SAN JUAN COUNTY
HEARING EXAMINER

FINDINGS, CONCLUSIONS AND DECISION

Applicant:	1281 & 1657 Yacht Haven LLC c/o Wayne and Gayle Laufer
Agent	Francine Shaw PO Box 2112 Friday Harbor, WA 98250
File No.:	PSJ000-14-0001
Request:	Shoreline Substantial Development Permit
Parcel No:	462650027
Location:	San Juan Island
Summary of Proposal:	Bulkhead
Shoreline Designation:	Rural Residential
Hearing Date:	3/12/14
Application Policies and Regulations:	San Juan County Shoreline Master Program
Decision:	Approved subject to conditions.

BEFORE THE HEARING EXAMINER FOR THE COUNTY OF SAN JUAN

Phil Olbrechts, Hearing Examiner

RE: 1281 and 1657 Yacht Haven, LLC Shoreline Substantial Development Permit (PSJ000-14-0001)	**FINDINGS OF FACT, CONCLUSIONS OF LAW AND DECISION.**

INTRODUCTION

The Applicants propose a 38 foot extension of a bulkhead located on adjoining property on San Juan Island. The application is approved subject to conditions.

This has been an extremely difficult proceeding. The applicants and Friends of the San Juans ("FOSJ") both had very strong and legitimate interests at stake that were at cross-purposes. Both parties brought forth very compelling evidence. The difficulties of the case were exacerbated by the fact that the types of evidence presented by both sides were not easily comparable. FOSJ brought forth scientific studies that proved fairly conclusively that bulkheads in general create significant impacts on shoreline resources. In response, the applicants produced several site specific studies that made good arguments that the general problems associated with bulkheads don't apply to them. The FOSJ evidence suffered from lack of project site access. The applicant studies suffered from short study periods and lack of objective peer review. Ultimately FOSJ simply could not overcome the site specific observations and site work put together by the applicants' experts.

It is important to recognize that the stability of a home was at stake in this case. The recent landslide devastation in Snohomish County shows the importance of protecting homes from landslide activity. The applicants made a very strong showing that the proposed bulkhead was necessary to protect their home. Indeed, the simple fact that they've doggedly continued to seek approval of their bulkhead despite the fierce opposition of FOSJ shows that they sincerely believe their home must be in danger. There is no other apparent rational reason why they would go through this permitting ordeal.

The evidence that the bulkhead will not harm the shoreline environment is not as compelling as the need to protect the Laufer residence. In particular, the findings in this decision that the bulkhead in conjunction with sea level rise will not significantly affect surf smelt habitat are certainly open to debate. The speculative nature of predicting specific sea rise rates over the next hundred years and the wide range of tidal elevations for surf smelt spawning ultimately did not support a finding that surf

smelt spawning would likely be harmed by the proposal. Sea level rise data is difficult to apply at the permit review stage of development. That type of scientific evidence is more appropriately and effectively integrated into shoreline regulations. It appears that San Juan County has recently made some headway at that level of land use control.

Although some may disagree with the conclusions on environmental impacts in this decision, it also needs to be recognized that the County's shoreline polices appear to allow for some environmental impact for bulkheads necessary to protect single-family homes. The bulkhead specific shoreline policies and regulations do not require bulkhead applicants to establish no adverse environmental impacts. In fact, Policy 3.6(D)(2) provides simply that "*[b]ank stabilization should be allowed for prevention of damage to existing development.*" Policy 3.4(C)(1), which addresses general environmental impacts, doesn't prohibit all impacts but simply enunciates the goal to "minimize" the adverse environmental impacts of shoreline development. In this regard the regulations appear to contemplate assuming some environmental harm if necessary to protect a single-family home. For those that disagree with the environmental findings of this decision, the importance of protecting the Laufer residence cannot be overlooked.

TESTIMONY

A summary of the testimony of the exemption and shoreline permit hearings for the proposal is attached as Exhibit A.

EXHIBITS

Exhibit 1 Staff Report
Exhibit 2 Request for Review
Exhibit 3 Application w/ Ms. O'Day's letter, site plan, email from Chris Laws, Letter from Earth Solutions
Exhibit 4 Habitat Management Plan dated Feb 25, 2014
Exhibit 5 FEMA email chain through March 11, 2014
Exhibit 6 San Juan County FEMA policy
Exhibit 7 Administrative Record of the exemption appeal PAPL-13-0001.
Exhibit 8 Hearing Examiner Correspondence with exemption parties regarding procedure of the hearing (entire chain)
Exhibit 9 Comment letter from FRIENDS of San Juan
Exhibit 10 Francine Shaw letter with revision to Habitat Management Plan terminology
Exhibit 11 Adopted map for San Juan County showing flood plains.

The primary source of exhibits in this case are the exhibit notebooks submitted into the record of the exemption appeal by the applicants and Friends of the San Juans

("FOSJ"). The exhibits in the applicants' notebook will be referenced as Exhibits L-A through L-BB. The exhibits in the FOSJ notebook will be referenced as Exhibits A-1 through A-52.

FINDINGS OF FACT

Procedural:

1. Applicant. The applicant is 1281 and 1651 Yacht Haven LLC, referred to as "Laufer" in this decision.

2. Hearing. The Hearing Examiner conducted a hearing on the subject application on March 12, 2014. The hearing was left open through March 14, 2014 in order to provide the Friends of the San Juan an opportunity to review and comment on an environmental analysis completed for FEMA. The applicant responded to the FOSJ comments on March 15, 2014.

Substantive:

3. Project/Site Description. The applicants request a shoreline substantial development permit to extend a bulkhead onto their property that will result in the complete hard armoring of a 400 foot pocket beach. The applicant's portion of the bulkhead at its lower tier is 38 feet long. The remaining portion of the bulkhead extends across two shoreline lots owned by the Woodmans, which immediately adjoin the applicants' property to the north.

The applicants state that the purpose of the bulkhead is to protect their existing single-family residence, which accesses the shoreline by a set of stairs. The home is located about 25 feet from the top of the shoreline bank and its deck is about ten feet from the bank. The bank is about 25 feet high. The bank is not considered a feeder bluff. The Laufer beach is not in a drift zone.

The applicants describe the bulkhead extension as a two-tiered rockery structure. They assert that the upper tier is necessary for the functionality of the lower tier, which is located at the toe of the shoreline banks on their lot. The upper and lower tiers connect to the upper and lower tiers of the Woodman bulkhead, which adjoins the subject property to the north. The lower tier of the Laufer extension[1] will be 38' long, and lies just landward of the ordinary high water mark ("OHWM"), which is the toe of the slope for the Laufer property. The bulkhead's southerly end terminates at exposed bedrock on the shoreline bank. The upper tier of the Laufer extension will be 55' long, extending from its connection to the upper tier of the Woodman portion of the bulkhead on the applicants' northerly property line. It is shown bisecting the

[1] Since the Woodman and Laufer bulkheads were determined to be a single-bulkhead in PAPL-13-0001, the applicant's portion will be called the "Laufer extension" and the Woodmans' portion will be referenced as the "Woodman portion" of the bulkhead.

stairs and terminating about 2/3 of the way to the southerly property line. The upper tier is more than 10' away from and higher in elevation than the lower tier located near the water. It is physically separate from the lower tier.

4. Characteristics of the Area. Adjoining the subject lot to the north is shoreline property owned by the Woodmans. The immediately adjoining Woodman lot is vacant. The shoreline lot immediately to the north of the Woodman vacant lot is also owned by the Woodmans and is developed with their home. The two-tiered bulkhead structure on the adjoining vacant Woodman lot has not yet been fully constructed.

The bulkhead on the Woodman vacant lot is an 80 foot extension of an existing rock bulkhead located on the developed lot to the north. The extension onto the vacant lot constitutes the Woodmans' fourth successive bulkhead development that commenced at the developed Woodman lot. *See Woodman Examiner decision*, PSJ000-12-0015, FOF No. 3. The first portion of the Woodman bulkhead, at the northern extreme of the developed property, was approved and constructed in1997 via a shoreline exemption. The bulkhead was extended 50 feet to the south in 2006. A further 100 foot extension to the south was constructed in 2009 onto the undeveloped Woodman lot. The fourth 80 foot extension was approved in 2013 and is currently under appeal to the Shoreline Hearings Board. The applicants' extension will connect to the Woodman extension currently under appeal.

The Laufer extension is located in a pocket beach approximately 400 feet long. See applicant exhibit notebook, tab K, 10/23/13 site plan. Approval of the Laufer extension would result in the complete armoring of the pocket beach. Prior to the shoreline exemption application, FOSJ designated the pocket beach as among the three highest priority miles of shorelines in San Juan County due to the existence of surf smelt spawning habitat, Pacific herring spawning in near shore eelgrass, and juvenile salmon.

The currently proposed bulkhead extension was originally administratively approved as an exempt bulkhead. The exemption decision was appealed by the Friends of the San Juan. The decision on appeal determined that the bulkhead was not in fact exempt, because it constituted an extension of the Woodman bulkhead. See PAPL-13-0001. This application is in response to the administrative appeal decision.

5. Adverse Impacts. As conditioned, the proposal will not create any significant adverse impacts. The specific impacts of the proposal are addressed below:

A. Beach Erosion/Impoundment. The primary adverse impacts of bulkheads are disruption of beach sedimentation by impoundment of soils behind the bulkhead and erosion at the toe and un-rocked ends. Disruption of beach sedimentation is a significant environmental impact for several reasons, including that forage fish, used as a prey resource for endangered salmon, spawn on these sediments. See Ex. 20, p. 2, Ex. 22. In this case the applicants have established that their proposal will not

impound any significant amount of soils that nourish the Laufer beach or cause erosion that will remove beach sediment.

The applicants have conclusively demonstrated through scientific literature that bulkheads disrupt beach sedimentation. As explained in one University of Washington study, bulkheads disrupt beach sedimentation by impounding the soils of banks that erode into a beach and also by reflecting wave energy, which in turn washes beach soils out to sea. Ex. 20, p. 2. However, the University of Washington study did concede that these impacts are inferred and that "*there is little specific local research providing quantitative information on effects of shoreline modifications on priority habitats and species*." In an Alabama study, it was noted that "*it has long been understood by the coastal engineering community that building a seawall along a receding shoreline will lead to the loss of the sandy beach in front of the wall*". A set of guidelines prepared by the Aquatic Habitat Guidelines Program, a multi-agency committee within Washington State, agreed that bulkheads create these impacts, as did a best available science report prepared specifically for San Juan County and a study prepared for the Washington State Department of Ecology. See Ex. A-23, A-25, A-28. The best available science report rates shoreline modifications (including bulkheads) as the third highest threat to the County's marine environment. See Ex. A-25, p. 46. However, the best available science report did note that "*the specific localized effects of bulkheads have not been thoroughly identified in San Juan County.*"

The general conclusions of the preceding studies have been supported by site specific studies. A study in Wales measuring wave energy and sediment suspension in front of an armored and adjoining unarmored beach confirmed that waver energy was reflected by the bulkhead and that this energy resulted in greater sediment transport (erosion).

The applicants establish by their own project specific studies that the generalized findings of the FOSJ studies do not apply to their project area. This is accomplished by three studies. One is a Coast and Harbor study, Ex. L-K. In this study Coast and Harbor compared the sediment in front of the armored Woodman property against the adjoining unarmored property in 2009, three years after the bulkhead was constructed on the armored portion. Coast and Harbor found no significant difference in the sediment. The Coast and Harbor study also compared photographs of the beach taken at the time of the 2009 Woodman extension with photographs taken in 2013 and determined that "*the beach in front of the 2009 bulkhead extension did not show progressive change since the time the bulkhead had been extended.*" Similar results were made in a second Coast and Harbor study, Ex. L-R, which included comparisons of beach features for time periods up to 48 months. Mr. Simpson, one of the authors of the report, explained that the bulkhead doesn't increase beach erosion because the existing bank creates the same type of erosion.

At hearing Mr. Johannessen expressed the opinion that the three and four year time periods of the Coast and Harbor studies were not a sufficient period of time to see any observable change in substrate. However, he offered no evidence to back this position. Mr. Simpson acknowledged that three and four year studies are not sufficiently long to assess long-term effects, but that if a bulkhead impacts a beach

the changes would be immediately recognizable since a bulkhead has immediate impact on the equilibrium of beach processes.

The second study, Ex. L-J, was prepared by Stephen Belluomini, an engineering geologist. Mr. Belluomini took soil samples of the beach in front of the Laufer property and compared them to soils in the Laufer shoreline bank. He found that the soils were not the same and that the Laufer bank did not contribute to the sediments of the Laufer beach. Mr. Belluomini speculated that the soil deposits in the Laufer beach originated from the Frasier River, basing his conclusions on a study by Sophia Johannessen that determined that the Fraisier River transports a large amount of sandy material into Haro Pass. Since the Laufer property is in proximity to Haro Pass, Mr. Belluomini concluded that those sands are likely deposited on the Laufer beach.

As previously noted, comparing the evidence presented by the applicants and FOSJ is an apples to oranges exercise. As identified above, many of the studies presented by FOSJ freely acknowledge that more site specific studies are necessary to delineate the impacts of a specific bulkhead proposal. The applicants provide those site specific studies. However, the short duration of the Coast and Harbor studies seriously undercut their credibility. Mr. Belluomini's soil samples are more compelling, especially given the fact that FOSJ was not able to present any explanation for the lack of correlation between bank and beach soils. However, Mr. Belluomini's conclusions as to the source of the Laufer beach soils appears to be fairly speculative without the benefit of a sediment transport study that addresses potential soil depositions on the Laufer beach. Mr. Belluomini's conclusions in this regard were also disputed by another of the applicants' own witnesses, David Simpson. Ms. Simpson testified that the Frasier River was not his first choice for the source of the Laufer beach substrate and that it could come from the bottom of the pocket beach or Haro Strait.

On balance, Mr. Belluomini's soil samples are the most compelling evidence regarding the issue of soil impoundment. His soil sample evidence was essentially left uncontested. The Coast and Harbor observations on erosion impacts are less compelling, but they do constitute the only site specific evidence on bulkhead erosion impacts. The well-qualified Coast and Harbor engineers determined that these observations were sufficient to conclude that the bulkhead would "*produce no detectable changes in hydrodynamics that are reflected in size characteristics of intertidal beach sediment*" and that "*[s]urf smelt spawning habitat is inferred to be unaffected by the proposed beachhead*". Mr. Belluomini and Mr. Simpson both acknowledged that the bank provides a trace amount of nourishment, but not in any quantities that make an environmental difference. It is also noteworthy that edge erosion is not a factor for the extension, since the Woodman portion of the bulkhead is on one side and the bulkhead ties into a rock cropping on the other. The conclusions of Coast and Harbor certainly would not satisfy any "clear and convincing" or "beyond a reasonable doubt" level of proof, but they are marginally sufficient to meet the "preponderance of evidence" or "substantial evidence" standard.

B. Loss of Vegetation. The proposal will result in a substantial loss of vegetation that currently exists on the Laufer shoreline bank, including the removal of

at least two trees. The conditions of approval will require the replacement of lost vegetation to ensure that no adverse impacts result from removal.

As Ms. Whitman testified, the removal of this vegetation will adversely affect surf smelt, salmon and Pacific herring along the shoreline by depleting a source of shade, habitat and insects. Ms. Whitman's comments are confirmed by two University of Washington studies. Ex. A-20, p. 2; Ex. A-22 (salmon eat near shore insects falling from riparian vegetation). The loss of shade leads to changes in the microclimate of the near shore area, which is correlated with a higher mortality in surf smelt embryos. Ex. 36.

Although Ms. Whitman and the studies presented by FOSJ present compelling evidence on the adverse impacts of vegetation removal, there is nothing to reasonably suggest that replacement of lost vegetation would not effectively reduce the impacts of losing that vegetation. The study on HPA mitigation evidences that generally HPA mitigation has not been effective in preserving fish and shellfish habitat and functions, but the study doesn't identify whether the benefits of preserving, rehabilitating or restoring marine vegetation was addressed. In fact, several mitigation measures were specifically identified in the study and no mention was made of any requirements pertaining to vegetation. See Ex. 34, p. 7. Another study presented by FOSJ in point of facts suggests that restoration, rehabilitation and enhancement would have substantial benefit. See Ex. 16, p. 15. A memo from the San Juan County Marine Resources Committee, Ex. A-37, does generally conclude that best available science does not support mitigation of marine habitats. However, the memo's conclusions are only based upon two studies addressing eelgrass transplantation and a study addressing wetland mitigation.

