the subbasin are managed as commercial forest and are undeveloped except for logging roads. There is minimal water use in the headwater areas upstream of the PacifiCorp hydroelectric project.

The City of Woodland's withdrawals do not appear to significantly impact flows in the Lewis River. Even with projected growth, withdrawals are relatively small, in comparison with flows on the North Fork Lewis River. In addition, the location of the City's water intake near the lower end of the subbasin limits the extent of impacts on the

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river in terms of river miles. The reach of the Lewis River where the Ranney Well is located is in the zone of tidal influence. The City has submitted an application for additional withdrawals from its Ranney well on the Lewis River (see Section 3.4.6). Appendix G contains a description and map of existing surface water source limitations (SWSLs). There five administrative low flows or closures currently in place in this subbasin, restricting issuance of new water rights.

The lower North Fork flows through a wide flat valley which is mostly under cultivation and protected from flooding by dikes. The lower 7 miles are almost completely diked, while river miles 7 to 15 have been rip-rapped to protect residential and road development. The lower 11 miles are also tidally influenced.

Above river mile 15 the river is confined within a canyon. Above the dams floodplains that may have existed along the middle and upper reaches of the mainstem or the lower reaches of the tributaries have been inundated, in part, by reservoirs. The LFA indicated that riparian conditions are poor in most areas in the subbasin; however, South Fork Chelatchie Creek has numerous natural open areas of wetlands and prairies. Like the Kalama watershed, forest cover dominates the land use in the North Fork Lewis subbasin, with the U.S. Forest Service managing 61 percent of the watershed. Minimal human development or land use changes are anticipated in the middle and upper regions of the subbasin. Although the watershed is not presently listed as water quality impaired, temperature standards in the middle and lower reaches of the watershed are occasionally exceeded. For example, temperature data collected under the FERC re-licensing of Swift Power Plant No. 2 at the Swift dam indicates violation of standards. In general, water quality is improving in the subbasin after an extensive period of logging and road building; however, increased development pressure in the lower reaches of the watershed has the potential to degrade water quality and necessitates enforcement and enactment of proper water pollution controls. According to the Level 1 Technical Assessment: "These impacts may be in the form of increased sediment from land clearing and road building, loss of riparian habitat for shading and fecal coliform from on-site septic systems that are not properly installed or maintained."

North Fork Lewis River Watershed

Lower portion consists of Goble Volcanics, Upper Troutdale Formation and alluvial deposits. Upper portion consists of volcanic rocks of Cascade Mountains. Upper Troutdale Formation is used for domestic or irrigation purposes. Lower Lewis River Valley alluvial deposits capable of supporting large capacity irrigation or public supply well. City of Woodland has a large Ranney Well in the Columbia River sand and gravel deposits, which draws from below the Lewis River and is subject to tidal influence. Very little information is available on ground water quality in this watershed. The City of Woodland has records of pH, temperature, turbidity, inorganic and organic contaminants, nitrate, and radionuclides pertaining to their Ranney Well source. The potential for ground water contamination exists due to a lack of a significant overlying confining unit.

Land use: source from WRIA plan/ table 2.1 DOE GIS data

208,926 - forested

8,227 - agricultural

1,635 - urban/suburban/rural residential

218,788 - total

Population: from 2000 census and water purveyor data

Cowlitz

12,822 2000

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21,840 2020 demand

The geology within WRIsAs 27 and 28 can generally be divided into two regions. The entire north and eastern portions of the study area consists of the Cascade and Kalama volcanic rocks (basalt formations). This area includes most of the Kalama River subbasin, much of the Lewis River subbasin,

Water supply

Water is available for use in areas established as "regional supply areas." However, water is less available in areas of closure. In these areas, new water users must either:

- (1) Provide adequate mitigation during low flow periods (typically May through November).

- (2) Stop water use during periods of low flow.

- (3) Secure water from a deeper aquifer that does not impact flow limited bodies of surface water.

