GeoScience, Inc.

January 18, 2012

Ms. Wendy Farley
Senior Planner
City of Florence
via email: wendy.farley@ci.florence.or.us

RE: 16 SEA WATCH COURT RESOURCE CAPABILITY ASSESSMENT

This letter presents the results of a Resource Capability Assessment prepared in compliance with **Florence City Code, Title 10, Chapter 19: Estuary, Shorelands, and Beaches and Dunes,** which requires a **Resource Capability Assessment (10-19-1 B).** The code provisions are shown in "Arial" font and GeoScience's responses are shown in "Times" font.

3. Identification of Resources and Impacts: The required assessment need not be lengthy or complex, but it should enable reviewers to gain a clear understanding of the impacts to be expected. The application for a proposed use or activity in which a resource capability determination must be made shall submit information on the following. The Planning Director may waive inapplicable items for any particular use or project.

   a. **The type and extent of alterations expected.**

The alteration consists of installation of a water/sand filtration system including drain rock, composite geotextile, and rip rap revetment/buttress along approximately 160 feet of the east bank of the Siuslaw River, below the southernmost portion of Lot 18, all of Lot 16, and the northernmost portion of Lot 15 of the Sea Watch Estates PUD. Rip rap will extend from approximately mean low tide elevation to an average of approximately 15 feet above mean high tide elevation. In the area above high tide, rip rap is required mainly to provide a steeper slope angle near the toe of the slope to allow for a stable slope angle (50%) on the sandy slope above.

   b. **The type of resources affected.** The type of resources likely to be affected by the proposed action shall be inventoried. The City shall assist the applicant in locating sources of information/ Sources which can be used include: Lane County Coastal Resources Inventory, environmental impact statements for the Siuslaw River, or other published information concerning the Siuslaw Estuary, or more current resource information from federal or state agencies, the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians or other public sources.

Potential resources in estuarine environments were obtained from several sources, including the Lane Code, the Lane County Coastal Inventory, Lane County's Dredge Material Disposal Plan Update, and the US Fish and Wildlife National Wetlands Inventory. Based on these publications, in the case of the Lower Siuslaw River, potential estuarine resources include:

Exhibit G

- Tidal marshes and wetlands.
- Silvicultural resources.
- Florence Dunal Aquifer (groundwater resource)
- Habitat for threatened and endangered fish species.
- Habitat for marine mammals, birds, and invertebrates.
- Riparian vegetation.
- Cultural resources.
- Aesthetic resources.
- Navigation
- Recreation

These potential resources and the effect of the proposed project on them are discussed in the following paragraphs.

Tidal Marshes and Wetlands

Such resources are clearly not present at this site, as the lower bank at the site consists of a nearly vertical MTD bluff over a narrow MTD shelf. There are no land forms present that would support tidal marshes or wetlands. Consequently, this stretch of the east bank of the Siuslaw River has no mapped or inventoried wetlands or tidal marshes (see also Tidal Wetlands Prioritization, Siuslaw River Estuary, Oregon, Green Point Consulting, 2005) and the National Wetlands Inventory.

Silvicultural Resources

The steep bank consisting of dune sand above the MTDs has never (since aerial photos have been available)been vegetated with marketable timber, and, in the project area, is currently not vegetated. The unstable sand conditions along the steep bank are not suited to growing trees other than shore pines which, although adapted to the unstable environment, have little commercial value.

Florence Dunal Aquifer

The Florence Dunal Aquifer is the sole source drinking water resource for the City of Florence. It is recharged by precipitation falling on the partly stabilized dunes of the Florence Dune Sheet. The City's well field is located in the area between Munsel Creek and the North Fork of the Siuslaw River. In general, groundwater movement is from the central portion of the dune field towards the river(s) present to the east (North Fork), south, and west (Siuslaw River). The project site is located along the extreme western boundary of the aquifer, in an area where no recharge of the aquifer occurs. On the contrary, the main reason for the instability and erosion of the slope is the continual discharge of groundwater from the aquifer. Therefore, the proposed work which is designed to place a system allowing the groundwater to discharge without mobilizing the sand, will not adversely affect the groundwater resource either in quantity or quality.