Francine Shaw testified that she has an expert on shoreline vegetation recommended by the San Juan Conservation District available to do a landscaping plan for the bulkhead. The conditions of approval will require the retention of such an expert[2] to prepare a landscaping plan that fully compensates for any loss in fish and shellfish habitat and functions caused by removal of the vegetation for construction of the bulkhead. This should adequately mitigate for any adverse impacts caused by removal of vegetation.

C. Sea-Level Rise. The most difficult issue to address for this project is sea-level rise. The evidence is very compelling that sea level rise will lead to a change in beach profile. However, there is no substantial evidence in the record to establish that the change in beach profile will likely adversely affect surf smelt spawning to any significant degree.

It is undisputed that sea level rise will lead to changes to the beach profile in front of the Laufer bulkhead. The applicant's Coast and Harbor report acknowledges that if left unarmored, the beach profile would migrate and landward at a rate equal to sea rise. See Ex. L-K, p. 7. Changes to beach profiles can lead to adverse impacts to surf

[2] This language should not be construed as a finding that Ms. Shaw's expert has all the expertise necessary to install the requisite vegetation. Whatever expert the applicants use will need to have sufficient background in biological sciences to understand the shoreline functions served by riparian vegetation and how to compensate for its loss.

smelt habitat, because armoring prevents beach migration inward, thereby reducing the area of beach with elevations amenable to spawning. See Ex. A-27, p.176.

Although there is little question that sea level rise will change the Laufer beach profile, the evidence is not compelling that this change will be significantly adverse to surf smelt spawning. This finding is in part based upon the determination that sea level rise is not as significant in San Juan County as asserted by FOSJ. The applicants assert and FOSJ experts concede that vertical movement of the San Juan islands caused by tectonic plate movement counteracts sea level rise and results in a lower rate of sea level rise than for other areas such as the City of Seattle. The applicants presented data from the Army Corps of Engineers that sea level rise over the next 100 years based upon straight line projections from 1934 for Friday Harbor only totals 4.5 inches. In her testimony Ms. Whitman, an FOSJ expert witness, agreed that the Army Corps projection was accurate to the extent it was based upon a straight line projection since 1934. There is nothing in the record to reasonably suggest that a rise of 4.5 inches will result in a significant loss of higher elevation beach spawning area.

FOSJ's primary response to the data presented by the applicants is that the long term rates of sea level rise are not indicative of higher more current trends. As noted in a 2012 study presented by FOSJ, global sea rise averaged 1.7 millimeters per year over the 20th century, but rose 3.1 millimeters per year from 1993-2003. See Ex. 18, p. 1-2. However, that study concludes that more data is needed in order to determine whether accelerated rates observed since the 1990s will continue. Id. at p. 2. The 2012 study determines that taking into consideration the factors contributing to the accelerated rates, the sea level is anticipated to rise by 24 inches by 2100 for the City of Seattle. As previously discussed, the sea level rise for the San Juan islands is significantly less than that in Seattle due to the tectonic plate movement. The straight line sea level rise rate for Seattle over the past century is 2.06 millimeters per year while that for Friday Harbor is 1.13 millimeters. See Ex. 19. If this proportionate disparity is extrapolated[3] to the 2012 study projections for Seattle, sea level rise for the islands (or at least Friday Harbor), would total 13 inches by 2100. If the projection to Friday Harbor is simply adjusted for a constant value of vertical land movement (0.7 millimeters per year, representing the difference in vertical land movement between Seattle and Friday Harbor as shown in Table A.1 of Ex. 12), the projected sea level rise for Friday Harbor would be 22 inches by 2100.

In a worst case, highly speculative scenario based upon data from the record, the sea level will rise 13-22 inches in front of the proposed Laufer bulkhead over the next 86 years. This could result in the elimination of some prime surf smelt spawning beach elevations. A study on surf smelt spawning elevations at several sites in San Juan County determined that the majority of surf smelt eggs were found at elevations of 7-8 feet. See Ex. A-31, p. 5. As conceded by Ms. Whitman during cross examination, few eggs in the study were found at elevations exceeding 8 feet. The bottom tier of the proposed bulkhead will be at an elevation of 8.4 feet. See Ex. L-A, "Proposed Site Development Plan" and "Proposed Bulkhead Cross Section".

[3] A proportionate extrapolation may not be appropriate since tectonic impacts have apparently not been accelerating in magnitude over the past recent years while climate changes have been accelerating.

Consequently, it is possible that near the end of the next 90 years the top elevation of the Laufer beach waterward of the proposed bulkhead may be below the ideal 7-8 foot elevations for surf smelt spawning if the loss of beach elevation in front of the bulkhead equals the rise in sea level. Given the Coast and Harbor study findings that the bulkheads do not erode waterward sediments, it may be fair to conclude that beach elevations will reduce at rates equal to sea level rise if the MLLW (which is set at elevation 0.0) rises at the same rate as sea rise. The highest elevations could conceivably be reduced from 8.4 feet to 6.5 feet by 2100.

Although the 7-8 foot elevation contains a large percentage of surf smelt eggs in a typical San Juan unarmored shoreline, the elevations from 4 to 6.5 feet still contain the majority of eggs from the Ex. A-31 sampling study, See A-31, Table 2 and 3. There is nothing in the administrative record to reasonably suggest that surf smelt who are prevented from spawning at the 7-8 foot levels would not simply spawn at a lower elevation without any reduction in survival rate of the eggs. Overall, it must also be recognized that the proposed bulkhead is only 38 feet in length. The impacts of the bulkhead are limited to lowering the highest beach elevations by a couple feet over a 38 foot stretch of shoreline. If surf smelt spawning is adversely affected to any significant degree by the loss of the upper beach elevations, there is nothing in the record to suggest that any relatively large number of eggs would be harmed in the small area affected by the bulkhead.

D. Surf Smelt/Endangered Salmon. The proposal will not adversely affect surf smelt or endangered salmon. FOSJ has presented several reasons why bulkheads will adversely affect surf smelt and salmon. Specifically, these reasons are (1) beach erosion, (2) sediment impoundment, (3) loss of vegetation (resulting in changes to microclimate, loss of nutrients and loss of habitat), (4) loss of beach elevation through sea level rise. None of these factors have been found to harm surf smelt or endangered salmon for the reasons outlined in the preceding findings of fact. It is determined that surf smelt and salmon will not be adversely affected by the proposal, given that there is no evidence of any other impacts that would result from the proposal.

Another impact not specifically addressed in the preceding findings of fact is whether the bulkhead will physically occupy surf smelt spawning habitat. Testimony by FOSJ confirms that surf smelt usually do not spawn above the OHWM or eight foot tidal elevations. In this case it is clear that the bulkhead will be placed both landward of the OHWM and above an 8 foot tidal elevation. It is determined that the bulkhead will likely not physically occupy any surf smelt spawning area.

FOSJ finds impacts to surf smelt highly significant because surf smelt spawning habitat is in short supply in San Juan County and surf smelt serve as an important prey resource for endangered salmon. There are roughly 408 miles of marine shoreline in San Juan County, and roughly 90 miles have suitable or potential surf smelt spawning beach. 10 miles have actual, documented surf smelt spawning, and, of the 10, between1.5 to 2 miles have been armored with bulkheads. Given the potential impacts of bulkheads and the limited amount of surf smelt spawning habitat, care must be taken that any additional bulkheads must not adversely affect the spawning habitat. In this case the applicants have succeeded in establishing that their bulkhead will not significantly harm the habitat, or at least will not significantly affect surf smelt spawning.

E. Cumulative Impacts. The San Juan County Council has recently adopted a set of more stringent bulkhead regulations. These regulations in part address many of the bulkhead impacts addressed by the FOSJ studies submitted into the administrative record of this proceeding. For this reason, the approval of this minor bulkhead application will not substantially add to bulkhead cumulative impacts, since under the new regulations it is less likely that similar proposals will be approved. Also, as detailed in the preceding findings of fact, the project area is characterized by geohydraulic processes that are atypical of what studies have found to occur at bulkheaded sites. The circumstances justifying the bulkhead of this application appear to be unique and would presumably not occur with any frequency even under the regulations to which this application vested.

6. Necessity of Slope Stabilization. The proposed bulkhead is necessary to protect the Laufer's single family residence.

The need for the same bulkhead along the same pocket beach has been confirmed by several County shoreline decisions and the Shoreline Hearings Board for the Woodman portion of the bulkhead. There is nothing to distinguish the need for a bulkhead in this case. Bob Levinson, a geological engineer, prepared a geotechnical report, Ex. –J, and testified that in his opinion the bulkhead is necessary to protect the Laufer residence. He noted that the slope had a history of instability, pointing out that two arc shaped slides had occurred on the adjoining Woodman property and that part of one of these slides had extended onto the Laufer property.

Mr. Levinson's findings were confirmed in the Coast and Harbor report, Ex. L-K, where Coast and Harbor found multiple landslide scarps in the Laufer/Woodman project area. Coast and Harbor determined that erosion was undercutting the toe of the bank, leading to slope failures that would threaten the Laufer home. The Coast and Harbor report confirmed that erosion is in fact slow at the pocket beach bluff, no more than six inches per decade. However, the Laufer home was still at risk because loss of bank was not a gradual process but would occur in large slope failures.

As a result of the winter months between the Laufer exemption appeal hearing and the hearing on this application, Stephen Belluomini observed an additional 1-2 inches of erosion at the toe of the bluff, which he characterized as a "precursor to renewed landslides". See SP Ex. 3, Belloumini 2/26/14 letter. In his geotechnical report, Mr. Levinson noted that the 30 degree bedding planes of the bank coupled with cohesionless soils, the height of the bank and groundwater conditions made further slides likely and that these slides threatened the integrity of the single-family home. Mr. Levinson further testified that one of the landslide scarps was steep and this created an unstable situation where the scarp would work its way up the bluff and threaten the Laufer home.

The testimony of James Johannessen on behalf of Friends of the San Juans was compelling. Mr. Johannessen, as a coastal geologist who has based most of his work in the San Juans, of all the hearing experts had the most directly applicable expertise on the slope stability of the Laufer shoreline bank. Mr. Johannessen testified that the erosion rate for the Laufer property was one of the slowest rates in San Juan County, probably below one inch per year. He based his conclusion on the fact that trees on the bank grew straight up, evidencing no significant slope movement. He also based

his opinion on a numerous photographs taken of the site over time. Photographs from 1997, 2002, 2006 and 2011 showed the bank as heavily vegetated, again evidencing no slope movement. Mr. Johannessen noted that shoals and buoys reduced wave energy at the site, thus further decreasing the likelihood of any significant erosion rate.

Despite Mr. Johannessen's significant expertise, the substantial and preponderance of evidence in this case still supports a finding that slope stabilization is necessary. Mr. Levinson presented site specific evidence regarding steep bedding planes and landslide scarps, soil cohesion and past slide activity (coupled with Mr. Belluomini's observations of very recent erosion) that were left unaddressed by Mr. Johannessen. There is no explanation provided as to why these indicia of slope instability should not be a concern, except Mr. Johannessen's observations that bank scarps are a common occurrence on San Juan County shoreline banks. In the same vein the applicants too failed to address Mr. Johannessen's site specific observations regarding vegetation growth. However, Mr. Levinson was able to both show evidence of historical slope failure as well as provide numerous explanations based upon project site geological characteristics as to why additional failures were likely. This level of detail was lacking in Mr. Johannessen's analysis.

Broader evidentiary considerations are even more compelling that a bulkhead is necessary. The fact that the applicants have chosen to undertake the significant time and expense of this application strongly suggests that they are very concerned about the integrity of their home. It is highly dubious that they would go to all this trouble to protect a few feet of landscaping in their backyard. The private advice that they must be getting from their consultants is likely not that different from the testimony they've presented at hearing – the Laufer home is in serious jeopardy if a bulkhead is not constructed. This line of reasoning is further corroborated by the testimony of Ms. Shaw in her cross-examination, where she responded that she has worked on 8-10 bulkhead projects with Bob Levinson and this is the first where he found that a bulkhead was necessary to protect a single-family home.

7. Necessity of Rock Bulkhead. Nonstructural shoreline stabilization is not an effective alternative to the bulkhead proposed by the applicants. Table 1 of the Coast and Harbor report, Ex. L–K, assesses the effectiveness of all alternative forms of shoreline stabilization. The proposed rock bulkhead is the only form or armoring (other than sheetpile) that will protect the home from extreme wave action. Significantly, the table also identifies that alternative forms of armoring would smother surf smelt habitat. The appellants provided no evidence to dispute the analysis of Table 1, other than the testimony of Mr. Johannessen that the table is based upon the assumption that stabilization is necessary. Given that Finding of Fact No. 6 determines that stabilization is necessary, it is determined that no other form of stabilization (other than sheetpile and presumably a concrete bulkhead) will provide adequate protection to the Laufer's residence.

CONCLUSIONS OF LAW

Procedural:

1. Authority of Hearing Examiner. The Hearing Examiner, after conducting an open-record public hearing, is authorized to issue a final decision on shoreline substantial development permits. SJCC 18.80.110(E).

Substantive:

2. Shoreline Designation. The subject property is designated as Rural Residential.

3. Comprehensive Plan and Zoning Designations. The subject property is designated as Rural Residential, and the existing land use is Residential.

4. Permit Review Criteria. SJCC 18.50.210 requires a shoreline substantial development permit for development of bulkheads. The proposed bulkhead is not exempt from this permit requirement because it is considered an extension of the adjoining Woodman bulkhead, as determined in San Juan County Hearing Examiner Decision PAPL-13-0001. SJCC 18.80.110(H) establishes the criteria for approval of shoreline substantial development permits. The criteria include the policies of the Shoreline Management Act (Chapter 90.58 RCW), the policies and use regulations of the San Juan County Shoreline Master Program, and the requirements of the San Juan Municipal Code and Comprehensive Plan. The applicable policies and regulations are quoted in italics below and applied through conclusions of law.

FOSJ asserts that the upper tier of the bulkhead is a separate retaining wall that can only be authorized through a conditional use permit. This decision only addresses whether the criteria for a shoreline substantial development permit are satisfied. Whether or not a conditional use permit is required for the upper tier of the bulkhead is a separate issue beyond the scope of this decision.

RCW 90.58.020 Use Preferences

This policy (Shoreline Management Act policy) is designed to insure the development of these shorelines (of the state) in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto.

5. The project will not interfere with public access to the shoreline or navigation and is not associated with any significant adverse impacts. The policy is met.

RCW 90.58.020(1)[4]
Recognize and protect the statewide interest over local interest;

6. The project will protect an upland residence while not creating any significant damage to the shoreline. The statewide interest is adequately protected.

RCW 90.58.020(2)
Preserve the natural character of the shoreline;

7. Natural character is preserved to the extent possible by the use of rock instead of concrete. Beyond this, softer armoring will not provide sufficient protection to this shoreline area due to the wave dynamics of the site as determined in Finding of Fact No. 7.

RCW 90.58.020(3)
Result in long term over short term benefit;

8. The project provides for preservation of the shoreline, which is a long term benefit to not only the property owner but to the public generally. The unique wave dynamics of the site prevent the bulkhead from creating any significant impacts and also prevent the creation of any precedent that would facilitate the proliferation of bulkheads to other shoreline areas of the San Juan Islands.

RCW 90.58.020(4)
Protect the resources and ecology of the shoreline;

9. As determined in Finding of Fact No. 5 there are no significant adverse impacts associated with the proposal.

RCW 90.58.020(5)
Increase public access to publicly owned areas of the shorelines;

10. The project does not pertain to a publicly owned area of the shoreline.

RCW 90.58.020(6)
Increase recreational opportunities for the public in the shoreline;

11. Since this is a private proposal with no pubic impacts no public recreation mitigation may be constitutionally imposed.

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[4] RCW 90.58.020(1)-(6) applies to shorelines of statewide significance. Section 3.4.F of the San Juan County Comprehensive Plan identifies all saltwater surrounding the islands of San Juan County as shorelines of statewide significance. The policies of 90.58.020(1)-(6) are mirrored in the policies of Section 3.4.F of the Comprehensive Plan and for the reasons provided in assessment of RCW 90.58.020, the Examiner also finds consistency with the policies of Section 3.4.F.

San Juan County Code Regulations

SJCC 18.50.210(A)(1): *No bulkhead to protect a single-family residence or appurtenant structures shall be constructed until the County has reviewed the proposed construction and determined that the project is or is not exempt from the shoreline permit requirements and is consistent with the policies of the SMA and this SMP.*

12. The proposed bulkhead is not exempt from shoreline permitting requirements as determined in San Juan Hearing Examiner Decision PAPL-13-0001. The proposal is consistent with applicable shoreline policies as detailed in this decision.