- (4) Connect to a public water supplier.

- (5) Change or transfer an existing water which they own, buy, or lease.

If eligible, these water users also have the option to secure water under the ground water permit exemption (RCW 90.44.050).s Although exempt from permitting, these uses remain subject to all other state water laws. They could even be regulated (forced to stop use) in the future if they impair senior water rights.

Surface Water Resources

The major river systems located within WRIsAs 27 and 28 are the Kalama, Lewis (North Fork

WAC 173-527 is the Water Resources Management Program for Lewis Basin, WRIA 27 Sets instream flows in Lewis Basin to protect instream values and functions from future appropriations. Also protects senior and junior water rights both surface and ground water sources from future changes and transfers. I sets reservations and appropriates water from those reservations.

The department of ecology has determined that there are certain surface water sources in the basin that there are no new reliably available new consumptive uses. Therefore, there are some surface water closures in the basin.

Ground Water Resources

The ability of the volcanic rocks to store and move water varies widely depending on the structure of the rocks. Minimal information is available on the ground water production of these units. However, ground water production is expected to be low, since very little sand and gravel overlies, or is present within, the rock formations. Essentially, ground water in the northern portion of the basin is not highly utilized because of the impervious nature of the rocks.

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The majority of water needs throughout WRIAs 27 and 28 are met by ground water supplies. All municipal and domestic water sources are ground water wells, with the exception of two creeks that provide a portion of the City of Camas' supply. The Cities of Kalama and Woodland obtain ground water through Ranney well systems, which tap shallow ground water sources adjacent to surface waters. ground water sources supply approximately 60 percent of the water required of self-supplied commercial and industrial facilities¹. Agricultural demands are met by a similar combination of ground and surface water supplies (i.e., 60 percent ground water, 40 percent surface water).

2.6 Water Rights

Water rights were inventoried by GeoEngineers during the Assessment Phase of the watershed planning process. The inventory was based on Ecology's Water Rights Application Tracking System (WRATS) database. Tables and maps summarizing water rights are presented in Appendix D.

2.7 Surface Water Quality

As required by section 303(d) of the federal Clean Water Act (CWA), each state must identify its polluted waterbody segments and submit a list of these water quality limited estuaries, lakes, and streams to the U.S. Environmental Protection Agency (USEPA). To qualify for the list, it must be determined through water quality monitoring that the waterbody segment does not meet state surface water quality standards and that water quality is not expected to improve within the next four years. The standards are the criteria to ensure that water may be beneficially used for multiple purposes such as fishing, swimming, drinking, and fish habitat.

Twenty-five waterbody segments in the WRIAs 27 and 28 planning area are on Ecology's 1998 303(d) list. A summary of these impaired waterbody segments and the parameters in violation of water quality standards are found in Table 2-7. This list should not be considered an exhaustive inventory of all segments in the study area with water quality impairments, as there is a lack of quality data quantifying water quality violations in many cases; rather, the list includes only those that were formally listed on the 1998 list.

2.8 Ground Water Quality

A variety of factors have the potential to contribute to the degradation in quality of ground water supplies, upon which many communities rely as a primary source of drinking water. Such factors include point and non-point pollution sources, shallow aquifer depth, and unprotected ground water supplies. Information on ground water quality is fairly limited in WRIAs 27 and 28. However, the information available suggests that, in most areas, water quality is currently in good condition in the primary aquifers used for drinking water supply³.

Portions of the lower 10 miles of the Kalama and Hatchery (Fallert) Creek are listed on the state's 303(d) list of impaired water bodies due to exceedance of water temperature standards.