Habitat for Threatened and Endangered Fish Species

The Lower Siuslaw River is habitat for several threatened and endangered species of fish, including the Southern Population North American Green Sturgeon, the Southern Pacific Eulachon, and Oregon Coast Coho Salmon. In addition, several other species of salmonids and other fish species, which are not threatened and endangered, are present in the Siuslaw drainage. The Oregon Department of Fish and Wildlife concluded that the fish would not be adversely impacted provided that precautions were taken during construction to preclude the release of petroleum products into the river. The USACE issued a similar opinion in their 5/11/2011 letter to NMFS. After requesting additional information and meeting at the site, NOAA-NMFS concurred and stated in an Endangered Species Act Biological Opinion dated 12/16/2011, that the proposed revetment is:

"Not likely to adversely affect the ...Green Sturgeon, Pacific Eulachon...(or) jeopardize the continued existence of Oregon Coast Coho." (P1 of attached NMFS letter).

As part of the additional information requested by NMFS, GeoScience presented evidence (in a 9/2/2011 letter, attached) showing that the work would actually result in improved habitat for marine tidal invertebrates and kelp, as the rip rap (photos taken at revetment below Lots 18 to 24 of Sea Watch Estates) provides a comparatively stable substrate which the eroding dune sand and MTDs do not. During and after the site visit Mr. Jeff Young, the NOAA biologist visiting the site, concurred with this assessment. He also indicated that larger rip rap might benefit young salmonids as it could provide larger void spaces for the fry to hide in during the period of acclimatization to the saline environment. In addition, the work proposed for the site is expressly designed to preclude mobilization of dune sand from the base of the slope by groundwater discharging there. Since the failure occurred in late 2010, it is estimated that more than 2,000 cubic yards of sand have been deposited in the river where they have subsequently been removed by tidal currents. This results in significant turbidity in the river and smothers kelp and sessile benthic organisms which might otherwise flourish in the shallow water. The proposed work will eliminate this source of turbidity..

Habitat for Marine Mammals, Birds, and Invertebrates

A similar argument applies to other species utilizing the lowermost Siuslaw Rive. In its natural state, the tidal portion of the bank in this area is devoid of sessile benthic organisms (see photos in 9/2/2011 GeoScience letter, attached). The MTDS tend to form steep-sided benches which are devoid of vegetation and small-scale surface irregularities which could serve as refuges to small fish. Larger rip rap, on the other hand, which is not moved by wave action, tends to be densely overgrown with kelp, barnacles, mussels, and other invertebrates (see site photos in attached GeoScience 9/1/11 letter). This results in a significantly more diverse micro-ecosystem than sustained in the areas of the bank not so protected. Therefore, contrary to a common mis-conception, in this brackish/marine environment, rip rap revetments can demonstrably be shown to improve habitat for several species, including sea otters who depend on marine crustaceans as a significant food source.

Riparian Vegetation

Riparian vegetation is essentially lacking along the lower-most 10 feet of the river bank in the as-yet undisturbed areas adjacent to the project site, located mostly to the south. Such vegetation, if it was present prior to the slope movement of 12/26/2010, has been completely obliterated by the slide and no vegetation has been able to re-grow on the continually eroding sandy slope. In other, similar areas in close proximity to the subject site, invasive species, especially Himalayan Blackberry tend to dominate on unstable sand slopes, depriving nativespecies of sunlight. This, in turn, leads to more rapid erosion as the blackberry vines tend to be shallowly rooted at a few, widely-spaced points which results in mostly bare sand under the vine "canopy".

The proposed work includes re-vegetation (planting) of the sand slope in the middle and upper portions of the bank. This can only be achieved if the toe of the slope is stabilized and the sand slope is reduced to a stable angle of 50 %, as proposed. Therefore, the impact of the proposed project on vegetation along the eroding portion of the river bank is expected to be positive.

Cultural Resources

The site is underlain by a recently stabilized sand dune which is part of the Florence Dune Sheet. It is probable that the site has been subjected to shifting sands for the last several thousand years. As a result, it is unlikely that Native American Artifacts or middens are present at this location. No other artifacts have been noted along this stretch of the MTDs during the assessment. Ms. Agnes Castronuevo of the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw River Indians will be notified prior to the start of work at the site. If artifacts are noted during the limited excavation, the work will be stopped until the resource can be assessed by a qualified archeologist.

c. The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary.