SJCC 18.50.210(A)(2): *Nonexempt bulkheads shall be permitted only when nonstructural shoreline protection, restoration, or modification techniques have been shown to be ineffective and it can be shown that one or more of the following conditions exists:*

a. Serious erosion is threatening an established use on the adjacent uplands;
b. A bulkhead is needed and is the most reasonable method of stabilizing an existing beach condition;
c. There is a demonstrated need for a bulkhead in connection with water-dependent or water-related commerce or industry in an appropriate environment;
d. A bulkhead is the most desirable method for stabilizing a landfill permitted under this master program.

13. Subsections (a) and (b) are met by the proposal. As determined in Finding of Fact No. 7, nonstructural methods of shoreline stabilization are not feasible due to the high wave energies of the site. As determined in Finding of Fact No. 6, serious erosion is threatening a single-family residence and a rock bulkhead is needed to protect it.

SJCC 18.50.210(A)(3): *Bulkheads shall not be permitted in conjunction with new projects or development when practical alternatives are available.*

14. The proposal is not associated with any new development.

SJCC 18.50.210(A)(4): *Bulkheads shall be permitted on marine feeder bluffs only where (a) a clear and significant danger to established development exists and (b) there is reasonable cause to believe that the bulkhead will in fact arrest the bluff recession and will not seriously disrupt the feeder action or the driftway.*

15. The subject bank is not a marine feeder bluff.

SJCC 18.50.210(A)(5): *Bulkheads constructed on Class I marine beaches shall be located behind the berm.*

16. The staff report notes that the subject beach is not a Class I marine beach.

SJCC 18.50.210(A)(6): *All bulkheads shall conform to the design requirements of the Washington Department of Fish and Wildlife, except where such design would be incompatible with protection of the shore process corridor and operating systems.*

17. As conditioned.

SJCC 18.50.210(A)(7): *Applications for bulkhead permits shall include at least the following information:*

a. Purpose of proposed bulkhead;
b. Low, normal, and high elevations, when appropriate;
c. Direction of net longshore drift, when appropriate;
d. Type of construction proposed; and
e. Elevation of the toe and crest of the proposed bulkhead with respect to water levels.

18. The application contains all of the required information.

SJCC 18.50.210(A)(8): *Bulkheads shall be prohibited for any purpose if it will cause significant erosion or beach starvation.*

19. As determined in Finding of Fact No. 5, the bulkhead will not create any significant beach starvation or erosion.

DECISION

1. The applicants shall obtain all other required permits and abide by the conditions thereof. All conditions of approval of the required hydraulic permit shall be considered conditions of approval of this permit.
2. The applicant shall have a qualified expert with a background in shoreline environmental science prepare a landscaping plan subject to approval of staff that assures the restoration of all pertinent shoreline functions for any vegetation removed or that will fail as a result of the proposal. At a minimum, the plan shall introduce native vegetation that fully restores any loss of riparian vegetative contribution to shading, nutrient or habitat functions as detailed in Finding of Fact No. 5(B). The landscaping plan shall include a five year monitoring plan that requires re-vegetation as necessary to compensate for any loss of vegetation or impairment of function.
3. Construction shall not be commenced until all relevant appeal periods have run.
4. The applicant shall notify the Department when construction is complete so that a final inspection may be performed.
5. Development under this permit shall commence within two years of the date of permit approval and shall be substantially complete within five years thereof or the permit shall become null and void.

6. Failure to comply with any terms or conditions of this permit may result in its revocation.

7. All bulkheads shall conform to the design requirements of the Washington Department of Fish and Wildlife, except where such design would be incompatible with protection of the shore process corridor and operating systems.

Dated this 25th day of March 2014.

Phil A. Olbrechts

County of San Juan Hearing Examiner

Effective Date, Appeal Right, and Valuation Notices

Hearing examiner decisions become effective when mailed or such later date in accordance with the laws and ordinance requirements governing the matter under consideration. SJCC 2.22.170. Before becoming effective, shoreline permits may be subject to review and approval by the Washington Department of Ecology pursuant to RCW 90.58.140, WAC 173-27-130, and SJCC 18.80.110.

This land use decision is final and in accordance with Section 3.70 of the San Juan County Charter. Such decisions are not subject to administrative appeal to the San Juan County Council. See also, SJCC 2.22.100.

Depending on the subject matter, this decision may be appealable to the San Juan County Superior Court or to the Washington State Shorelines Hearings Board. State law provides short deadlines and strict procedures for appeals, and failure to timely comply with filing and service requirement may result in dismissal of the appeal. See RCW 36.70C and RCW 90.58. Persons seeking to file an appeal are encouraged to promptly review appeal deadlines and procedural requirements and consult with a private attorney.

Affected property owners may request a change in valuation for property tax purposes notwithstanding any program of revaluation.

RIGHT OF RECONSIDERATION

Parties to this hearing have a right to request reconsideration as outlined in SJCC 2.22.210(O).

Exhibit A

Laufer Hearing Summary: PAPL-13-0001; PSJ000-14-0001

Note: *This hearing summary is provided as a courtesy to those who would benefit from a general overview of the public testimony of the hearing referenced above. The summary is not required or necessary to the decision issued by the Hearing Examiner. No assurances are made as to completeness or accuracy. Nothing in this summary should be construed as a finding or legal conclusion made by the Examiner or an indication of what the Examiner found significant to his decision.*

November 13, 2013 Exemption Hearing

Mr. Loring stated that this appeal is important because if this bulkhead is constructed along with an adjacent bulkhead that has been approved at the county level and is on appeal, it would fully sever the beach in front of that bulkhead from the bank behind it; in other words, it would completely cut off the source of the sediment for that beach. The witnesses for the appellant will talk about the importance of the coastal geological processes that occur for pocket beaches and for feeder bluffs; they will discuss how important pocket beaches, especially along this beach, are for juvenile salmon, threated under the Endangered Species Act, and they will discuss how the bulkhead would have a negative impact such as by causing de-vegetation.

Ms. Loring stated that Friends would give evidence that an exemption is an inappropriate process for this approval. It is inappropriate (1) because the bulkhead itself would not be constructed solely for the protection of a single-family residence and (2) because the second tier is not part of a bulkhead under San Juan County's code; the definition of a bulkhead requires a rock structure or other structure interacts with wave or wind energy. This proposed tier would not interact with the wave or wind energy. In addition, this project is more closely intertwined than previously understood with the parcel to the north and a project for a bulkhead there. That project requires a shoreline permit, so this project should have its impact analysed as well, especially because if both projects are approved, they will, as previously stated, cut off the breach from the bank, which has a serious impact. Evidence will be shown that this proposal is inconsistent with the county shoreline mast programs for ecological protections and for aesthetic protections. Also, evidence will be shown that this project did not follow the critical area ordinances mitigation sequence.

Mr. Loring stated that Friends wants the Hearing Examiner reverse the exemption for approval and require a shoreline substantial development permit. In lieu of that, Friends also wants to prove that this proposal does not merit approval under the shoreline substantial development permit either, thus Friends wants the proposal to be denied altogether.

Ms. Stephanie O'Day asked the Hearing Examiner to contain the evidence to site specific evidence that is affecting this particular property rather than getting into the worldwide consequences of bulkheading, which is entirely irrelevant to this site specific project and the issue at hand, which is whether or not this bulkhead complies with the state regulations 173.27.040C for a normal protective bulkhead to protect a single-family residence.

Mr. Loring called Ms. Lee McEnery to the stand. Ms. McEnery stated her name, confirmed that she was sworn in, and stated that she was the staff planner from the Community Developmental Planning Department who has worked on this matter. She stated that that the county was requested to provide an exemption for a project that includes two distinctly separate stretches of rock bulkheading. She performed a site visit when she reviewed the application, and she took photographs of the site, which are seen in Exhibit 8. While looking at the photos in the A5 tab of Exhibit 8, she explained how one photograph on the Woodman property shows the bulkhead built on an adjacent property. Ms. O'Day objected that a foundation was not given for examining these photographs, and the Hearing Examiner asked Mr. Loring to give a foundation. Ms. McEnery stated that it was possible that she took this particular photograph, but she is not certain when it was taken. She does, however, know what the photograph shows, and she stated that the photograph looks towards the Laufer property. Mr. Loring asked her whether the first two photographs in the A5 tab of Exhibit 8 show areas of erosion along the bank, and Ms. O'Day objected that the witness does not have the expertise to answer that question.

The Hearing Examiner asked Mr. Loring to clarify how Ms. McEnery identifies erosion. Ms. McEnery stated that in her job she reviews applications for projects that require her to understand whether erosion is occurring. She has gained the knowledge necessary to identify evidence of erosion at a shoreline. She stated that the first page of photographs in A5 in Exhibit 8 show are taken from the upper reaches of the property and are covered in vegetation; there is no erosion visible there. In the second page of photographs, the photograph at the top shows that a cut bank is visible, but it is not clear that there is erosion. The photograph at the bottom shows that there is one visible patch of erosion.

Ms. McEnery stated that she initially approved the exemption, and Friends of the San Juan subsequently appealed that approval. She prepared a staff report after that appeal for today's hearing dated 10/28/13, which is Exhibit 6. In the staff report, she recommended that the approval of the exemption should be reversed because new information that was not presented with the application revealed other facts that changed the application's relationship with the regulations. The critical areas ordinance mitigation sequencing was absent from the application. One reason she recommended granting the appeal was that this project did not provide a habitat impact analysis. Also, she recommended granting the appeal because this project turned out to be part of a larger project. If this project were reviewed in conjunction with the adjacent project, that combined review would help to assess properly the impact of these projects. She did not discuss alternatives to bulkheading with the applicant before granting the approval.

Ms. O'Day cross-examined Ms. McEnery. Ms. McEenry stated that she has worked for the Community Developmental Planning Department since 1986, and she has been a planner since around 1990. She does not have an engineering degree, a geology degree, or a degree in marine habitat. She has a bachelor's of science in agriculture and a teaching certificate in science, thus it

is fair to say she does not have the credentials to be an expert. She has processed a lot of applications for shoreline exemptions over the years. Ms. O'Day asked Ms. McEenry what is traditionally required as far as habitat assessment when somebody applies for a shoreline exemption. Ms. McEenry stated that she was not certain because it is a complicated question since not all exemptions are for bulkheads and not all bulkhead locations have habitats.

Ms. O'Day asked whether a single-family residence was normally exempted from a shoreline permitting requirements under the code, and Ms. McEenry confirmed that this was normally the case. She stated that she does not process exemptions for single-family residences. She stated that the building permit is the process for applying for an exemption for the construction of a single-family, shoreline residence; the county does not require a separate application. She stated that she did not know whether habitat assessments have ever been required for single-family residences to be built. She has processed many exemptions for normal protective bulkheads to single-family residences in her career. Ms. O'Day asked whether she required a habitat assessment for any of them, and Ms. McEnery stated that she did not remember.

Ms. McEnery stated that the new critical area ordinance had not yet been adopted, is not yet active, and she knows nothing about it. Currently, the county operates under the existing 18.30.110 code. Ms. O'Day asked Ms. McEnery where in the code it says that a habitat assessment is required for a shoreline exemption for a normal protective bulkhead that is exempted under local regulations. Ms. McEnery stated that the protective standards in 18.30.160 have mitigation steps and an assessment is required to show that those steps have been addressed.

Ms. McEnery stated that she was the planner for multiple Woodman projects, including SSDP, thus was familiar with the property when she issued the exemption in August. She received the Earth Solution's Northwest Geological Report on 04/22/2013, which is Exhibit I in the Laufer Exhibit. When Ms. O'Day asked, Ms. McEnery stated that she had seen the 05/23/13 letter from Francine Shaw, the Land Use Planner for Laufer, which included a packet that contained the geological report, a detailed project description and analysis, a site plan, a vicinity plan, a comp plan map, the geotech report, a storm water plan, a critical area review, a staff e-mail confirming the exemption permitting process, and a check. She reviewed these application materials carefully when they were submitted to her. Ms. O'Day asked her why she recommended that her approval of the exemption be reversed based on receiving new information when all the information was, in fact, given to her before she approved the exemption in the first place.

On 04/23/13, Ms. McEnery wrote in an e-mail to Francine Shaw that said she could apply for an exemption, and this was in response to an e-mail with the geotech report that Francine Shaw sent her. She stated that before the appeal she was concerned about approving the exemption, but she never communicated to Ms. Shaw that she was concerned. On 06/26/13, she received a SEPA comment letter from Friends, but she did not withdraw the DNS. Ms. O'Day asked whether the same issues contained in the SEPA comment letter were contained in the appeal filed on 08/22/13. Ms. McEnery started that she does not remember. On 06/28/13, she requested a tree removal plan from Ms. Shaw for this project, which she received on 07/11/13. She had no objections to the storm water management plan that was submitted in February 2013. Also, she received a hydraulic project approval from the Department of Fisheries on 07/31/13 prior to when she issued the exemption, but she did not review the HPA.

Ms. O'Day asked Ms. McEnery whether she recalled when Ms. O'Day called her the day she issued the staff report in which Ms. O'Day told her that the Coast and Harbor Additional Information Engineering Report was going to be transmitted to you that day, and Ms. McEnery confirmed that she told Ms O'Day over the phone that that staff report had already gone out in the mail. She stated that she understood the Coast and Harbor Additional Information Engineering Report. Ms. O'Day asked Ms. McEnery whether she recalled the report discussing how the rockery upper and lower tiers were engineered to require one another, and Ms. McEnery says she does not recall reading that specifically but that does not mean she did not read it.

Ms. O'Day asked Ms. McEnery what new information she received after 08/01/2013 besides the Coast and Harbor Additional Information Engineering Report that made her change her mind on this exemption. Ms. McEnery stated that there were questions about: (1) whether the upper tier addressed erosion, (2) whether it should be considered a bulkhead because it better fits the definition of a retaining wall, which is not an exempt structure thus would have been subject to the approval of a shoreline substantial development permit, (3) the fact that the 18.30 would have required a process to discuss impact minimization, (4) the fact that the comprehensive plan and case law supports analysis of cumulative impacts that had not occurred, (4) the fact that the drawings in the application did not actually show how the upper tier of rockery would intersect with the stairs and the degree to which the stairs would be altered by that, and there were no finished grades of the bank shown in the after state of construction, and (5) the fact that the re-vegetation plan does not appear to plant species that are already on the site nor show the clearing extent on the bank. More reasons for her changed recommendation are in the staff report.

Ms. O'Day asked where this new information came from. Ms. McEnery stated that upon further examination of the application, information was found to be lacking, and that is what is meant when she says she changed her recommendation based on "new information." Ms. O'Day questioned why Ms. McEnery did find information to be lacking after she read the 06/26/13 letter from Friends, which contained the same comments as the request for an appeal, and Ms. McEnery protested that this was not the case.

Ms. O'Day asked Ms. McEnery why she did not place any additional conditions on the Laufer exemption when she issued it on 08/01/13. Ms. McEnery stated that at the time, given the information she had, she thought she had enough to approve it as proposed. Ms. O'Day asked Ms. McEnery whether she had reason to believe that the single-family residence is not being threatened by erosion, which would explain why she changed her mind about issuing an exemption and recommended that an exemption should not be granted. Ms. McEnery stated that she was not the expert on erosion, and it was not her job to determine whether the residence is threatened by erosion. Ms. O'Day stated that currently the code is very sparse; it does not say that you need a written habitat assessment. It does require mitigation sequencing, but the conditions in the HPA as well as the conditions in the storm water plan, the conditions in the tree removal plan, and all the conditions contained in all the submittals are mitigating measures for this project. She asked how you could avoid building an exempt bulkhead if the reason for the exempt bulkhead is to protect the single-family residency. Ms. McEnery said she did not know.

In redirect, Mr. Loring asked Ms. McEnery what the HPA proposes for mitigation. She stated that she did not know what the HPA addresses. Mr. Loring asked Ms. McEnery to look at what is said in 8.30.110 and in 18.30.160 about protection standards that apply to critical areas. The code says that for projects within three hundred feet of an identified surf smelt spawning area, the county is able to require a habitat management plan to address the impacts.

Ms. O'Day followed up. She asked Ms. McEnery to confirm that she had indicated that when she issued the exemption on 08/01/13, she might not have had the HPA but is not certain. Ms. McEnery stated that this was correct, and she confirmed that she did have the HPA before she wrote the staff report on 10/28/13.