Habitat Conditions

Kalama River Subbasin – The lower Kalama mainstem from the mouth to Dee Creek contains productive habitat for fall Chinook, chum, and coho. These reaches are primarily impacted by forest practices, though agriculture and rural development affect riparian areas and floodplains in the lowest reaches. The most effective recovery measures will involve riparian and floodplain restoration in the lower reaches, as well as addressing basin-wide forest and road conditions. The middle mainstem Kalama and major tributaries (i.e., Gobar Creek) contain productive habitats for steelhead and spring Chinook. Coho, fall Chinook, and chum do not typically ascend lower Kalama Falls to access these habitats. Forestry is the dominant land use surrounding these reaches. Stream-adjacent roadways impact riparian function. The most effective recovery measures will include preservation and restoration of riparian and upland forest and road conditions. The upper Kalama mainstem and tributaries (i.e., NF Kalama) are used primarily by summer steelhead. These reaches are heavily impacted by forest practices, and thus, the most effective recovery measures will include preservation and restoration of riparian and upland forest and road conditions.

Lewis River Subbasin – The most critical reaches in the lower Lewis River lie between Ross Creek and Merwin Dam. These reaches are most important for chum, fall Chinook, and coho. Winter steelhead also utilize these reaches. The middle mainstem basin is largely in private land ownership with some areas of state forest land. Hydropower operations, agriculture, and rural development have the greatest impacts. Effective recovery measures in the middle mainstem will involve managing regulated flows from the hydropower system, addressing agricultural and rural/suburban development impacts to floodplains and riparian areas, and ensuring that land-use planning effectively protects habitat and watershed processes. Also in the lower Lewis River, Cedar Creek reaches are most important for winter steelhead, though other species make limited use of these habitats. Lower Cedar Creek (mouth to Pup Creek) and the reach downstream of the Chelatchie Creek confluence are the most critical.

Forest practices on private commercial timber lands in the upper watershed have impacted sediment supply and hydrologic processes in Cedar Creek reaches. Agriculture and rural residential uses have impacted riparian areas and floodplains. Recovery measures will need to address agricultural impacts along stream corridors and forest practices in the upper basin.

Water Suppliers:

City of Woodland

The City of Woodland supplied water to a population of approximately 4,000 people in Cowlitz and Clark Counties in 2000. The City anticipates serving 6,933 people in 2020, with an average day demand of 1.28 mgd.

The City's single source of supply is a Ranney Well collector that withdraws water adjacent to the Lewis River. Similar to the City of Kalama, the Ranney Well collector is

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shallow and considered to be in direct connection to surface water. However, the Ranney Well is at a low point in the Lewis River watershed and is directly under the influence of tidewater. Therefore, the impacts upon stream flow by City diversions are overshadowed by the larger effects of tidal influence.

Since 1999, the City has operated a filtration/disinfection water treatment plant that addresses Surface Water Treatment Rule (SWTR) requirements as well as reducing aesthetic problems associated with dissolved iron concentrations in the raw water supply. The City's preferred plan to meet the water demands associated with future development is to expand its use of the Lewis River Ranney Well.

Recommendation: Increase Ranney Well withdrawals. The City of Woodland's Ranney Well is located within the tidal influence of the North Fork Lewis. The Planning Unit is not recommending protective measures in this reach. The Planning Unit supports expansion of the Ranney Well water supply.

City of Kalama

The City of Kalama supplied water to a population of approximately 3,000 people in 2000. These include residents of the City as well as some unincorporated lands in Cowlitz County adjacent to the City. The City anticipates serving 6,847 people in 2020, with an average day demand of 1.47 mgd. The City's single source of supply is a Ranney Well collector that withdraws water adjacent to the Kalama River. Similar to the City of Woodland, the Ranney Well collector is shallow and considered to be in direct connection to surface water. However, the Ranney Well is near the downstream end of the Kalama River watershed and impacts upon stream flow by City diversions are relatively small in comparison with flows at this location. The diversion location is slightly upstream of the zone of tidal influence on the river.