Water Quality and Other Physical Characteristics of the Estuary and Living Resources

Please see above under Habitat(s).

Recreation

Due to the steepness of the bank and in this vicinity, and the locally dense vegetation in the higher portions of the banks, access to the estuary from the top of the eastern bank is difficult to impossible along this stretch of the river. At high tide, the cliff on one side and the dense vegetation of the middle to upper bank make traversing the slope impossible without a brush knife or similar device. Of course, the vegetation is not present in the immediate slide area, but, at high tide it cannot be accessed from either the north or the south. In addition, the vertical cliff of the middle and upper

shelves of the MTDs make access to the bank from a boat nearly impossible. There is no evidence that this area has been used in the past for recreational purposes such as fishing from the bank or as an access point for wind-surfers. Therefore, due to a lack of recreational uses, these will not be impacted by the project.

Aesthetic Use

The work area is not visible from the landward side unless the viewer is standing directly at the top of the bank. The opposite bank of the Siuslaw is located approximately 800 feet west, and, at this location, the South Jetty Road is located behind additional dunes. As a result, the proposed project is visible mainly to people in boats on the Siuslaw. There are numerous similar rip rap revetments located along the east bank of the Siuslaw in the immediate and larger vicinity. Once the slope has been re-vegetated, hiding most of the existing sheet pile wall, it is expected that the visual impact of the repaired bank is less than the current impact of the failing bank.

Navigation

The river west is navigable west of the project site, and is periodically dredged for this purpose. The center of the channel is marked by navigation devices, and is located approximately 300 feet west of the eastern bank. The river is used by the Coast Guard for exercises, by commercial and private fishing boats, and pleasure craft. The proposed work does not extend beyond the western edge of the lower MTD shelf which, for all practical purposes, forms the limit of the navigable channel. Therefore, no impact is expected to navigation from the proposed project.

d. The methods which could be employed to avoid or minimize adverse impacts.

The only potential adverse impacts identified during meetings at the site in cooperation with the Oregon Department of State Lands, Oregon Department of Fish and Wildlife, the US Army Corps of Engineers, and NOAA National Marine Fisheries Service have beenrelated to work required to put the proposed system into place. They consist mainly of concerns regarding potential leaks or spills of petroleum products from the equipment required to perform excavation and placement of the filter system and revetment/buttress. In addition, there is some concern that turbid water may enter the river during the work.

Per the communication with the agencies (text of 5/4/11 email to Jason Kirchner, ODFW and Gloria Kiryuta, DSL, forwarded to City of Florence Development Department staff), these concerns are addressed by the following measures:

The contractor will ensure that the equipment will be steam-cleaned prior to arrival at the site. Several 5-gallon spill kits will be on-site and a 55-gallon spill kit less than 5 minutes away. Oil-absorbent booms will be placed in areas on the equipment where leaks might occur. An oil-absorbent boom will be placed into the river around the site as an additional precaution.

The plan calls for placement of rock only within the current (or previous) foot-print of the older revetment. No rock will be placed into the deeper water off the MTD shelf. The work in the area between low and high tide will be conducted only when the ground is exposed by the receding tide. The timing of this part of theproject will be adjusted to coincide with the minimum tide elevations which is expected to result in avoidance or minimization of turbidity in the adjacent Siuslaw River.

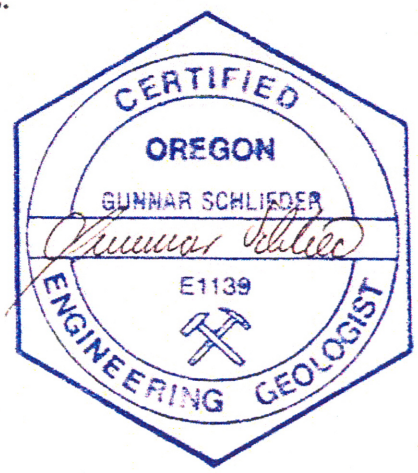
The work area will be accessed only by land-based equipment, thereby minimizing any impacts to the MTD shelf which would probably occur if a barge were used to conduct the work.