Mr. Loring called Mr. Jim Johannessen to the stand. Mr. Johannessen stated that he runs a business called Coastal Geological Services and has for over twenty years. He is the principal scientist, owns the business, supervises staff, leads project, etc. The business provides consulting to federal, state, local governments, tribes, homeowner associations, commercial landowners, and landowners with shoreline property. He has a bachelor's of science in geology with a minor in oceanography as well as a master's of science in geology with a focus on coastal geology. His focus in coastal geology gave him background in geomorphology as well as in coastal geology, and took planning/policy classes as well. His master's thesis was mapping coastal sediment transport cells along the beach, and the majority of that study area was in San Juan County. He has been to dozens of professional conferences, is a member of multiple professional organizations, and is a licensed geologist as well as a licensed engineering geologist. He stated that he has probably worked on over 1,000 projects that focus on shoreline processes/coastal geology in the Puget Sound area. These projects include things like single-family residences that are worried about erosion, homeowners associations with similar issues as well as surrounding boat ramps, roads, drainage, etc., assessments for mapping projects like for feeder bluffs, park rehabilitation and restoration assessments and deigns, and updating shoreline master programs.

Mr. Johannessen stated that his projects have helped him to understand both larger coastal processes and site-specific impacts and the relationship between those. He has worked on shoreline modification projects in San Juan County, including projects in which he had to consider the need for structures like bulkheads, projects in which he evaluated existing bulkhead like structures, and projects in which he provided recommendations on redesign and/or modification of bulkheads. Mr. Loring moved to qualify Mr. Johannessen as an expert in matters pertaining to coastal geography, and the Hearing Examiner agreed.

Mr. Johannessen stated that he was familiar with the bulkhead proposal that is the focus of the appeal. He has reviewed the reports from experts, has seen easier designs, earlier survey drawings, the new design, newer drawings, has reviewed agency comments, has read most documents in the file, and was able to go to the site briefly today, which was useful. The site visit was only about ten minutes. Mr. Johannessen has reviewed photos of the area, including those on the record as well as a few others, and he is familiar with this area. When Mr. Loring asked, Mr. Johannessen stated that the proposed bulkhead does not appear to be designed to protect the house; it is to the side of the house rather than below it and is a little distant.

Mr. Johannessen stated that the retaining wall did not appear to be designed to protect erosion from threatening the house, and it would not prevent it. The proposed retaining wall will not stop wave erosion; it has no contact with the waves. The geologist reports, the engineer reports, and the survey do not demonstrate where rock is or is not except for the exposed bedrock in front of the house; he does not have information on whether there is rock in the hillside between the rock outcrop at the toe and the house. Undoubtedly, there is, but it has not been determined.

Mr. Johannessen stated that are several ways to investigate the depth of the bedrock; you could do borings on the uplands until you hit bedrock with a drill rig, you could do ground penetrating radar, you could do more evasive methods but they would not be as efficient. Mr. Loring asked Mr. Johannessen to clarify where the survey from the application says the bulkhead is proposed to be on this property. Mr. Johannessen explained that the survey indicated that it was located at the toe of the bank. Mr. Johannessen stated that the survey seems to indicate that the bulkhead is not drawn into the bank but is in front of the toe of the bank, but a much more recent report from Coast and Harbor shows a bulkhead with cross-sections cut back into the toe of the bank. According to the Coast and Harbor report, the bulkhead would cut about five and a half feet into the bank. Excavating five and a half feet into the bank would at least in a temporary sense take the toe support away from the bank, over-steepen the bank, make it taller, and cause a loss of stability due to the replacement of native soil with a new structure. The native soil is glacial till, which is the most compact, dense glacial deposit in the region, thus it has a relatively high strength.

Mr. Johannessen stated that the Coast and Harbor report says that the proposed bulkhead along the shoreline stands at a steep angle and that would reflect wave energy more than rock that were tilted back further. The excavation of the retaining wall is at about eight to nine feet horizontally and one and a half foot in depth, and this, too, would have at least over the short term a destabilizing effect. If built well, the wall will eventually provide that support. But this retaining wall is not meant to address shoreline wave energy. Mr. Johannessen stated that he could not comment on whether if the bulkhead is excavated down and back into the bank from the toe of the bank, that would shift the ordinarily high watermark on this site.

Mr. Loring asked Mr. Johannessen to describe what is seen in a set of photographs from the Friends Exhibit that are marked as A5. Mr. Johannessen stated that the photographs are from the Woodman site to the north with the Laufer site in the background. Mr. Loring asked him whether he had calculated an erosion rate for the Laufer property, and Mr. Johannessen said that he reviewed the photos to try to form an opinion on a possible erosion rate. It would require repeated surveys and/or aerial photos over a period of decades to calculate erosion rate. Mr. Loring presented two blown-up photographs of photographs that are already in the record as well as two new photographs that show an aerial view of the property, and they were admitted as Exhibit 14. Mr. Johannessen confirmed that he gathered these photographs from the Department of Ecology website, and he stated that these photographs were one of the main sources he used to form his opinion on the erosion of the site.

Mr. Johannessen stated that his opinion on erosion at the side is that erosion appears very slow at this property; it is in the bottom of erosion rates in San Juan County. Looking at these photographs, the buff face appears to be well vegetated in 1997, 2002, 2006, and 2011 with the

exception of a very small area of the lower bank near the stairway in 2006, which looked similar to what was seen at the site visit. Every single tree in the photographs as well as at the site visit appears to be growing straight up. The photographs show a mature tree that has been dead for a very long time, perhaps a couple of decades, as seen via the rotting bark, the sizable woodpecker holes, etc., and the fact that this dead tree is standing leads Mr. Johannessen to believe that this is a fairly stable bank. There is a small area of localized erosion, but it does not seem to be a threat to development of the property. In general, everything is happening very slowly at this site.

Mr. Loring asked Mr. Johannessen how the erosion rate at this site compared to other erosion rates throughout the Puget Sound. He classified this erosion at this site as among the slower eroding bluffs composed of glacial materials that are exposed to marine waters. He is confident that the long-term erosion rate appears to be below one inch per year. Average rates are generally one, two, or three inches per year; the extreme in Puget Sound is about six inches per year. This property is tucked in a little ways thus not exposed from the directions that the dominant winter storms hit. There are several small shoals that would diminish wave energy from the west or from the southwest.

Mr. Loring moved to admit as Exhibit 15 a document from NOAA that shows shoals at the site on a 1 to 25,000 scale, which is the most detailed chart that NOAA makes for a region. Mr. Johannessen explained how this document shows the buoys as well as the rocks that diminish wave energy from various directions. Mr. Loring asked Mr. Johannessen to look at Exhibit A28 in the Friends Exhibit, the Coastal Erosion Management Studies in Puget Sound from a series of consultants from 1994. The graphic in the middle shows how coastal erosion occurs over several decades, and landslides happen about once every forty/fifty years. Mr. Johannessen stated that the erosion rate at the site would increase to some extent with sea level rise, but that rate is not yet evident; it is probably not very much, however. In his opinion, an upper retaining wall is not necessary to prevent erosion at this property.

Mr. Loring asked Mr. Johannessen to look at Exhibit B in the Laufer notebook, a report on a beach comparison visit. Mr. Johannessen was familiar with the document. He stated that he had prepared beach comparison reports in the past. He described how this report showed the toe of the bank in 2009 and in 2013. Usually, the beach comparison reports that he prepared tried to show a longer time period. Mr. Johannessen stated that the transects on this graphic were not placed at regular intervals; the labelling is inconsistent, and the graphic seems to show that the bank is growing into the water. The most important thing to measure shoreline movement is to get as a long a timeframe as possible; measuring at the same time every year is not as important.

Mr. Johannessen stated that this property does not need a bulkhead. There is not a threat to the house, considering the bank seems to be stable. If the applicant had approached him, he would have recommended that he did not see the need for an expensive, intrusive structure. There are many impacts associated with the construction of bulkheads; in general, there are site specific as well as off-site impacts. There would be a temporary disturbance in the soil, there would be a decrease of sediment supply to the beach, which means a substantial change, and vegetation would be lost some on the lower but more on the upper bank, which would impact fish habitat as well as bugs in the area.

Mr. Loring asked Mr. Johannessen to look at A32 in the Friends exhibit notebook. He was familiar with this document, an excerpt on shoreline armoring from a larger document, a Strategic Needs Assessment from 2011. The impacts that Mr. Johannessen discussed earlier are seen in this document as well. Shorelines are not static places, but a bulkhead replaces a dynamically adjusting system with a hard structure. The proposed bulkhead would have the impacts that Mr. Johannessen identified; some would be immediate, others would take a few decades. He disagrees with the claim from the applicant that the bank is not providing material for the beach. This claim is illogical, failing to follow the common understanding of geology or of shoreline processes in Puget Sound. Sediments could be deposited on the beach from the water column, but that is highly unlikely in this case; there is not enough energy in the tidal currents in this area. The material in the pocket beach is coming from the slow erosion of the bank behind as well as from the slow erosion of bedrock on site.

Mr. Loring asked Mr. Johannessen to look at Exhibit K in the Laufer exhibit notebook. He was familiar with this document, the Coast and Harbor paper. Mr. Johannessen said that many of the conclusions of this paper stem from the letter from the Earth System as well as the letter from the island geologist, and the flaws from those studies are brought into this paper. Those studies say that this is an eroding site, and the bulkhead structures need to be built, but Mr. Johannessen does not agree with those conclusions. The paper compares beach sediment in front of the bulkhead with beach sediment not in front of the bulkhead to draw the conclusion that there is no difference thus the bulkhead causes no impact, and that is a stretch.

Mr. Johannessen disagreed as well with the conclusions drawn in Exhibit R in the Laufer Exhibit. Exhibit R says that a change in the width of the drift log accumulation at the back of the beach would indicate a change in the volume of the sediment in the beach profile, and Mr. Johannessen said that the width of the drift log varies over time and is dependent on how much wood is coming from beaches outside the bay, currents, winds, and recent tidal elevations, thus a beach could change not at all on profile yet change dramatically with respect to the drift log line. The better way to determine a beach profile would be to measure the profile through surveying.

Looking at page 10 of Exhibit K in the Laufer Exhibit, Mr. Johannessen stated that this alternatives analysis had multiple flaws. It is built on the assumption that the toe of the bank needs to be protected, and the criteria that follow are the right criteria to consider in this case, but they are not satisfied with the conclusion that the rockery is the best alternative. The bulkhead does not meet criterion four, five, or six. The text in this document does not fully explain the table in the document. The analysis does not consider a no-action alternative.

Mr. Loring asked Mr. Johannessen to look at Exhibit A23 in the Friends Exhibit. Mr. Johannessen was familiar with the document, Protecting Near Shore Habitat and Functions in Puget Sound. It includes a more thorough list of impacts than what was seen in Table 1 in Exhibit K of the Laufer Exhibit. Mr. Johannessen said that some of the impacts listed in the document apply to the proposed bulkhead even though Table 1 from Coast and Harbor says they do not. The proposed bulkhead would impact forage fish habitat over time. In summary, he said that he would expect the proposed bulkhead to have the short-term, the long-term, and the cumulative impacts that Exhibit A23 identifies.

Mr. Johannessen stated that sea level is rising in San Juan County and is likely to occur at the site of the proposed bulkhead. Mr. Loring asked Mr. Johannessen to look at Exhibit A18 in the Friends Exhibit, which identifies sea level rise for Friday Harbour since 1934. Mr. Johannessen was familiar with the document, and he confirmed that the chart demonstrated about one to two millimetres per year sea level rise for Friday Harbour. Sea level rise would exacerbate impacts of the bulkhead that were identified earlier.

Mr. Johannessen stated there was an approval for the further continuation of the Woodman bulkhead, which would connect with the proposed in such a way that would separate the pocket beach from the bank behind it, which would eliminate or at least minimize sediment input.

Ms. O'Day started to cross-examine Mr. Johannessen with questions about what he said on his deposition. Ms. O'Day asked Mr. Johannessen what percentage of his work had been for the Friends of the San Juan in the last year. He stated that he was not certain, and he had not reviewed his deposition, thus could not recall what his answer was when asked the same question in his deposition. Mr. O'Day reminded him that his answer was 45%. Ms. O'Day asked Mr. Johannessen whether he considered himself a champion of coastal restoration in the San Juan, and he stated that he would not use that term, but Ms. O'Day said that he had agreed to the term in his deposition.

Ms. O'Day asked Mr. Johannessen whether he had represented any landowners in San Juan County in the last five years who wanted to build a rockery on their property. He stated that he had worked for property owners in San Juan County who have wanted to construct shore protection, and he had refused a number of landowners, including those who wanted to build bulkheads as well as those who had other projects, and this was simply because he was too busy to do take every job that he was offered. In the last five years, the one project in which he actually built a rockery was a restoration process for Mr. Crowley on Blakely Island; it was actually removing a rockery to replace it with a smaller one. When Ms. O'Day asked, Mr. Johannessen said he had only worked for a few private landowners in recent years.

Ms. O'Day asked Mr. Johannessen whether he subscribed to the precautionary principle, and he stated that in general he tried to follow the principle but he does not subscribe the principle dogmatically as a rule. When Ms. O'Day asked, he confirmed that he testified earlier that the impact of a proposal is site specific and that the impact a bulkhead has is specific to the bulkhead itself. She asked how using a study from Wales about a bulkhead that is completely different from the bulkhead proposed in this case is helpful in determining the impact of the bulkhead in this case, and he stated they are not able to wait thirty years to see what the impact will be in this case, thus they have to rely on examples from elsewhere like the study in Wales. They look at many studies because it is difficult to generalize one finding from one site to another. It is necessary because they do not have much data on this site.

Mr. Johannessen stated that this site is not a high-energy beach like Ms. O'Day suggested. He confirmed that he stated in the deposition that soft-shore protection is not suitable for all sites, and he said that soft-shore protection is probably not suitable for the Laufer site because it would require more maintenance than people would want to apply over time. He would not consider the Laufer site a large project. He confirmed his statement from the deposition that his opinion that

the proposed structure would have negative impacts is based on best available science as well as past experience, and he said the site visit confirmed his assessment. Ms. O'Day asked him to confirm that he had not visit the site himself before he made his opinion, and he said that was correct but that he had worked extensively in the San Juan area. Ms. O'Day asked him to confirm his testimony in the deposition that sea level was generally predicted to be up to forty inches by 2100, and he stated that he was not an expert on the topic; instead, the prediction is based on best available science. She asked him whether he was familiar with the Army Corps of Engineers report that states that the estimated sea level rise in the San Juan area is only going to be four to four point five inches by 2100. He stated that he heard of the report but was not familiar with it. He said that it makes sense that the relative sea level rise in San Juan would be lower than the sea level rise in Seattle.

Mr. Paul Levinson was an expert witness for the applicant, but he testified next since he was unavailable to testify the following week. He confirmed that his CV is Exhibit V in the Laufer Exhibit. He started that he has a bachelor's in civil engineering and has taken master's courses in civil engineering. He has nearly fifty years experience, had been in the Puget Sound area since 1974, and has been living in the San Juan Island since 1988. He has been responsible for fifteen to sixteen thousand projects during his time as a geotechnical engineer, and about four to five thousand of those have involved rockeries while about one thousand have involved landslides. He is associated with Earth Solutions, a company in the Seattle area. His speciality is soil and foundation engineering, which is normally called geotechnical engineering, but he is also familiar with environmental engineering. He has done several projects that involve shorelines.

Mr. Levinson stated that he recommended a tiered rockery for the Laufer project rather than a simple, straight concrete wall for stabilization because a tiered rockery has a smaller impact on the slopes as well as on the aesthetics of the site. He said that he has experience with this beach and has been there a lot in the last several years to work on the Woodman projects. When Woodman applied for his last bulkhead extension, Mr. Levinson did not know about the Laufer project. The first Woodman project was a shoreline exemption to protect the house, and the county granted that while under the same codes that are currently in place. The exemption for the first Woodman project was based on much less than the reports that have been presented for the Laufer project, and Mr. Levinson said that the Laufer project is really not a very large project; the number of reports as well as the detail of them is not really warranted in his opinion for this project. His report is Exhibit I in the Laufer Exhibit and is dated 04/19/13.

Mr. Levinson stated that his report was typical, and he took the photos that are included in the report. Ms. O'Day asked him to describe his findings from the Laufer site. He stated that landslides do not normally happen with glacial till because it is generally a very strong, stable material, but other factors can possibly lead to a slide in glacial till. For example, there can be an inherent structural weakness in the till itself such as from an earthquake. Erosion is a slow process that takes place over time; a landslide is a catastrophic event that happens quickly in a short time.

Ms. O'Day offered a colored diagram to be admitted as Exhibit 16, although the exhibit without the coloring is already in the record.