A diatomaceous earth water filtration plant provides required water quality treatment. Based on current demand projections, additional supplies may be necessary by 2016. To meet this need, the City is planning to expand its treatment plant capacity by an additional 900 gpm. The City has applied for additional water rights of 1.72 cfs on an instantaneous basis. Average flow on the Kalama River is 314 cfs in August.

Recommendation: Increase Ranney Well withdrawals. The Planning Unit endorses the City's plans to increase water rights for withdrawal from its Ranney Well of up to an additional 1.92 cfs subject to provisions outlined in Section 3.3.1. The Planning Unit recognizes that the purchase of off-setting water rights is not feasible in the Kalama River, and the 1.92 cfs of additional water rights is not subject to this provision; however, habitat mitigation requirements should be implemented commensurate with flow reduction impacts consistent with Section 3.3.1.

Municipal Systems

City of Woodland

Water System Description

The City of Woodland (City) supplied water to a population of approximately 4,000 people in Cowlitz and Clark Counties in 2000. The City developed an update of its Water System Plan in 1995. Information in this section was compiled from that plan, as well as

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from the Pre-Design Report for the City of Woodland Water Treatment Plant (1997), and interviews with City staff during the spring of 2002. The City's single source of supply is a Ranney Well collector that withdraws water adjacent to the Lewis River. The water rights associated with this source total 756 acre-feet/year on an annual withdrawal basis and 1,400 gallons per minute (gpm) on an instantaneous basis. Since 1999, the City has operated a filtration/disinfection water treatment plant that addresses Surface Water Treatment Rule (SWTR) requirements as well as reducing aesthetic problems associated with dissolved iron concentrations in the raw water supply, located outside of the City but within the Urban Growth Boundary. Based on historical growth patterns for the City's water service area (i.e., an average annual growth rate of 2.9 percent), the service area population is expected to increase to approximately 6,900 people by 2020.

Year 2000 average daily water production was on the order of 0.72 mgd, while maximum day production was approximately 1.59 mgd. Approximately half of the City's water usage is by commercial and industrial customers. Large non-residential water consumers include Northwest Pet, Hamilton Materials and Columbia River Carbonates, Brock's Oak Tree Restaurant, Save On Foods, Safeway, and Loomis. The water demand forecast in the City's water treatment plant pre-design report indicates that water production is anticipated to increase to approximately 1.139 mgd on an average daily basis by year 2016. The corresponding maximum day production forecast for year 2016 is 2.51 mgd. Utilizing the historic average annual growth rate of 2.9 percent, this demand forecast may be extrapolated to average and maximum day demands of 1.28 mgd and 2.81 mgd, respectively, by 2020.

The City has implemented a conservation program, key elements of which include the dissemination of public educational materials and a low-flow fixture replacement program.

Strategies for Serving Future Growth in Woodland

With an historic and projected average annual growth rate of 2.9 percent, the City of Woodland is planning on experiencing substantial growth over the next 20 years. While keeping its source of supply options open, the City's preferred plan to meet the water demands associated with future development is to expand its use of the Lewis River Ranney Well. While the new treatment plant has been designed to accommodate this growth in demand, the City faces the challenge of obtaining adequate water rights to support its growth. Comparison of the City's projected water demands with its existing water rights reveals that average daily demands are near the full amount associated with the City's annual water right. Furthermore, the City's instantaneous water right will likely be exceeded by maximum day demands by 2010. To address this situation, the City has filed two applications for new water rights with the Department of Ecology (Ecology). The first application, which was originally filed in 1995 and has been confirmed by Ecology, requests that the City's annual withdrawal be increased to 1,200 acre-feet/year. A more recent application was filed in 2001 and requests an increase in the City's allowed instantaneous withdrawal from 1,400 gpm to 2,100 gpm. Resolution of these water right applications is needed to ensure the City is capable of providing for future water demands.