I hope the foregoing adequately serves to address the requirements of the Florence City Code regarding the Resource Capability Assessment. If you have any additional questions, please do not hesitate to contact me at (541) 607-5702.

Sincerely
GeoScience, Inc.

Gunnar Schlieder, Ph.D., CEG

att: 4/12/11 GeoScience Addendum to Joint Permit Application, 5/11/11 USACE Letter to NMFS, 8/8/11 NMFS Letter to USACE, 9/2/11 GeoScience letter to USACE, 12/16/11 Letter of Concurrence from NMFS to USACE.



Expires 12/31/2012

CITY OF FLORENCE
PHASE I SITE INVESTIGATION REPORT

Applicant

Richard and Patricia Lukens

Date

1/17/2012

Proposal or Project

Bank Failure Mitigation/Bank Protection

Map No. 18-12-15-33

Tax Lot 2000

Comprehensive Plan Designation

Low-Density Residential

Purpose of Proposal or Project (attach additional sheets, as needed)

Stabilize failing/eroding bank of Siuslaw River below home.

Zoning District

Residential Shoreland

Street Address

16 Sea Watch Court, Florence OR 97439

Overlay District

Conservation Estuary

Based on submitted information, zoning and comprehensive plan requirements, and the completed Site Investigation Report, this proposal **does** ~~/ does not~~ comply with Title 10 of the City Code and the Comprehensive Plan. The proposal **will** ~~/ will not~~ achieve the stated purpose. The site and/or building design ~~will /~~ **will not** have adverse impacts and **will** ~~/ will not~~ mitigate any adverse impacts.

The completed Site Investigation Report is available at the Planning Department.

This investigation was done by:

CERTIFIED OREGON GUNNAR SCHLIEDER E1139 ENGINEERING GEOLOGIST

Gunnar Schlieder, Ph.D., CEG, GeoScience, Inc.

Print

Signature

President

Title

Expires 12/31/2012

PHASE 1SITE INVESTIGATION
INITIAL PROPOSED DEVELOPMENT APPLICATION CHECKLIST

YES	NO		
__X__	____	1.	LOCAL ZONING REGULATIONS Does the proposed development site plan conform to City, or County Zoning Regulations regarding setback lines and other code provisions? (Contact the City or County Engineer for details.)
		2.	COMPREHENSIVE PLAN SETBACK LINE OR DESIGNATION
__X__	____		a. Has a Coastal Construction Setback line (CCSBL) been adopted for this County or city? (Inquire from the County or City Engineer.)
____	_N/A		b. If a CCSBL has been adopted for this County or City is the proposed site seaward of the CCSBL?
____	_N/A		c. If the proposed site is seaward of the adopted CCSBL, has application for a variance or exception been made to the Planning Commission having

Exhibit H

YES	NO	
		jurisdiction?
		3. DUNAL FORMS
		a. Does the property contain any of the following dune formations?
____	__X_	1. Active Dune
__X__	____	2. Newer Stablized Dune
__X__	____	3. Older Stablized Dune
____	__X_	4. Deflation Plan
____	__X	5. leading Edge of Sand dune
____	__X_	6. Foredune
		3. IDENTIFIED HAZARDOUS CONDITIONS
__X__	____	a. Has any portion of the property been identified as being affected by any potential or existing geological hazard? (Contact County or City Planning Departments for information published by the State Department of Geology and Mineral Industries, US Department of Agriculture-Soil Conservation Service, US Geological Survey, US Army Corps of Engineers and other government agencies.)
		b. Are any of the following identified hazards present?
____	__X_	1. foredune
____	__X_	2. Active Dunes
__X__	____	3. Water erosion
____	__X_	4. Flooding
__X_	____	5. Wind erosion
__X__	____	6. Landslide or sluff activity
	X	7. leading edge of active Sand Dune
	X	c. Are there records of these hazards ever being present of the site? Describe: Bank failed previously (1997). Mitigation consisted of sheet pile wall and gabion baskets. Sheet pile wall remains.
		4. EXISTING SITE VEGETATION
____	__X_	b. Does the vegetation on the site, afford adequate protection against soil erosion from wind and surface water runoff?
____	__X_	c. Does the condition of vegetation present constitute a possible fire hazard or contributing factor to slide potential? (If answer is Yes, full details and possible remedies will be required.)
		5. FISH AND WILDLIFE HABITAT
____	__X_	a. Does the site contain any identified rare or endangered species or unique habitat (feeding, nesting or resting)?
____	__X_	b. Will any significant habitat be adversely affected by the development? (Contact Oregon Department of Fish and Wildlife,)
		6. HISTORICAL AND ARCHEEOLOGICAL SITES
____	__X_	Are there any identified historical or archaeological sites within the area proposed for development? (Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians).)
		7. FLOOD PLAIN ELEVATION
____	__X_	a. If the elevation of the 100 year flood plain or storm tide has been determined,