Mr. Levinson stated that the red on the colored diagram represented a scarp of a slide, one which was particularly steep, which means that it is unstable, and eventually will work its way up the bank, thus there is an immediate problem on this property: they need to stabilize the bank. The best way to stabilize the whole slope is to put the rockery at the bottom tier as well as at the top tier. Ms. O'Day submitted to the record the picture of the stairs at the Laufer property that Mr. Levinson took a few days previously, and it was admitted as Exhibit 18. Mr. Levinson described how the picture shows the bend in the wood of the stairs from the slope. Mr. Levinson repeated that as soon as he saw the site, he knew what the problem was. He stated that they have to stabilize the steep, unstable bank below the house, because it was going to work its way up eventually, and a tiered rockery is necessary to stabilize the bank. On page 3 in his report, Mr. Levinson listed six reasons why the rockery ought to be installed, and he stated that he stands by those reasons.

Even if the Woodman project was not going to be built, Mr. Levinson would still propose the Laufer project to stabilize the slope. But in that they stabilize the entire slope, the two projects work together. He stated that wave energy is one major cause of the landslides.

Mr. Loring asked Mr. Levinson to clarify what he said on page 4 in his report about how there was no evidence of fish spawning activates on the beach. Mr. Levinson stated that he did not perform a fish spawning survey, but he did examine debris along the beach for eggs, and he did not see any. He has not been trained in any way to spot spawning eggs. Mr. Loring asked for clarification on what Mr. Levinson said on page 2 in his report about how groundwater conditions are a factor that impacts the stability of the slope, and Mr. Levinson stated that, yes, groundwater conditions are one possible factor. The factors he lists in the report are possible, potential factors for the landslides that have happened on the site previously; you cannot always identify for certain the factors that caused a landslide when you look at the area after the fact.

Mr. Loring asked Mr. Levinson about the fact that the report called for vegetation to be cleared from the portion of the slope where construction will take place, and Mr. Levinson stated that the clearance was necessary. Mr. Levinson stated that his site diagrams do not show the elevations of the proposed bulkhead because you do not always know how to build a bulkhead until you start on the work. Building a rockery is an art, and it is difficult to see the slope when vegetation is not cleared. Mr. Loring asked Mr. Levinson whether he believed that armoring impacted natural process along shorelines, and Mr. Levinson stated that it impacted them minimally. When Mr. Loring asked, Mr. Levinson confirmed that he had worked on about four to five thousand rockeries. He stated that he very rarely recommended against building a rockery, because people do not call him for a recommendation when there is not a problem. He does not always feel that a rockery needs to be built when there is erosion on a beach, but he does believe that a rockery is necessary when landslides occur on a beach. He stated that there seems to be a geological anomaly in the till on the Laufer property that caused it to slide. Runoff will not normally cause a slide in till, because normally the till is so hard that the runoff runs over it, but that does not seem to be the case in this situation.

Mr. Loring asked Mr. Levinson whether the fact that you do not always know how to build a bulkhead until you start on the work means that you do not necessarily know what might be found in the toe of the bank until construction begins, and Mr. Levinson stated that this was

correct. Mr. Levinson confirmed that he did not take measurements at the beach on his site visit with the county to the Woodman property. When Mr. Loring asked, Mr. Levinson explained that his report does not evaluate sea level rise because he does not believe that it will happen to the extent that people think it will happen. Studies show that it is not happening at the degree that people fear that it is happening, thus Mr. Levinson does not look it at is a problem. He does not agree with Mr. Johannessen's testimony that the rate of sea level rise is increasing. He said that if there were a large earthquake, the tectonic plates may settle back to where they had been like Mr. Johannessen suggests. But he does not think that an earthquake is likely to happen; as far as he is concerned, it is about a 1 in 5,000 chance. He stated that he was not familiar with the National Research Council sea level rise document that the Friends put in the record.

The Hearing Examiner asked Mr. Levinson to clarify how wave energy would cause a landslide. Mr. Levinson stated that wave energy causes erosion, which undermines a slope, and the instability that results causes a landslide, which is the concern.

Cross Examination of Mr. Johannessen (By Ms. O'Day)

Under cross-examination, Mr. Johannessen noted that the Laufer site is strewn with drift logs. The Laufer beach is moderate energy while the Woodman beach is a litter higher energy. He does not recall his testimony from his deposition regarding the Woodman beach. By some definitions, the Woodman is a high energy beach. The Laufer beach is not in a drift zone or a mapped feeder bluff, but it is in a pocket beach. The subject property is in a pocket beach. There is evidence of old landslide scarps, such as is present in all of the bluffs in the county. No recent ones, however. He noted that this is based on reviewing aerial photos, ground photos, and his visit to the site. He has not studied the scarps on the Laufer property in depth. He is unable to give an exact age for the scarps, but he can estimate based on his 30 years of experience. Scarps are a feature of the landscape. They are not a type of landslide, erosion, or bank failure. There was a combination of the elements that contributed to the scarfs on the Laufer property. There is some erosion of the glacial till at the Laufer site, and a limited amount of this erosion directly feeds the beach. The Laufer beach is a moderate energy site with exposure to moderate winds. He has studied the beaches in the area for thirty years, but he has not studied the specific wind velocities for the Laufer site because this information does not exist. Mr. Johannessen is acquainted with David Simpson and Vladamir Shepsis consultants for coastal harbor engineering. He agreed that both are skilled coastal engineers, but added that does not mean he agrees with all of their findings. The data from the 1994 study "Shoreline armoring effects on physical coastal processes in Puget Sound" (exhibit A-28) is one of the best data sets, but probably not the best for bulkheads in Puget Sound. Mr. Johannessen agreed that David Simpson was one of the authors of the 1994 study. Mr. Johannessen believes erosion on the bluff is not happening at an alarming rate, the bluff is composed of glacial till, and glacial till is very packed due to it being covered for centuries by glaciers. The soil on the site is not 100 percent stable, but it should not be classified as unstable. The erosion on the site is partially caused by the wave attack, but it is very slow in nature. The wave attack is the type experienced during storm surges. There is no direct wave exposure from the south. He believes that the rockery would have a negative impact on the coastal processes. In regard to the Woodman property, the rockery has blocked a bluff from contributing sediment to the beach because it is the only known sediment source on that

beach. He believes that the Laufer bluff feeds that beach and that glacial till is the primary source of sediment on Laufer beach.

In regard to evidence that stabilizing the bank would cut off the majority supply of sand and gravel to the beach, Mr. Johannessen noted that there is gravel and sand in the glacial till; every sand size, clay, sand, silt, boulders. Also, there are angular and rounded pebbles in the glacial till with every sort of rock type; therefore, the till contains all grains sizes and almost all rock types found in this area and these are deposited onto the beach. In sum, bluffs feed beaches- in the Laufer beach and others like it. If the rockery is continued on the Laufer property, it will cause the slow erosion to stop and will result in 100% bulk heading of the pocket beach. The longer term effect of that is the "new-jerseyvication" of the shore. The structures, one by one, degrade the area of the beach, and they take away sediment. Mr. Johannessen would not expect a core sample taken at a site this small. Mr. Johannessen did not base his opinion merely on general knowledge. The ordinary high water mark in this area is about 9.1 feet in this area, approximately. He is aware that the project will be below 10 feet at beach level, and then extending back and down. At the beach, it would be below 10 feet, based on looking at the coast and harbor plan. He has not reviewed the HPA or the stormwater pollution protection plan for the project. He has reviewed the landscaping plan for the bank. He is not familiar with the mitigation measures outlined in these documents. The local expected sea-level rise in San Juan County will be lower than that in Puget Sound due to the gradual rise of the tectonic plates. He has seen Washington Administrative Code as it relates to shoreline exemptions and is aware that there is an exemption process for a normal protective bulkhead. He is not aware activity at the state level that would remove this exemption process. He is somewhat familiar with the changes in the code as they relate to bulkheads in San Juan County. He is not familiar with the changes that are proposed to take place relating to the CAO for San Juan. In most counties, CAOs only allow bulkheads to protect single family residences so a change to this policy would make sense.

Questions for Mr. Johannessen from the Examiner

Under questioning by the Hearing Examiner, Mr. Johannessen stated that he cannot speak on the position of Friends, but only as to his professional opinion of the site. The structures can and do cause negative impact to beach systems. The use of these structures should be limited to where they are truly required. In this case, there are mature and dead fir trees. The erosion rate is very slow, and there is no need for a structure. When a structure goes in, all the neighbors want structures. The structures become weak, and people put more and more in, and it's a one way road to more and more impact. This is the only sediment source for the beach and changing the system is not warranted. The wood that falls of the bank is very slow.

In regard to the Friday Harbor Wind Impact studies, the studies help Mr. Johannessen understand the site because Friday harbor is the longest wind record available and it is nearby. It is better to have a long record near the site, then a short one right at the site. Friday harbor is reasonable and not the greatest, nor longest record, but it is a good one. In the 1970s, experts relied on the Bellingham record because it was the longest at that time. The Friday Harbor record gives an indication of the magnitude of winds. Mr. Simpson looked at a wave buoy far to the southwest of the Laufer site (the New Dungeness Buoy) between San Juan Island and Port Townsend, but this buoy was also not at the site and in the Strait of Juan de Fuca so the swells are different. Friday

Harbor airport is known for westerly winds. Friday Harbor is not a perfect match compared to the Laufer sites as the winds do vary around the region, but it's a good measure. For this project, the wind is based more on direct site observations, reviewing the toe of the bank and other factors, than the Friday harbor wind impact studies.

Re-Direct Examination of Mr. Johannessen (By Mr. Loring)

In regard to the age of the scarps, Mr. Johannessen said he can only identify the exact age of the scarps is if they are very recent. There has not been a recent landslide scarp here, so the exact age cannot be determined. There are trees growing in areas where there would have been historic scarps. He estimates that the most recent date of any sort of scarping on the site is over 30 years, possibly over 40 years. There might have been more recent toe erosion, but that would not be a scarp. If this area was not bulkheaded there would be a good amount of erosion. Construction of a bulkhead would throw off the good amount of erosion, changing the equilibrium. In Washington State, ordinary high water mark is not a fixed elevation, it is determined by factors such as a change in the character of the sediment and vegetation. In this case, the line is the toe of the bank. The bulkhead's location on the beach is more important than a tidal elevation for determining impact. He did not did not rely on wind characteristics for the primary points in his testimony, but he does not believe there is a better wind record for this site then the Friday Harbor study. Slumping in glacial till is not common - slumping is wet, usually refers to mud slides. He did not observe extreme landsliding when he visited the Laufer property..

He was on the site 10-15 minutes and that is long enough for someone with his experience to assess landslide risk.

Re-Cross Examination of Mr. Johannessen (By Ms. O'Day)

In regard to his site visit to the Laufer property, he made his observations based on evidence of what high wind and high water would do to the land. There is a correlation between the Friday Harbor records in that, usually if there is wind on one part of the island, there is similar wind on another part. He believes pocket beaches will create a rockery snowballing effect. He is aware that the Laufer rockery ties into natural rock and the pocket beach ends because of the natural rock. If the Laufer bluff is armored, there will be nothing left to armor on this beach. There is no concrete proposed for the Laufer project at this time. If wind came from the southeast, there would be no direct impact on the Laufer property.

Re-Direct (again) Examination of Mr. Johannessen (By Mr. Loring)
Mr. Johannessen noted that the natural rock that protects the bank also protects the house.

Direct Examination of Ms. Tina Whitman (By Mr. Loring)
Ms. Whitman lives on Orcas Island and has worked at Friends of San Juan since early 2002. She is the Science Director. She works on restoration, protection and research programs, and this work focuses on shorelines. She has an undergraduate degree in environmental design with an emphasis on natural resources. Also, she has an interdisciplinary Masters in landscaping ecology,

conservation planning, and biology. Her masters thesis was about application of wildlife data to land use planning. She has training related to forage fish in the sea-both certified by the state, and work experience from her job. She noted that Dan Pentilla is someone who she has done some of her work with in the past few years. He is a forage fish expert. He was the forage fish expert at the Department of Fish and Wildlife. He spent 36 years at the Department, and authored many papers. He is retired now, but is an active consultant.

Ms. Whitman stated that she is currently working with Mr. Pentilla on the vertical elevation of spawn. They are trying to see vertically, across the beach, where the eggs are located. She has drafted reports and given presentations on foraging fish at numerous conferences, presenting specifically on foraging fish. She has created reports and presented at conferences on bulk-heading, but only in reference to forage fish. Additionally, she has been on multiple committees relating to science and wildlife and has many years experience in San Juan County. Ms. Whitman is qualified as an expert in nearshore ecology and natural processes

Ms. Whitman testified that there are roughly 408 miles of marine shoreline in San Juan County, and roughly 90 miles have suitable or potential surf smelt spawning beach. 10 miles have actual, documented surf smelt spawning, and, of the 10, between1.5 to 2 miles have been armored with bulkheading. This number comes from mapping the forage fish habitat and a boat-based project that mapped the armoring in San Juan County. The near-shore marine environment is the environment near the shore . It covers out to the depth where the light penetrates, and then inland to where upland processes are impacting the beach.. In the near-shore area, forage fish spawn, and there is a kelp habitat structure. Additionally, it is a migratory and nursery habitat for a high number of juvenile species including 69 different species of fish in San Juan County-which is high compared to other places. Beaches provide shade and insects for juvenile salmon. Large organic debris goes into the water and affects the habitat. Microclimate is a term explaining that the substrate on the beach has a different humidity and temperature. Ms. Whitman is familiar with the "Brennan" report and the Laufer property. She is able to locate the property on a map. She has studied the site photos from Department of Ecology, maps of various fish, about spawning, juvenile fish studies, data from sites, and some of the salmon work. Additionally, she attended a site visit. Exhibit A-5 is a picture of the Laufer property taken from a boat off-shore. A pending application in addition to the Laufer application would extend the existing two-tier bulkhead to the bedrock below the stairs shown in A-5. Based on this information, if the Laufer project is approved it would affect the ecological functions described earlier. The vegetation would be removed, which would affect shade, microclimate, large wood debris, and insects. Vegetation includes shrubs and trees.

Exhibit number A-20 is a summary by Ms. Megan Dethier, a nearshore ecologist at University of Washington. It is a summary for the San Juan Initiative policy group on impacts of shoreline modifications to shoreline habitats. Ms. Whitman agrees with the Dethier summary and believes the Laufer bulkhead would have the same impacts described in the report. In Ms. Whitman's opinion, bulkheads do not protect shoreline ecosystems. The diversity of trees is reduced and shrub layer is removed. The intent of bulkheads is to protect property and stop erosion behind them, but natural erosion is good, and part of the beach process. In regard to exhibit A-10, she said that the map is part of a larger study conduct that prioritizes shoreform habitat. This map shows that the area of the proposed bulkhead is one of the highest priority fish use shoreforms.

This conclusion is based on the combination of fish use and forage fish habitat factors. The proposed location for the bulkhead is in an area mapped as highest priority which means that the site is high priority for protection and/or restoration efforts. There was a survey of all the San Juan areas, where it was prioritized which areas needed restoration/protection the most. The area, where the bulkhead is proposed, was among the highest priority- top 3%. This is based on juvenile salmon use, as well as forage fish habitat and rearing. San Juan is the nursery ground for many salmon species. Pocket beaches are the shoreform most associated with juvenile salmon. The Laufer property is in a pocket beach.

In regard to exhibit A-11, Ms. Whitman noted that the map shows the near-shore fish resources including forage fish spawning areas. The Laufer property is highlighted on the map and the pink shows herring spawning grounds. There are photopoints marked from where each sample for the survey were taken. The map indicates there is surf smelt habitat along the entire shore of the Laufer beach, along with herring off-shore and eel grass. The yellow line on the map indicates the surf smelt breeding grounds. The Department of Fish and Wildlife says that breeding grounds spread 250ft in either direction from a positive survey site. Surf smelt spawn on mixed sand and gravel. Exhibit A-5 is the photo that was taken when the forage fish survey was taken. Exhibit A-6 is a photo taken just north of the site where a spawning site was also found. There are 59 known spawning sites in San Juan County.

In regard to exhibit A-15, Ms. Whitman said it is the final report of the beach study referenced above that was funded for salmon recovery. The report is the best information available on nearshore fish use. The study found that, while different types of beaches could be suitable for salmon, pocket beaches were the most likely to have salmon as well as other types of fish species. Smurf smelt and pacific herrings are also often found in pocket beaches. Eggs have been found at the ordinary high water mark before. Protection is the top mitigation strategy for San Juan County and restoration is the next option. When Ms. Whitman visited the site last week, it appeared to be a viable spawning site. She is familiar with the location on the beach that has been proposed for the bulkhead. Exhibit A-5 includes a photograph depicting the Woodman property bulkhead. The current proposal will place a bulkhead at the toe of the bank which, based on the existing bulkhead, would place it waterward of being built in the toe. There is a discrepancy in building the two bulkheads together in one system. The ordinary high water mark for the Laufer property is at the toe of the bank while the Woodman property is not. If the bulkhead were built below the ordinary high water mark, it would have an impact on surf smelt spawning habitat. Ordinary high water is not a fixed line. Additionally, shade and microclimate would still be affected if the project is below the ordinary high water mark.