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City of Kalama

Water System Description

The City of Kalama (City) supplied water to a population of approximately 3,000 people in Cowlitz County in 2000. The City completed an update of its Water System Plan in early 2002. Information in this section was compiled from the draft plan and interviews with City staff. The City's single source of supply is a Ranney Well collector that withdraws water adjacent to the Kalama River. The water rights associated with this source total 2,284 acre-feet/year on an annual withdrawal basis and 2,225 gallons per minute (gpm) on an instantaneous basis. Due to a 1998 DOH determination that the Ranney Well is a groundwater under the influence of surface water (GWI) source, the City has constructed a diatomaceous earth water filtration plant. The new plant, operational as of the end of June 2002, is designed with an initial capacity of 1,800 gpm, expandable to 2,700 gpm in the future. In addition to filtration, the City also chlorinates, fluoridates, and adjusts the pH of water from the Ranney Well.

The City provides water to customers located within city limits, as well as to customers located outside of the City. Based on historical growth patterns for the City's water service area (i.e., average annual growth rates of 2.4 percent within the City and 4.0 percent outside the City), the service area population is expected to increase to approximately 7,160 people by 2021.

Year 2000 average daily water production was on the order of 0.786 mgd, while maximum day production was approximately 1.451 mgd. Roughly 55 percent of the City's water usage is by industrial customers, primarily located at the Port of Kalama. Large water consumers include IMSA Coated Steel Corporation, Novian, Chemtrade, RSG, Kalama Export, United Harvest and Gram Lumber. The water demand forecast in the City's water system plan indicates that water production is anticipated to increase to approximately 1.516 mgd on an average daily basis by year 2021. The corresponding maximum day production forecast for year 2021 is 2.805 mgd.

The City has implemented a conservation program, a key element of which is the dissemination of public educational materials via newsletters and a web-site.

Strategies for Serving Future Growth in Kalama

As mentioned above, the City's new water treatment plant is designed such that it may be expanded by an additional 900 gpm in the future to meet needs imposed by growth. Based on current demand projections, such expansion may be necessary by 2016. In order for the City to expand its treatment plant and continue to utilize the Ranney Well as its sole water supply, an additional 475 gpm of instantaneous water rights will be needed in the future. The City has adequate annual and instantaneous water rights to meet projected demands through 2021; however, the existing instantaneous water right will be less than the expanded treatment capacity by that time. The City is planning for the additional treatment capacity, and associated water rights, in order to account for the potential of the Port of Kalama's water use increasing substantially if a new large industrial user locates at the Port. If such industrial growth does not occur, the treatment

plant capacity and water rights will serve to accommodate future growth beyond 2021. The key challenge facing the City relative to water supply is securing additional water rights to accompany the planned treatment plant expansion. The City has filed an

application for new water rights associated with its existing Ranney Well withdrawal. This will continue to figure prominently in the ability of the City to provide for future water demands beyond 2021.

Small Public Water Systems

State law defines a “public water system” as “any system providing water for human consumption through pipes or other constructed conveyances, excluding a system serving only one single-family residence and a system with four or fewer connections all of which serve residences on the same farm.” Under this definition, even wells supplying only two houses are designated as public water systems.

The Washington State Department of Health (DOH) regulates public water systems under two main categories. Group A systems are those systems regulated under the federal Safe Drinking Water Act (SDWA). Group B systems are regulated under State law, but are not regulated under SDWA. Typically, county health districts are delegated the regulatory role for Group B systems, while the State DOH performs regulatory responsibilities for Group A systems. Group A and B categories are described further, below.

□ Group A, Community water systems provide water to 15 or more service connections used by year-round residents for 180 days or more in each calendar year. Community water systems may serve cities, individual subdivisions, mobile home parks, and other types of communities.

□ Group A, Non-community water systems provide water to the public, but not to residential communities. DOH regulates two sub-categories: “transient” and “nontransient.” Examples include campgrounds, restaurants, motels, schools, day-care centers, and some businesses.

□ Group B systems are systems that meet the definition of a public water system, but do not fall into one of the categories listed above. For example, these include systems serving smaller communities or subdivisions ranging from 2 to 14 residential service connections.