YES	NO	
		does it exceed the existing ground elevation at the proposed building site? (Contact the Federal Insurance Administration, City or County Planning Departments for information on 100 year flood plain. Existing site elevations can be identified by local registered surveyor.)
____	_N/A	b. If elevations of the proposed development is subject to flooding during the 100 year flood or storm tide, will the lowest habitable floor be raised above the top of the highest predicted storm-wave cresting on the 100 year flood or storm tide?
		8. CONDITION OF ADJOINING AND NEARBY AREAS
		Are any of the following natural hazards present on the adjoining or nearby properties that would pose a threat to this site?
____	__X_	a. Active dunes
____	__X_	b. foredune
____	__X_	c. Storm runoff erosion
____	__X_	d. Wave undercutting or wave overtopping
__X__	____	e. Slide areas
____	__X_	f. Combustible vegetative cover
		(Contact County and City Planning staffs for local hazard information.)
		9. DEVELOPMENT IMPACTS
____	__X_	a. Will there be adverse off-site impacts as a result of this development?
		b. Identify possible problem type
____	__X_	1. Increased wind exposure
____	__X_	2. Open sand movement
____	__X_	3. Vegetative destruction
____	__X_	4. Increased water erosion (storm runoff, driftwood removal, reduction of foredune, etc.)
____	__X_	5. Increased slide potential
____	__X_	6. Affect on aquifer
__X__	____	c. Has landform capability (density, slope failure, groundwater, vegetation, etc) been a consideration in preparing the development proposal?
__X__	____	d. Will there be social and economic benefits from the proposed development?
		e. Identified benefits
____	____	1. New jobs
__X__	____	2. Increased tax valuation
__X__	____	3. Improved fish and wildlife habitat
____	____	4. Public access
__X__	____	5. Housing needs
____	____	6. Recreation potential
__X__	____	7. Dune stabilization (protection of other features)
____	____	8. Other _____
		10. PROPOSED DESIGN
__X__	____	a. Has a site map been submitted showing in detail exact location of proposed structures?
__X__	____	b. Have detailed plans showing structure foundations been submitted?
__X__	____	c. Have detailed plans and specifications for the placement of protective structures been submitted if need is indicated?
__X__	____	d. Has a plan for interim stabilization, permanent revegetation and continuing

YES	NO	
		vegetative maintenance been submitted?
		e. Is the area currently being used by the following?
____	__X_	1. Off-road vehicles
____	__X_	2. motorcycles
____	__X_	3. horses
____	_N/A	f. Has a plan been developed to control or prohibit the uses of off-road vehicles, motorcycles and horses?

11. LCDC COASTAL GOAL REQUIREMENTS

__X__	____	a. Have you read the LCDC Goals affecting the site? (contact LCDC, City or County office for copies of Goals.)
____	_X__	b. Have you identified any possible conflicts between the proposed development and the Goals or acknowledged comprehensive plans? (If so, list them and contact local planning staff for possible resolution.)
__X__	____	c. Have all federal and state agency consistency requirements been met? (Contact local planning office.)
__X__	____	d. Has applicant or investigator determined that the development proposal is compatible with the LCDD Beaches and Dunes Goal and other appropriate statewide land use planning laws?

Rev. 4/09