In regard to exhibit A-36, Ms. Whitman stated that a biologist, Casey Rice, looked at a few of the potential impacts of armoring on beaches. He looked at microclimate and humidity, and survival of incubating smelt eggs in front of the structures. These were all negatively affected by armoring. This study applies to the proposed bulkhead as it was taken for Snohomish County and the structures were of equivalent height. It was one of the first cases where the biological impacts of a structure were found. In summary, the report found that beaches in armored shore had drier substrates with higher light-intensity. In Ms. Whitman's opinion, the proposed bulkhead would have similar affects. The proposed bulkhead would negatively impact organic litter and dead material coming from upland to the beach. Exhibit A-22, produced by the

University of Washington, looks at juvenile salmon diet. The findings are that juvenile salmon eat a variety of things, including terrestrial insects, which come from multiple sources, including leaf litter, logs, large wooded debris on the beach, and through river and wetland systems. In the nearshore here, most would come from riparian vegetation (shoreline vegetation) and wooded debris on the beach. If this bulkhead were built, it would reduce the riparian vegetation.
Exhibit A-40 is work from the University of Washington. It compares armored versus non-armored beaches and looks at micro-invertebrates that are in the beach substrate. The study concluded that there were changes in diversity of species found in front of armored beaches (lowered). There were a broader range, higher number of insect species on natural beaches.

Ms. Whitman stated that she is not aware of any evidence that bulkheads protect trees, but she knows they can be used to try and save trees. Most of the studies do not show that bulkheads protect trees. In fact, bulkheads hurt overhanging vegetation and riparian forest in general.
There are methods of saving trees that do not involve bulkheads such as leaving existing vegetation intact or creating a wider vegetation buffer. It would be very hard to make a bulkhead that would not harm smelts, herrings and salmon, especially at a known spawning site such as the proposed site. Ms. Whitman embarked on a 2 year conservation planning process with about 40 scientists. They identified the top threats to the marine ecosystem in the San Juan area. This was all put in a report that was later adopted by the San Juan County Council. Bulkheading was the #3 threat- or part of the #3 threat which was all shoreline modification (behind oil spills and climate change). In 2009, the Marine Resources Committee recommended that no good scientific evidence was available that mitigation was successful for marine habitats. No formal policy was set. There is no other committee focused on marine shorelines in San Juan. This project has received hydraulic project approval (HPA). However, in San Juan County, no project has ever been denied HPA. Exhibit A-34 is a study authored by Tim Quinn the head habitat researcher at the fish and wildlife department. This is their internal review of the HPA process. Concerning bulkheads, the internal review found that in terms of effectiveness, the HPA process was not adequately protecting habitats. So even if someone is granted an HPA, and does everything they are supposed to, the desired result of protecting the habitat was not being met. She is not aware of any changes to the HPA system since the report was conducted. The fact that the HPA is met for this proposed site does not mean there will be no damage to the relevant marine habitat. When granting an HPA, the Department of Fish and Wildlife focuses on construction issues, not on long term impacts.

Exhibit A-43 is a pilot study that shows that armoring negatively affected fish spawning. There was an updated study that is essentially the same. The study reviewed areas of direct burial, areas where armoring was lower than the known spawning zone, impacts to the coastal sediment supply, and impacts to sediment transport. The proposed bulkhead would have a negative cumulative impact on the pocket beach in which it would sit. It would be substantially disrupting riparian vegetation, the source of natural shading and the micro climate. These effects would be significant, and it would contribute to cumulative impacts county-wide. In San Juan, county residential development is the most common way that shorelines are developed.

Question by Examiner for Ms. Whitman
Ms. Whitman did not create map A-11, priority shore lines for this appeal proceeding. It is a map that is part of a project report that was done previously by herself and a team of researchers.

It was prepared in December, 2012. It was created before she heard anything about the exemption application.

Cross Examination of Ms. Whitman (by Ms. O'Day)

According to Ms. Whitman, exhibits A-37 and A-38 are Marine Resource Committee reports that were prepared while she was on the committee. She testified that shoreline modification, which includes armoring and bulkheads and boat ramps-and any sort of on-beach construction- is the third highest threat to marine life. Ms. Whitman had a deposition taken in September, 2014. In that deposition, she stated that any type of shoreline armoring was a threat to salmon. The level of threat to salmon depends on the type of armor, type of beach, the location of the structure, and many other factors. There is a greater risk if the armoring is below the ordinary high water marker. The MRC noted that mitigation for marine habitat is not successful. Ms. Whitman stated there is a correlation between the effects of armoring and salmon. In her opinion, all of San Juan County shoreline is a critical area because it is so vital for juvenile salmon. It would be nice if no shoreline modifications were allowed in any critical marine habitat, but it is impossible. The MRC report (exhibit 37) does not take the stance that any and all modification are bad and should not be allowed. In Ms. Whitman's opinion, there is nothing threatening the Laufer home, and protection of a home is not a public benefit; however, if necessary, moving the home is an option rather than building a bulkhead.

In regard to smelt, Ms. Whitman has never found any surf smelt eggs above 9.2'. She is unaware if the existing rockery on the Laufer beach has caused any increased erosion. In most spots, fish spawn year round in San Juan County, but she is not aware if they are spawning year-round in the Laufer pocket beach. Some surf smelt eggs can become unviable due to solar radiation and humidity. If the bulkhead were installed above 10', it would not affect their habitat, but the survey shows that it is planned to be built at an 8.9. The drift line on the property is not inhibiting surf smelt spawning, but the driftwood line is generally too high up - it's on the dry portions of the beach- where the fish do not go. The upper extremity of fish spawning is generally 8.5-9 feet. In the study she conducted with Mr. Penttilla (exhibit A-30), the majority of fish eggs were found at +7 and +8 feet, but higher locations, while less common locations still have spawning. Smurf smelt like finer grain sediment and not coarser gravel.

In regard to, Exhibit A-31, Ms. Whitman answered the following questions posed by Ms. O'Day:

At site #1, highest elevation tested was 8.5 feet. How many eggs were found at that height? -Zero
At site #2, highest elevation tested was 9.2 feet. How many eggs were found at that height? -Zero
At site #3, highest elevation tested was 9 feet. How many eggs were found at that height? -30% of the eggs from site #3 were found at about 9 feet. That was at Blind Bay.
At site #4, highest elevation was 8.8 feet. Eggs found? –Zero.
At site #5, 8.9 feet. Eggs found? -Zero
The highest elevations at sites #6, #7, and #8? -Zero eggs found
At site #9? Some eggs found at highest elevation.
At sites 10 and 11 No eggs found.

In regard to exhibit A-23, the exhibit provides guidance for planners, but it is not regulation. Ms. Whitman noted that the report says that adverse impacts are particularly evident in places where

construction occurs below the ordinary high water mark. The report goes on to suggest that if the there is no construction below the ordinary high water mark, alternative methods should be used to avoid future impacts of the approved permit if the design meets code regulations. The report also notes that greater impacts are found in feeder bluffs, and Ms. Whitman stated the Laufer beach is not a feeder bluff. Exhibit A-23 is for guidance only. Ms. Whitman understands that the rationale for the proposed bulkhead is to protect the Laufer residence. Exhibit A-43 was prepared with a grant from the bullet application. Ms. Whitman worked on a team that created the application for the grant. The grant application notes that permitting the building of additional bulkheads is not likely to provide a long term solution to erosion control and will only amplify habitat losses. Ms. Whitman agrees with this statement. Additionally, Ms. Whitman agrees with the Exhibits A-43 contention that the preferred spawning range of surf smelt is 7 to 9 feet, roughly above mean high water in San Juan.

In regard to exhibit 19, In regard to her expertise in sea-levels, Ms. Whitman reviews sea-level rise documents and reports for San Juan County. She does not create sea level rise estimates. Ms. Whitman has reviewed an email chain between Ms. O'Day and Mr. Michelson of the USACE regarding sea level rise (exhibit 19). She agrees with Mr. Michelson's estimate of 4 inches of sea level rise over next 100 years based on the current rate; however, most of the literature says that the rate will increase. The precautionary principal says that, in the absence of concrete information, once should act more conservatively, or in a more protective manner. Ms. Whitman prescribes to the principle, but the MRC does not prescribe to any specific position. In the past the MRC tried to hold to the precautionary principal, but she cannot speak to the current position of the MRC.

In regard to Exhibit A-20, Ms. Whitman stated that she is not sure of the exact date, but the study was conducted for the San Juan Initiative sometime between 2006 and 2008. Ms. Whitman was on the Science Advisory Committee to the Initiative Project. Ms. Whitman read from the report which stated that "unfortunately there is very little concrete data" establishing the connection between shoreline modifications and the health of the near shore environment.

In regard to site specific information on vegetation, the application materials talk about removing marine vegetation. Based on the proposal, Ms. Whitman cannot imagine that substantial amount of vegetation would not be removed. Based on the past six years, she does not believe that HPAs are full of conditions for protection of marine life. She is not aware of how many trees will be removed from the site because the number has changed many times.

Re-Direct of Ms. Whitman (By Mr. Loring)

In regard to the bulkhead location in the Woodman proposal, Ms. Whitman stated that she believes the structure was proposed to be a substantial number of feet above ordinary high water. The ordinary high water mark has been identified as the toe of the bank for the Laufer beach.. Bulkheads located below MHHW will have a worse direct impact on organisms living in the substrate. Armoring is not risk-free at any height. It is difficult to know how many trees would need to be removed before excavation begins. Shrubs and other vegetation are also important to the shoreline. The HPA, did not evaluate the indirect impacts. Shade on the beach is important for the surf smelt spawning habitat. The sea level is anticipated to rise in San Juan County, and

this rise will affect the location of the today's surf smelt spawning habitat. On natural beaches, the whole beaches will move landward. Smurf smelt are identified as at risk to sea level rise-especially if there is a shoreline modification on the relevant beach. Exhibit A-50 notes that the restoration goal for Puget Sound is that the amount of armory being removed should be greater than the amount added. Currently, this goal is not being achieved.

Re-Cross of Ms. Whitman (By Ms. O'Day)
Ms. Whitman testified that her goal is not to end all new armoring. She evaluates each case's impacts individually.

Direct Examination of Francine Shaw (By Ms. O'Day)
Ms. Shaw is a land-use planner with the law office of Stephanie O'Day. She has a Bachelor of Architecture from Washington State University and has worked as a land-use planner since 1991. She has worked in private and public sector, including 13 years as a public sector land planner. She also worked for San Juan County. She prepared the application materials for the Laufer rockery.

Ms. Shaw noted that Exhibit A is the cover letter for submittal of the Laufer shoreline exemption for the bulkhead, her regulatory analysis, and other documents that were part of the application. This application was submitted as an exemption because in Ms. Shaw's opinion, this bulkhead meets the San Juan County Code for an exemption. To her, the data showed that this bulkhead was needed to protect the family home. Ms. McEnery, the planner at that time, told her that she could apply for an exemption. She does not know whether Ms. McEnery visited the site before sending her an e-mail stating that she could apply for the exemption.

The photos contained in Exhibit I are accurate depictions of the Laufer property, although photo 14 is the woodman property. Prior to submitting the application, Ms. Shaw put together the following materials: a storm water plan, site visit, asked for a critical areas review from the county, did regulatory analysis for exempt bulkhead. The stormwater plan is attached as Exhibit M. In terms of mitigation measures, with a bulkhead, the primary concern is during construction. The mitigation measures are work corridors, silk fencing, and side stabilization methods after construction is done-like seeding and replanting. Ms. Shaw had processed shoreline exemptions in the past, including rockeries, buoys, shoreline repair, and rockery replacements. Jason Hencil at San Juan County reviews exemption applications. The stormwater management plan was approved. During the process, Ms. McEnery had no questions for Ms. Shaw about the stormwater plan. Ms. McEnery did ask for a SEPA checklist, and Ms. Shaw complied with her request by sending her a completed SEPA checklist that very day. Exhibit G is a copy of the checklist. Additionally, Mr. Bob Anderson with star surveying did a survey for this project. And Mr. Anderson has worked on this beach for many years, including the adjacent woodland rockery, which is part of the same pocket beach.

Ms. McEnery asked Ms. Shaw to identify which trees were to be removed. There are only two trees to be removed-that is what Ms. Shaw told Ms. McEnery, and that has not changed, to Ms. Shaw's knowledge. According to Exhibit A- Regulatory Analysis- page 3- shoreline exemption application, the proposed intent of this project is to protect an existing single family residence

and beach-access stairs. Ms. McEnery never questioned the submission of an exemption for this project.

For a project description and regulatory analysis of a bulkhead, Ms. Shaw relies heavily on engineers for size, location, purpose, etc. She relies completely on them for that information. Once she collects the relevant information, she fills out the regulatory analysis. The bulkhead is proposed to be constructed at the toe of the bank and that plan has not changed during the course of this application. No one from the county, including Ms. McEnery, ever questioned the tree removal plan or stormwater pollution prevention plan. The critical areas ordinance has been in place since 2002. Ms. Shaw has been working in the area since 2003, and she has never had to submit a critical areas analysis for any shoreline exemptions. Exhibit N is the witnesses' cover letters for submittal of the JARPA application to the Department of Fish and Wildlife.

Ms. Shaw has submitted 48 HPAs for clients in a past. She cannot say whether exhibit N is typical of what is needed on shoreline projects, although she can say that for this particular proposal, it is sufficient. Biologists at fisheries do not just rubber stamp these; instead, they put thought into these applications. They have specific regulations for the bulkheads, they review the applications. In Ms. Shaw's experience, forage fish spawning beaches are being more heavily scrutinized now than in the past when one is seeking a permit or approval to build or modify something. She has worked on a project recently in which WDFW made it difficult to receive an HPA for a project. The process with the WDFW was so difficult, they decided to give up the project before the review phase. Exhibit O is the HPA that was issued on this project on July 31, 2013. It was issued by Laura Arbor, a biologist. The HPA was issued 1 day before the exemption, and it has provisions under bulkhead construction. It has lots of conditions and provisions for mitigating or protecting damage to the environment. It is heavily conditioned. To Ms. Shaw's knowledge, the applicant is willing to meet all of these conditions.

Exhibit U is the shoreline exemption approval. There are no conditions attached to it. In Ms. Shaw's experience shorelines exemptions usually do not have conditions, but the county has the authority to do so. The client, to her knowledge, would not object to any conditions that were added that would require the applicant to comply with the conditions of the HPA, the stormwater plan, and the tree removal plan.

Exhibit T is the Woodman landscape plan that Mr. Schramm prepared. The Laufers hired Mr. Schramm to do the landscape plan for their beach. Ms. Shaw has done site visits with Mr. Schramm and discussed this project many times with Mr. Schramm. The issue here on the Laufer property, is that there is not a lot of canopy that hangs over. It's more of a terrestrial riparian area, as opposed to a marine habitat. So it is planned to add trees- to enhance it over what is there now. Mr. Schramm was suggested by the San Juan Conservation District. He specializes in native plants along shorelines.

There is a new proposed critical areas ordinance that has not yet gone into effect. It is incredibly different from the current one. It will be very complicated ordinance to implement. The proposed new ordinance says that if you are near a critical area, there are a number of things you have to do, including things with drift zones, tree protection zones, and all sorts of things. It would make shoreline permitting much more complicated.

Cross Examination of Francine Shaw (By Mr. Loring)

Ms. Shaw stated that a geotech report by Earth Solutions stated that a bulkhead was necessary to protect the residence. She has received numerous reports from Earth Solutions Northwest that did not say a bulkhead was needed. The Laufer report was the first one she received that said a bulkhead was necessary for the stability of the home which is why she presented the project to San Juan to find out if the project was exempt. Ms. Shaw has worked with Mr. Levinson on 8-10 bulkhead projects, and this is the first project he has said requires a bulkhead to protect the home. The proposed bulkhead length is 30' at toe and 50-55' on the second tier based on the geotech report. If possible, the applicant will leave the roots of the trees that will be removed. The root systems will help further stabilize the slope. The preliminary survey does not show how the roots will be retained. She is unaware of what size standard was required for a tree to be considered a tree for the preliminary survey in Exhibit L. A tree removal plan was not required as part of the application and the County only has what trees needed to be removed. In regard to Exhibit O, the HPA expires on December 31, 2016. After that date, if the bulkhead is not complete, then it expires, and they have to start from scratch with a new application. However, the applicant can receive a 1-year extension for legitimate reasons. Even after the permit expires, there are on-going conditions that have to be followed. The HPA requires that graveling occur within 72 hours of bulkhead construction; however, it is unclear if this beach conditioning is an ongoing condition. The HPA requires an enhancement of the vegetation from the before-construction state. There will be more trees than before on site. The HPA does not require the same vegetation, but the applicant has hired a landscaper to find the best vegetation for the site. The landscape, Mr. Schramm, is a landscape architect that works on shorelines. The application proposes big leaf maples for the property. Exhibit A-5 does not depict any big-leaf maples, but these trees are indigenous plants that will enhance the existing conditions.