Management techniques

Stream Closures, Minimum Instream Flows, and Water Right Reservations

This management technique involves placing restrictions on issuance of new water rights by the Washington State Department of Ecology (Ecology). This approach is designed to protect stream flows from new appropriations of water. This can be accomplished with stream closures, adoption of minimum instream flows, or both. These restrictions affect only the issuance of new water rights; existing uses of water and other watershed factors that influence flow are not affected by this action. Furthermore, this approach is designed to manage only low flow conditions, not peak flows.

A stream “closure” means that Ecology will deny any future applications for water rights from that stream and all its tributaries. This includes applications for surface water rights, and applications for ground water rights that could affect flows in the stream.

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“Minimum instream flows” are different from closures. With minimum instream flows an applicant can receive a new water right. However, their use of the water right must cease whenever the flow in the stream falls below a certain level at a prescribed control point (this would typically occur during the summer months). As a practical matter, this requires monitoring of stream flow and issuance of notices or orders to these water right holders by Ecology when flows drop below the prescribed level.

Some minimum instream flows and closures have been established by Ecology already through administrative actions in WRIs 27 and 28. These administrative low flows and closures lists are referred to as Surface Water Source Limitations (SWSLs).

WRIA 27 Planning Objectives:

I. Objectives to Protect or Enhance Conditions in the Watershed

- Effectively and efficiently manage water to ensure availability, reliability and predictability for beneficial uses over the long term, considering ongoing changes in population, local economies, and water-use technology.
 - Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages
 - Protect surface water quality for designated uses, with an emphasis on protection of aquatic biota, including fish species in their various life stages.
 - Protect surface and ground water needed for public drinking water supplies.
 - Maintain productive habitat and enhance degraded habitat forming processes for indigenous fish species in all life stages.
 - Protect and enhance wetlands and floodplains, with associated benefits for flows, water quality, ground water recharge and flood control.
- Effectively and efficiently manage water to ensure availability, reliability and predictability for beneficial uses over the long term, considering ongoing changes in population, local economies, and water-use technologies.
- Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages.
- Protect surface water quality for designated uses, with an emphasis on protection for aquatic biota, including fish species in their various life stages.
- Protect surface and ground water needed for public drinking water supplies.

Policies for managing water supplies:

Policy

WSP-1:

Public and private water users throughout WRIs 27 and 28 should have access to water resources to meet new or expanded needs for water supply consistent with adopted land use plans.

Policy

WSP-2:

Water resource development to meet new or expanded needs should avoid or minimize effects on stream flows or aquatic habitat in stream reaches where flow conditions are an important factor for sustaining aquatic life, including fish populations in their various life stages.

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To put these policies into operation, the Planning Unit reviewed a range of water management strategies. These strategies included development of new surface or ground water supplies; water conservation; water reclamation and reuse; voluntary transfers of water rights; aquifer storage and recovery; and surface water storage.

PacifiCorp operates the Lewis River Hydroelectric Project. Operations of this project, including releases designed to support stream flows in the Lower Lewis River Basin, are determined by the FERC license for this project. The Planning Unit acknowledges the importance of management of these facilities. However, the Planning Unit determined it should not duplicate the analysis and procedures related to FERC licensing. Therefore, the Planning Unit has not reviewed or analyzed Project operations.

In general, the Planning Unit recommends that new urban or suburban developments or industrial facilities that require new or expanded water supplies shall seek to obtain water from existing municipal or other water suppliers rather than developing separate sources of supply. (Note: this would not apply to agricultural uses). If an existing municipal supplier or other water supplier is not available, then the new development or industrial facility should explore water supply sources that are not in hydraulic continuity with surface water or explore the feasibility of developing tidal and/or Columbia River sources. If none of these options are available, Ecology may consider issuing water rights that entirely off-set the net impact to stream flow.

In those cases where new supplies are required for small Group A systems, it is recommended that a review of alternative sources of supply be conducted (see Section 3.3.1), with an emphasis placed upon evaluating the purchase of water from an existing major water purveyor (see Section 3.3.3). If new sources are required and a reserved block of water is not available, then the net impact to surface flows should be off-set by acquiring existing upstream water rights.

Recommendation
(Pg 3-33)

New supply –
agriculture

The Planning Unit does not endorse the use of surface water for meeting additional future agricultural water demand.

Recommendation
(Pg 3-33)

Existing supply –agriculture

The Planning Unit encourages agricultural water right holders to request changes of existing surface water rights to ground water rights not in hydraulic continuity with surface waters. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.

Recommendation
(Pg 3-33)

Transfer of
Agricultural
Water Rights

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Given the availability of existing water rights, the Planning Unit endorses the transfer of ground water rights from one user to another to meet future agricultural water demands. To promote the public interest, the Planning Unit encourages the Department of Ecology to expedite processing of agricultural ground water right transfers between agricultural water users.

Recommendation
(Pg. 3-33)
Agricultural –
new ground water
supplies

The Planning Unit recommends that Ecology process water right requests pertaining to future agricultural ground water demand, subject to consistency with the Planning Unit’s water supply policy (Section 3.3.1) and successful completion of Ecology’s water right application review process.

Sewer Extensions

When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, jurisdictions should consider the water balance implications of allowing extension of sewer service to developing areas. The Planning Unit recognizes that provision of sewer service can provide substantial water quality benefits. However, where sewer service is extended to replace septic systems, and residents continue to rely on water wells, stream flows may be reduced. This effect should be anticipated and mitigated where applicable. This is particularly important in areas with relatively dense development near small streams.

Land USE criteria for protecting groundwater:

Land use and hydrogeologic screening criteria could be applied to a ground water quality database to rank the susceptibility of all ground water supplies. Land use and hydrogeologic screening criteria that could be used to delineate “at risk” supplies include:

- Presence of Washington State Department of Ecology or United States EPA regulated facilities and sites
- Presence of domestic on-site septic systems (i.e., unsewered areas)
- Presence of land application of untreated, non-domestic wastewater
- Presence of concentrated animal feeding operations
- Presence of agricultural operations requiring frequent fertilizer and pesticide application
- Presence of untreated stormwater dry wells above some specified threshold density
- Presence of mining activities
- Presence of wells above some specified threshold density
- Presence of shallow wells (e.g., less than 100 feet below ground surface)
- Presence of unconfined, shallow aquifers (as described in the Level 1 Assessment) in which a shallow well could be completed
- Presence of regional aquifer recharge area
- Presence of water quality monitoring exceedances attributed to human causes

Objective 4: Implement Management Strategies to Minimize Impacts of Land Use Activities on Ground Water Quality

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Purpose: Prevent degradation of ground water supplies by various land use activities.
Rationale: A variety of land use activities can act together as non-point sources to impact ground water supplies. It is more efficient and cost-effective to prevent land use activities from impacting ground water supplies than attempt to clean up ground water supplies after they have been impacted. One approach for preventing ground water

SWISL on Kalama R.

27-6 Kalama River Low flow of 700 cfs from Nov-April; 700 to 375 cfs April-May; 375 cfs May-Sept; 375 to 700 cfs Sept-Nov. Within Section 33, Township 7 North, Range 1 West. This restriction has been in place on the Kalama River since the Department of Fisheries letter

HABITAT

The WRIA 27 watershed plan calls for reservations, for domestic and some other uses shown in Table 1.

Table 1. Reservations in WRIA 27 by Sub-basin

Sub-Basin Reserve

(cubic feet per second)

Kalama River 2.6

North Fork Lewis River 1.76

East Fork Lewis 2.85

Fish stock conditions in WRIA 27, based on the WDFW Salmonid Species Inventory (SASI) escapement record are shown in Table 2, below.