Ms. Shaw stated that the bulkhead will result in the removal of some vegetation, but it will be replanted. There will be temporary exposure, but within 3 years, the shoreline will look better. The landscape architect does not have biological expertise, but he is an expert on riparian habitat. He was recommended as the foremost landscape architect for shoreline landscaping by the San Juan Conservation District. The project name for Exhibit N is "Laufer Residential Protective Bulkhead." The Exhibit does not show the depth or height of the bulkhead. In regard to the landscape plan, the plan it to have a good habitat within 3 years of vegetation. In 3 years, the landscape will be more useful than it is today. Putting in big because they are less likely to survive. Therefore, the plant is to utilize smaller vegetation. The County can require an approved landscape plan as a condition of approval before the beginning of construction. The greatest benefit will be for the upper terrestrial area. Currently, there is not a lot of overhang, but in 3 years there will be an overhang that has never existed. Ms. Shaw has requested these improvements from the landscape planner. Maples are deciduous as they lose their leaves in the winter, but there are plenty of shrubs too- so there will be a mix of deciduous and evergreens. There are also scotch pines on the property. According to the landscape, the scotch pines are indigenous to San Juan.

Re-direct for Witness (By Ms. O'Day)

Ms. Shaw has done studies about shade and light at this site. The Department of Fisheries took pictures over the years of the existing bulkhead as photographic evidence. The photographic

evidence will continue to be taken for Woodman's new bulkhead. Vegetation will not just be at the new bulkhead, but at the existing bulkhead too because of prior comments made by FOSJ.

Direct of Mr. Anderson (By Ms. O'Day)
Robert Anderson is a professional land surveyor. Exhibit W is a copy of his CV. He was educated in surveying with an undergraduate degree and graduate studies. He has worked in surveying since 1970. He has been a professional land surveyor since 1981. He managed a survey division in a large corporation with up to 35 employees. He has worked for the UN, as well as Ethiopia, and has won an award for his work.

Mr. Anderson is familiar with the beach property owned by the Laufers, and the adjacent property owned by the Woodmans. He started working on this beach as early as the fall of 2007. He initially did work for Woodman; a boundary line modification which required him to map the shoreline. He also mapped to the Laufer stairway.

Mr. Anderson testified at the appeal of the Woodman bulkhead in 2009. He does not recall any issue about the ordinary high water mark at that time. He made the delineation of the OHWM. There are a couple of issues that come into play when delineating the OHWM. For instance, different agencies have different definitions of what it is and therefore where an OHWM is. Initially, it was defined as being the limits of upland vegetation.

Mr. Anderson prepared the underlying maps in Exhibits 16 and 17. Ms. O'Day did the coloring. Mr. Anderson noted the exposed rock area of the beach, the soil area, a stairway, a pathway at the top, and flat ground.

Every time Mr. Anderson has visited the Woodman-Laufer properties, there have been drift logs. The location changes depending on the season and storm conditions, but there are always drift logs. In most cases on the beach, the location of the drift logs are 7.5 to 8.5 feet- and a lot of that depends on the girth of the log. A larger log will not go as far up the beach.

Mr. Robert Anderson knows Mr. Paul Anderson from the department of ecology. He has evaluated OHWMs delineated by Mr. Robert Anderson. On many occasions, when Robert Anderson has delineated the OHWM, Paul Anderson has come out on behalf of the county and also evaluated it, and they have arbitrated, on site, a few times, where the OHWM is. They have agreed almost every time. They disagreed on it this time because it is an evolving science-Mr. Paul Anderson wanted it to be the toe of the bank, and Mr. Robert Anderson just said "okay." Mr. Robert Anderson agrees that Mr. Paul Anderson has a founded opinion in his assessment based on recent discussions at conferences and the Department of Ecology

Mr. Robert Anderson understands the proposal involves digging into the toe of the bank and not going any further out than the toe of the bank. It was clear from his conversation that they are going to build the bulkhead above the ordinary high water mark.

Mr. Anderson prepared Exhibit 17- the site plan, and also exhibit B-site plans. Looking at the second page of Exhibit B, Mr. Anderson pointed out the lower tier rocker ties into the native rock bulkhead. Because of this tying-in, there will be no need to further extend the bulkhead.

The elevation of the toe of the proposed rockery is approximately 10', but there have been some issues- so that is not exact. The zone a within a foot or half a foot of the toe of the bank.

Page 1 of Exhibit B is a map based on field data that shows variations in the beach over the relevant time. The beach is dynamic; therefore, it has moved. It has gone seaward and it has also gone upland. Mr. Anderson has been on that beach a number of times. He's probably been there 20 times over the years because of his work on the Woodman property and other reasons. Over the past couple of years, he has noted the sudden appearance of a large rock. He has also seen drift logs pushed high up on the beach. Because the beach is dynamic and changing, there is some confusion over where the OHWM is located. The bank has been moving waterward.

Exhibit C is a document that Mr. Anderson prepared. The exhibits purpose is to show the extent of the sunlight on the beach, which varies by the time of year, time of day, etc. The conclusion to draw regarding sunlight is that given the geography, on a yearly basis the beach will be exposed to the sun 50% of the day, year round. During the summertime, the beach will have longer and earlier exposure.

Cross-Examination of Mr. Anderson (By Mr.Loring)

Mr. Anderson stated that exhibit A-5 is a photograph of the existing bulkhead with logs at the toe. This is the bulkhead he referenced earlier in his testimony. There is water against the bulkhead at the bottom. It is not unusual to have water higher than the ordinary high water mark. Mr. Anderson is not aware what season the photograph was taken during. Knowing the depicted bulkhead, he estimated that tide is above 8 feet. He cannot say if this is common or not. The OHMW is a biological line that can vary. It does have a certain elevation attached to it and the mean high water mark is the elevation line. The ordinary high water mark is usually higher than the mean high water. Mr. Anderson does not know if the bulkhead could change in the future. The cross section from Earth Solutions survey that was placed on his map does have an accurate scale, it is just stretched horizontally. He created his length for the rockery separate from the Earth Solutions map (Exhibit B). His survey maps do not show the exact width of the bulkhead. No changes occur to his bas maps once he finishes working on them. The survey is a preliminary survey. Typically, he eventually creates a final version. In Exhibit B, the map does not show any logs because the logs had nothing to do with the function of the map. The map also does not show the undercutting of the slope nor any other topographic features. It does show that the in 2013 the bank is farther out than in 2009 for most areas. The 2008 Woodman survey included portions of the Laufer property because it was necessary for that project. There is no more recent survey that is not included in the record. In 2008, Mr. Anderson used Port Townsend as a reference point and Handbury as the correction point. He used tidal benchmarks. The tidal benchmark for this area is Roche Harbor. He uses this as a vertical control for his elevation points. These points are taken using trigometric measures. Most of the property corners have elevation points recorded. He uses three points to ensure agreement which is the standard practice in surveying.

Re-Direct of Mr. Anderson (By Ms. O'Day)

Mr. Anderson testified that, it varies, but the lowest-low in San Juan is -3.5 and the highest high he has seen is 12.5. This is approximately a 15' difference. Storm surge is prevailing winds that push water up towards the land, raising the height of the water. He has visited the Woodman and

Laufer beach during the winter and seen storm surges on the properties. There is a significant difference between a nice, sunny day and a storm surge in the winter. He has no doubt that there has been slumping at the site since he began surveying it in 2007. These slumps are dynamic and moving.

Direct Examination of Mr. David Simpson (By Ms. O'Day)

Mr. Simpson's CV is exhibit W. He went to University of Washington where he studied geology, geological oceanography, and civil engineering. That was in the early 1970s. He was in the civil engineering department at the Master's level. For his thesis, he did field work on hydraulics on gravely shore. He is a senior coastal engineer. He specializes in coastal morphology. He is an engineer and a geologist. He has been working in coastal morphology for over 37 years. He does lots of work in the Northwest. He is associated with Vladamir Shepsis- who is a principal in the firm that employs Mr. Simpson. Mr. Simpson has visited the site twice before.

According to Mr. Simpson, Mr. Shepsis has also been to the Laufer site. Mr. Shepsis has been all over the world completing work for oil companies in Russia as well as work for the Italian government during the Coastal Concordia disaster. He is very highly regarded in the profession. Mr. Simpson has worked daily with Mr. Shepsis for almost 17 years. Mr. Simpson's firm worked on a beach restoration project in downtown Seattle in which they created a beach by the new sculpture park.

----Mr. Simpson is qualified as an expert----

Exhibit R is a report entitled: "Effect of the Proposed Woodman Bulkhead Extension on Beach." The Department of Fish and Wildlife requires that, for a permit, an evaluation of that data be made, and conclusions drawn about the effects of the extended bulkhead on the beach. Exhibit R is the result of data provided to Mr. Simpson. He did not setup the original data collection program for the bulkhead extension. In early 2013, Mr. Simpson was approached to review photographs of the site and make conclusions about the effect of the bulkhead extension on the beach. These photographs tracked the appearance of the beach from the time of the bulkhead expansion through the end of 2012. Mr. Simpson tried to make as much sense as he could from the information he was given. He reviewed the level of the beach berm crest, the width of the drift log accumulation at the top of the beach berm, the position of the high tide debris line, and the appearance of gravely material on the beach. He looked for trends- changes in size- that he could tell from the photographs. After going through 42 months of photographs, it appears there was no change at the site in front of the newly constructed bulkhead after the construction of the bulkhead. The width of the beach remained the same when measured against a particular light colored rock in the photographs. There were slight changes over the seasons, but there was no long term change in the beach. There was no decreasing trend in the accumulation of drift log at the top of the beach. There was no appreciable change in the beach feature. There was no trend of coarsening in the substrate of the beach. Mr. Simpson visited the beach in March, 2014 and found that the material is finer in the substrate of the beach. The beach surface material appears to be a smaller size than in the subregion of the pocket beach to the north. Mr. Simpson does not believe that the Laufer bank is a significant contributor to the substrate of the beach because a significant contributor would indicate the bluff is rapidly retreating back but it is not. There are materials on the beach that have come from elsewhere. The Frasier River is not his first choice

for contributor to this area. Waves can transport material from the bottom of the passage from the island to the west (Henry Island) and the pocket beach. Another source of material is the rocky point to the south of the site. The heavy storm-weather that reaches the site comes from the southwest. There is a refraction process in which the wave turns around the corners of these points and spread into the pocket beach where the Laufer project is located. The beach lines up with the incoming waves. The waves bring sediment depending on the material and the depth of the water. He did not study the mineralogy of the material on the bank. He does not consider the Laufer bulkhead to be a large project.

Exhibit K a technical memorandum that Mr. Simpson prepared for Laufer and Woodman. Mr. Simpson was hired by the Woodmans, and then later by the Laufers. The document was used in each project. It is a document that works for each project. For Exhibit 16- Existing Conditions- Mr. Simpson did the drawing, but almost all the work came from Star Survey. Although the identification of scarps came from Star Survey, both Mr. Shepsis and Mr. Simpson confirmed that there were scarps on the property. Mr. Simpson agrees with Mr. Anderson's testimony that there are recent scarps on the property. In regard to glacial till erosion, the surface is so weathered and exposed, it is able to erode. Exhibit 17 is a site plan by Mr. Simpson with the proposed rockeries on the Laufer beach. Although it shows a two-tiered rockery, it is one project. They are two tiers of the same rockery- of the same project. The report also includes cross section drawings. These drawings depict the rock bulkhead placed in the rockery. The width of the bluff and height of the lower tier are accurately depicted. All the work, including excavation for setting the base bluff, is at or above the toe of the bank. The schematics represent the geometry at the location of the cross-section using the survey material available. A contractor would stake along the site to ensure he met the proper elevations.

Mr. Simpson reviewed the HPA. The HPA required 18 inches into the ground for the rock to be anchored which is incorporated into Mr. Simpson's design. Therefore, the rockery will be built into the bottom of the bank, as opposed to on the outside of the toe. The lower tier of the bulkhead will be built on a 1 to 6 slope, which means for every 1 foot horizontal, go up 6 feet. This process forms a steep angle.

Mr. Simpson believes that if the rockery is built according to design it will protect the home and stairs. Although Mr. Simpson doesn't know personally if the home is threatened by scarps, the geotech report indicates that it is threatened. Mr. Simpsons states that if it were his house, he would definitely undertake a project like this to save the home. The conclusions of the report are all Mr. Simpson's. The bulkhead that is proposed will not cover surf smelt habitat- in fact, it will not cover any marine habitat, according to Mr. Simpson. In regard to reflectivity, the generalization the bulkheads increase reflectivity at the beach does not apply for this project because the till is equally reflective. The sediment measurements show no statistical difference between the measurements taken at the bulkhead and those in front of a natural bluff. Mr. Simpson was part of a 1994 study of substrates. In Mr. Simpson's opinion, based on his decades in this field, there is no qualitative evidence that a rockery, such as the one proposed today, will have a detrimental effect on the substrate. The impact of a bulkhead is based on the type of the bulkhead and the type of beach.

In regard to sea level rise, Mr. Simpson worked on a project with the City of Seattle about sea-level rise. For that project, the calculated mean sea-level requirements for the Seattle tide gage found from 1889 to 1999, the average rate of sea-level rise was 2.11mm per year. When you extend this out, it appears the rate of sea-level rise is falling. In regard to tectonic plates, there is always a potential for a subduction type earthquake. It is unrealistic to account for all the what-ifs. There was a higher loading of ice near the San Juan Islands than further south so there is a greater reaction.

Cross-Examination of Mr. Simpson (By Mr. Loring)

Mr. Simpson did not take the photographs discussed in his report. The photographs were not taken from the same, specific spot each time; however, generally, yes they were. He does not know if they were taken under the same light regimes and whether they were taken at the same time in each season. He is not aware if any actual measurements of beach elevation were taken at the time of the photographs. He did ask Star Surveying to measure the crest elevation of the beach in 2009. There is no document for this hearing that shows this measurement. Three and a half years of photographs of a shoreline like this is not long enough to observe long term effects; however, if there were going to be effects on a structure on the beach, they would be evident immediately because of the equilibrium shift. Any loss of sediment on the beach is slow. For a bulkhead project, the first place there would be any sediment loss would be next to the bulkhead. There are natural dynamics on the beach. This project's bulkhead will be set high against the bluff and is within a pocket beach so a bulkhead is appropriate. In addition to the slow loss from the bluff, there is also a slow gain which keeps things in equilibrium. If in the glacial till there is 5 percent gravel, there would be 10 cubic feet of gravel per foot of beach that would be added in 100 years to the beach. According to Mr. Simpson, this is not a significant amount. This is a calculation for the total beach profile.

According to Mr. Simpson, sediment for the beach can come from the water column. This material would be primarily along the shallow bottom, and, when the waves are such a height and strength, they can move material from the bottom to the shore. This process can move material from rocky shorelines in the area. Mr. Simpson is not able to put a percentage on different sources of sediment for this beach. He contemplated the Frasier River as a possibility for a sediment source, but there are more likely sources that are closer the project site. He is aware of a published paper about gravel and sand from the Frasier River reaching the subject beach, but he has not read the paper and does not know the paper's position. Mr. Simpson does not consider bulkheading a whole pocket beach a big project, but every project is worth careful consideration.

In regard to sea-level rise, Mr. Simpson stated that the period sea-level rise for Seattle was 2.06 is from 1889 to 2006. He is nominally acquainted with the best evidence on sea level rise. There is a large volume of evidence. He is aware that current trends ay that sea level is rising, but these models have existed since 1990 and the data does not reflect the trend. Mr. Simpson does not have a specific belief; instead, he just looks at the data. The best evidence of the future of sea level rise is the long term trends of what can be measured and these appear to be a straight line. He understands the need for projections in very large infrastructure projects.