Table 2.

WRIA 27 Salmonid Species Population Condition by Basin (SASI 2000 listing)

Species Kalama North Fork Lewis East Fork Lewis

Spring Chinook Depressed Depressed Depressed¹²

Fall Chinook Healthy -- --

Tule fall Chinook -- Healthy --

Summer steelhead Depressed Unknown Unknown

Winter steelhead Healthy Unknown Depressed

Coho Unknown Unknown Unknown

¹² A few North Fork Lewis River Spring Chinook spawn in the East Fork, so the North Fork listing was used. Sept 5, 1974. 303d impaired water from temp

GOALS, POLICIES, ETC SECTION

The watershed plan recognizes regional water supply areas where water is potentially available on a year-round basis for future ground water withdrawals. These areas are not likely to affect protected instream flow values and should be considered as areas to support future development.

Observations:

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Erodible soils

Vegetation removal from logging activities

Road densities (?) area of impervious surface

Areas of soil instability throughout basin

Bank stability is generally considered good throughout basin- problems exist on mainstem just upstream and downstream of Spencer Creek (RM 2.2), mass wasting problems along Hatchery Creek, Wild horse Creek, Gobar Creek, NF Kalama.

Large slide on NF Kalama

Hydrological conditions are impaired – likely to remain over next 20 years. Reasons are low levels of public land ownership – land ownership is predominately private timber holdings, residential, some ag development along mainstem. Road densities are high, mature forest cover is low, likelihood that timber harvest activities are likely to continue and road densities likely to remain high or get higher in foreseeable future.

Lower Kalama more complex – it has been disconnected from its floodplain, growth pressures in lower mainstem area are increasing along I-r corridor. Existing high road densities, potential for timber harvest =, potential for future development in low-lying areas, sources of degradation.

Development continues to pose challenges for restoring important floodplain and side channel habitat.

ROADS

Parks & Recreation

Pacific Corp operates 14 parks and day –use facilities along Lewis River and on the shores of Merwin, Yale, and Swift reservoirs

WRIA 27 Special Purpose Districts (taxing authority)

Port of Kalama

Port of Woodland

Yale Valley Library District

Vancouver Regional Library (Woodland)

Fire District #5 (Kalama)

Fire District #7 (Cougar)

Cemetery District #2 (Woodland)

Cemetery District #5 (Kalama)

School District No. 402 (Kalama)

School District No. 404 (Woodland)

Woodland Swim and Recreation District

Special Purpose District list

In accordance with R.C.W. 84.52.020 transmittal of the the Taxing District Budgets for: Cities of Castle Rock, Kalama, Kelso, Longview and Woodland; Ports of Kalama, Longview, and Woodland (pending receipt); Library Districts of Yale Valley Rural Library District, Ft. Vancouver Regional Library (Woodland), and Rural Partial-County Library District; Fire Districts of Fire District #1 (Woodland),

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Cowlitz 2 Fire and Rescue (Kelso/Longview), Fire District #3 (Toutle), EMS #3, Fire District #5 (Kalama), Fire District #6 (Castle Rock), Fire District #7 (Cougar), Cemetery Districts of Cemetery District #1 (Castle Rock), Cemetery District #2 (Woodland), Cemetery District #3 (Toutle), Cemetery District #4 (Ostrander), Cemetery District #5 (Kalama), Cemetery District #6 (Rose Valley), Cemetery District #7 (Stella); School Districts of School District No. 122 (Longview), School District No. 130 (Toutle), School District No. 401 (Castle Rock), School District No. 402 (Kalama), School District No. 404 (Woodland), School District No. 458 (Kelso); Cowlitz Transit Authority (pending receipt), Public Facilities District, Public Utility District (PUD), Mosquito Control District of Cowlitz County, State Levy (not yet submitted), Woodland Swim and Recreation District, and 690-CDID #1.