For Mr. Simpson's report, he relied upon a site plan from Bob Anderson. He did not take elevation measurements of the beach. The bulkhead will not prevent the beach from migrating inland over time. A bluff can cause beach narrowing just like bulkheads. In regard to table 1 in Exhibit K, the far right of the table says "stabilizes bluff" which does not fully describe the impact to the supply beach material. If the Laufers attempted to stabilize the bluff by planting new vegetation, the vegetation would require a lot of maintenance. This is a non-structural option-to try and stabilize the shore with vegetation. It would require constant replanting and would not ensure success. In regard to A-5, the picture shows vegetation, but the picture does not depict the problem area-the area where waves impact the vegetation. High on the bluff there is vegetation remaining, but over on the left, it looks like there has been loss of the bank along with loss of the vegetation. This loss of vegetation is on the Woodman property.

Direct Examination of Mr. Steve Belluomini (By Ms. O'Day)

Mr. Belluomini is a licensed geologist. He has a BS in Geology. He did post-graduate work at UC Berkley. He is licensed in multiple states as both a geologist and an engineering geologist. He has 35 years of engineering geology experience, and over 40,000 hours working in that field.

Mr. Belluomini is a geomorphologist, which means he studies the science of earth forms. He has worked on landslides and substrate studies. He was a landslide specialist in California. His CV is contained in Exhibit Y.

In terms of studying the substrate and geology in the San Juan Islands, Mr. Belluomini has reviewed a number of professional publications. In addition, in San Juan County, he is involved in foundation studies, landslide studies, and geologic studies. He is working on six projects in San Juan County right now. He is also a peer reviewer in nearby Snohomish County.

Mr. Belluomini is familiar with the Laufer proposal. In his opinion, it is small and straightforward. He has a clear understanding of the geological issues with this site. There are not many options to protect the house. He has had a chance to study the substrate and bank at the Laufer property as he has been there more than a dozen times. He would not characterize the rate of erosion on the Laufer property as slow. He would characterize it as fast. That is because on the Laufer property, there are both active and inactive landslides. He characterizes the erosion rate as fast not because there is a fast continuous rate, but because of landslides that will happen and cause lots of movement in one catastrophic event. Mr. Belluomini reconciles his statement of fast Erosion with Mr. Johannessen's statement of slow erosion by the fact that he has visited the site a few dozen times, and Mr. Johannessen has been there maybe one time.

According to Mr. Belluomini, the process that is causing erosion at the Laufer site is slope movement from landsliding. The soils become oversaturated and too heavy during the winter. Combine that with water, and serious wind, and landslides occur. It is a vulnerable location for slope failure. One of the main reasons that the County rejected the permit (after initially approving it) was because they thought that a little ledge of rock would somehow buttress the slope. Exhibit 18 shows a wood retaining wall. There is top scarp right below the house shown in Exhibit 16. At this part of the site, there are slope failures, landslides, and basic erosion. Also, there is erosion at the toe of the bank. All of these features are exacerbated during winter storms.

Mr. Belluomini attached a 2006 study from Sophia Johannessen to his report (Exhibit J). The study shows that 35% of the sediment transported out of the Frasier Delta is sand, and that this sand travels. Importantly, it sometimes travels to the Laufer beach. Some of the sand on the Laufer property is derived from the Haro Strait. The bulk of the materials, the gravels that are seen on the beach, are derived from Mosquito Pass.

Mr. Belluomini wrote a report for Mr. Woodman in 2012 entitled "Correlation of Beach and Bluff Sediments", which is in the record as exhibit J. The purpose of the report was to compare the sediments exposed on the beach and soil on the beach. The conclusions and findings of the report can be applied to the Laufer property. Specifically, the conclusion that the contribution from the bluff to the beach is not measurable can be applied to the Laufer property. It is less than 1% of all the material that is exposed on the beach. Because of Haro Strait and Mosquito Pass a lot of materials not from the Laufer beach end up on the Laufer beach. In addition, the soils from the Laufer bank also exit the Laufer beach. The soils from the Laufer bank is predominantly clay and silk so it floats off. The material on the beach is not the same as the material on the bluff, and any soil that landslides onto the beach is washed away.

Mr. Belluomini picked up and touched the soil and sediment exposed on both the bluff and beach during several visits to the subject site. He concluded that the material on the bluff is composed of mainly very fine silt and clay in contrast to the material on the beach. The bluff material is not the same as the beach material. The bluff material is the finer grain. The fine sand on the bluff is finer than that of the beach. Therefore, Mr. Belluomini's conclusion is that all the soil and beach materials on the Laufer property are derived from Mosquito Pass. The sediment that comes down to the beach as the result of the landslide goes into the water because it is lighter, and it gets transported to points unknown. If nothing is done, the Laufer house will be left in peril. In Mr. Belluomini's opinion, this issue is about public safety, and public health. These landslides, if allowed to continue, will eventually undermine the house. If the slope is not buttressed, someone will get hurt. The design of the bulkhead minimizes the disturbance to the toe of the slope.

Mr. Belluomini has experience in studying the tectonic plates in San Juan County. There is an uplift of the Island as part of isostasic rebound. This is an unroofing of the ice above the ground surface. There are two major faults of interest in the County. In 2012, the Seismological Society of America published a paper regarding faulting in San Juan County. The paper concludes that there is an oblique reverse fault underlying the entire county. The fault is active. When there is movement on this fault, the upper plate can only move up. This could cause inches to a foot of uplift during an earthquake. According to USGS information, it is possible or probable that a big earthquake may hit San Juan County soon and the tectonic plate will bump up. Sea level rise does not compare to earthquake impacts. According to Mr. Belluomini, the dangers of earthquakes are underplayed.

Finally, Mr. Belluomini noted that nationwide there are 25-50 deaths per year from fault movements. Damage to the Laufer person and property can be avoided if everyone works together and recognizes the danger to the Laufers. This is a project that would be the perfect use of an exemption. There is a likelihood that this house could be damaged in the next 20, 30, or 40 years.

Cross Examination of Mr. Belluomini (By Mr. Loring)
Mr. Belluomini based his information on the land rising in San Juan on a USGS paper that was published in 2001 or 2002. He does not have a name for the document. He is not familiar with Exhibit A-18. He is not familiar with the theory that tectonic plates are able to settle after an earthquake-that an earthquake is releasing built up tension.

Mr. Belluomini does not recall the design parameters for the bulkhead as his focus is the geology of the site. He agrees with Mr. Simpson's testimony about the amount of gravel the bank was contributing to the beach. 10 cubic feet per layer feet of beach over 100 years is accurate and consistent with Mr. Belluomini's findings. This is a very small amount. For instance, a wheelbarrow is a 1/3 of yard so imagine if the beach 200 feet long and 100 cubic yards- the amount is trace.

According to Mr. Belluomini, the rate of loss is at an equilibrium with no net gain or net loss. Over four years, there has been a little bit of a net gain in some areas of the existing bulkhead. The berm on the beach was a stable feature. He has not surveyed the berm, but is basing his analysis on the maps showing the toe of the bank and berm. The rate of loss of material from the beach is slow like Mr. Simpson said. Mr. Belluomini added that the rate of gain is slow. Mr. Belluomini never asked Mr. Johannessen what rock he was looking at when he visited the site. Mr. Belluomini has taken photographs at the Laufer property, but he has not taken systematic photos over time that would show a change to the beach because he has only visited the beach since the beginning of 2012.

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In regard to the Sophia Johannessen report, Exhibit A-49, Mr. Belluomini relied on this study as a fingerprint for flow direction in the sea and transport of sediment from the Frasier Delta. A 2008 report also discusses the size of materials entering the Haro Strait, but this report is not in the record. The size of materials that Dr. Johannessen discusses in the report as moving from the Frasier Delta is very small. Two-thirds of the materials are smaller than sand and one-third is actual sand. Sand fraction sinks quite quickly while clay and silt float. The Laufer beach does not have clay and silt. He has not spoken with Dr. Johannessen, just read his articles. He would be surprised to hear that Dr. Johannesen would find it unusual for a geologist to suggest material like gravel and sand were being placed on to this beach. . Mr. Belluomini stated that gravel is not discharged from Frasier Delta.

Re-Direct of Mr. Belluomini (By Ms. O'Day)
Mr. Belluomini testified that the upper-tier is part of the entire bulkhead system.

March 25, 2014 Shoreline Substantial Development Permit Hearing

***Stephanie O'Day explained that the original FEMA application used improper terminology, thus FEMA said the project needed to be revised to need no mitigation. Ms. Shaw submitted a new Habitat Plan with different terminology in the application letter (Exhibit 10). Normally, for

these types of applications, the applicants send all the proper information to the Army Corps of Engineers who subsequently send out the relevant information to each necessary agency. In this case, the Army Corps of Engineers does not have jurisdiction because the building will be above ordinary high water mark.

***FRIENDS was given until 5pm Friday, March 14th to comment on Exhibit 5 and 10

Staff Testimony

Ms. Thompson noted that the FEMA letter is in the staff report (Exhibit 5 in the report); however, the letter in the staff report is dated February 24. FEMA policy is adopted by the Director via executive decision. Exhibits 1-11 were entered in to the record. Ms. Thompson noted that she was not part of the exemption appeal process. The application materials meet San Juan's requirements for Shoreline Substantial Permits. The Habitat Management Plan that FEMA is requiring is not tangential to the application. Rather, the plan is federal law and San Juan receives flood insurance from the federal government. County Code section 15 describes the requirements of the flood insurance program. FEMA claims that the applicant does not meet the requirements because the project has impacts. Staff is not providing a recommendation for this approval.

Applicant Testimony

Stephanie O'Day stated that the biological opinion for FEMA has been in place since 2009. San Juan County Code has not changed since 2009. The 1981 FEMA maps for San Juan County show the entire shoreline as being in a flood plain. Every other agency review has mitigation and sequencing requirements to avoid adverse effects. FEMA requires no mitigation to adverse effects being necessary before approval. If there was no mitigation, nothing would occur in the shoreline. She submitted the adopted maps of the flood plain for San Juan County.

Francine Shaw, land use planner with office of Stephanie O'Day, testified that the application meets the criteria in 18.50.210 necessary for bulkheads. The first criteria requires no bulkhead to be constructed without county review to determine if it is exempt. This project was not exempt. The second criterion is a four-prong test which determines when a bulkhead is necessary. The project meets the first two prongs: serious erosion is threatening an established use and a bulkhead is most reasonable method of stabilizing an existing bulkhead. The bluff along the Laufer property has been eroding over the last eleven years. Mr. Laufer's project has existed on his property since the 1960s. The erosion has occurred due to storm-events and wave action. Three experts testified that there was serious erosion on the site and the house needs protecting. The use that is being protected is the existing single-family home with a deck and beach access stairs. There are six types of stabilization (Exhibit K) including rock bulkhead, sheet pile, anchored logs, and several other types. The project needed to protect the bluff from wash-up debris, have a system that allowed for maintenance, a protection method that not affect surf smelt habitat, and protected eel grass habitats as well. The engineer determined that the rock bulkhead was the best solution. In regard to criterion three, this is not a new project. In regard to criterion four, the site is not a feeder bluff. In regard to criterion five, this is a class 2 beach. In regard to criterion six, the applicant has a HPA. In regard to criterion seven, the applicant has provided the four pieces of information required in the record. The applicant has met the criteria for a non-exempt shoreline permit. In regard to the FEMA response, Ms. Shaw supplied a generic section in her FEMA application which used the terminology "potential impacts." Site specific should trump generalities. Ms. Shaw consulted with Susan Powell about the FEMA situation. Ms. Powell suggested that Ms. Shaw ask FEMA what their threshold was for adverse impacts.

Ms. Powell believes there is disconnect between FEMA and other agencies about the requirements.

Stephen Belluomini stated that he inspected the Laufer site in order to make observations about the ongoing erosion. There have been several inches of soil eroding from the site. When he visited the site, there was evidence of renewed swamping. Based on the condition of the site, he would not certify the home for safe human occupancy without some kind of erosion protection. A bulkhead would make the site safe for human occupancy. Since November of 2013, there is evidence of additional soil movement on existing slumps. The house is not built on bedrock. The bedrock surface could be extended beyond the house. The bedrock is at least 20ft below the house. There is 20-25ft of dirt between the house and the bedrock at least.

Under questioning by Ms. Janet Alderton, Mr. Belluomini stated that he has inspected the Laufer property since July, 2012. In his analysis, he has found no vegetation alteration on the Laufer property. The outlet to the pipe in the back of the house has seen no water. The ground surface around the Laufer property is different than the Woodman property. In regard to stormwater affecting slope stability, stormwater is not affecting the Laufer site; instead, the erosion is occurring due to wind and wave action. The stormwater is not affecting the Woodman site either.

Public Testimony

Kyle Loring, staff attorney for FOSJ, stated that many of the photographs in the staff report are difficult to read because of the low quality. FOSJ ask that the Hearing Examiner deny the permit. The bulkhead will sever the pocket beach. The project will excavate into the bank approximately 100 years of erosion at the current rate. This speeds up the erosion by 100 years at the toes of the bank. The rock wall will be closer to 10ft. 80 percent of the slope is being retained with rock. The Hearing Examiner should review the Woodman proposal and rock wall which is adjacent. The house was built in the 1950's, but there is no erosion evidence from that time period. The house was built behind a rock outcrop. No evidence regarding the 20-25ft of dirt between the house and bedrock has been provided, and Mr. Loring believes different information was given during the exemption hearing. The rock wall may explain why the house was set back a shorter distance than others. Exhibits A-7 through A-9 is the only evidence of erosion over the years. These photographs demonstrate the lack of erosion.

In regard to the FEMA document, Mr. Loring noted that the habitat management plan is meant to protect juvenile salmon. FEMA has determined that compensating for impacts is not sufficient. There is runoff occurring or else there would be no need for a rock wall.

Ms. Tina Whitman testified that there was surf smelt spawning zone drawn on a map in the staff report. Additionally, the FEMA report has an inaccurate mean high water mark. Surf smelt is centered around mean high water and there is a plus or minus seven feet for spawning ground areas. The FEMA report notes that the surf smelt habitat stops at mean high water mark, but this is incorrect. The upper level for surf smelt spawning habitat is approximately 9.5 mark. The site plans show construction up to 10'. In regard to the vegetation claims in the FEMA report, the document says the project meets the preservation of vegetation standards. The proposal will clear the lower tier and the upper rock wall of all vegetation. The construction will no longer be

limited to landside activity. There are different provisions related to where a barge can be for waterside construction that have not been addressed by the applicants.

Mr. Loring stated that vegetation does not reclaim its natural habitat in three years. In regard to new erosion, he noted that there has been little evidence of the new erosion. The photographs provided are unclear, and they are not before-after photographs. The photos compared with exhibit A-5 show that the newer photographs have more grass than the previous ones. There is no mud flow or scarp shown in the photographs. To the extent that there is erosion, this is a small portion of the shoreline and is near the rock outcropping which will not be bulkheaded. The alleged erosion occurred during a bad winter, but the evidence of erosion is not there. In regard to slumping, again, there is no evidence. In regard to the bulkhead standards, one of the criterion is that serious erosion is affecting an established use. The applicant has not demonstrated serious erosion. The applicant has not shown anything beyond minimal erosion in a small area of the beach. Additionally, the erosion is not affecting an established use. The proposed bulkhead would be connecting to the existing Woodman bulkhead. The Laufer home is nestled behind a rock outcropping so that adds protection against erosion. Any erosion that is occurring is going uphill and, even at the rate of erosion provided by the applicant, it will take 100 years for the erosion to reach the toe of the bank. The upper rock wall requires a conditional use permit based on San Juan County Code. The cumulative impacts of severing this beach from the bank behind it will be severe and damaging to the biology of the beach. This permit needs to be denied.

Janet Alderton noted that this in the top three percent of the shoreline for biological fitness. To bulkhead the whole beach will severely impact the habitats. Ms. Alderton is Vice President of FOSJ. She has a Masters in Zoology from the University of California Berkley. She is a biologist. She has visited the site and observed the plants at the Woodman site. The Woodman site does not have natural vegetation, and it impacts the Laufer slope.

Applicant Rebuttal

Stephanie O'Day stated that the Laufers are attempting to protect their residence. This is a necessary project for the Laufers. The protection of a residence is an established use. The Woodman's yard use is arguable, but a residence is certainly a threatened established use. The home is in danger based on previous expert testimony. The storms of this year have exacerbated the situation even more than previous surveys. There are landscape scarps and bank failures in addition to the slow erosion on the site. Exhibit K shows that the possible alternatives are inappropriate at this site because of the wave energy. This application is to be viewed under the current CAO. The rockery at the toe of the bank is slightly over 30ft in length and the upper tier which is 55ft in length. The project is well designed. The claims by FRIENDs are all general claims that are not specific to this project. The HPA discusses possible construction access from the beach and provides measures that must be taken if construction occurs on the waterside. This beach is one of 124 pocket beaches in San Juan County. The applicant will deal with the FEMA issue.