



SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

**NATURAL RESOURCE ASSESSMENT REPORT
FOR**

Pine Beach and Ocean Boulevard Properties

T1N R10W Sec.7DD TL 114-123
T1N R10E Sec.7DA TL 3000, 3100, 3104, 3203, & 3204
Tillamook County, Oregon

Prepared for

Wendie Kellington
Kellington Law Group PC
PO Box 2209
Lake Oswego, OR 97035

Prepared by

Juniper Tagliabue
&
Martin Schott
of
Schott & Associates, Inc.

Date:

January 2023

Project #: 3045

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Introduction

Schott & Associates (S&A) was contracted to prepare a natural resource assessment report for Pine Beach Subdivision (T1N R10W Sec.7DD, Tax Lots 114-123) and Ocean Beach Boulevard Properties (T1N R10E Sec.7DA Tax Lots 3000, 3100, 3104, 3203, and 3204; Rockaway Beach, Tillamook County, Oregon; Figures 1 & 2). In 2021, riprap revetment was constructed along the ocean side of the subject properties to protect the properties from erosion and reduce the risk of coastal flooding. As stated in the Land Use Board of Appeals (LUBA) Final Opinion, Tillamook County's approval of the structure must "*demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices.*" This report is provided to meet that requirement.

Site Description and Background

The study site includes 15 beach front lots, 12 of which feature single-family residential dwellings, and three of which are undeveloped. The lots are zoned for urban-density residential uses, and as of December 2021, feature a rock rip-rap revetment which was constructed along the western (ocean) side of the properties.

In the early 1990s, the coastal pine forest extended approximately 330 feet to the west from where Pine Beach Loop was constructed, and sand was actively being deposited on the beach. In the mid to late 1990s, this trend suddenly reversed, resulting in rapid erosion of the beach. By the year 2011, nearly 100 feet of the pine forest had been eroded up and down the coastline in this area. Around 2005, a protective wall of exposed rip-rap was constructed to protect the trailer park north of the subject properties. This rip-rap has stopped the erosion along its frontage, but the erosion has continued adjacent to the subject properties and to the south. The trailer park now juts out approximately 100 feet west of the existing forest edge.

The beach erosion is due to several factors. The initial erosion probably occurred during King tides and one or more major storm events associated with the El Niño climate phenomenon. Climate change and the rise in ocean levels are probably contributing factors. Loss of approximately 134 feet of coastal forest since 1994 is evident from review of recent and historical aerial photographs (Fig. 3a-b). The riprap was designed in accordance with Tillamook County codes to protect the properties from rapid erosion which was occurring along the beach and putting homes, lives, and infrastructure at risk. The revetment was constructed in 2021 and was completed by covering with sand and planting with vegetation for further stabilization.

Methods

Schott & Associates visited the site on January 23, 2023, to assess the condition and impact of the onsite revetment with respect to any onsite or adjacent natural resources and collect site photographs (Appendix B).

Offsite mapping including aerial photographs, National Wetland Inventory (NWI), and other available natural resource mapping was reviewed along with previous permitting documents (WEST Consultants Technical Memorandum; 2021, LUBA Final Opinion; 2022).

Results

Natural Resources

Maps and aerial photographs were reviewed, and nearby natural resources were identified for any potential effects from the revetment. Identified significant resources consist of the Pacific Ocean and adjacent beach to the west and Smith Lake to the east. The forested area between Pine Beach Loop and the Ocean was not identified by the County as a significant natural resource.

The Pacific Ocean is located directly adjacent to the west of the subject property boundaries. The ocean is actively eroding the beach as documented in WEST Consultant's technical memorandum, historical aerial photographs, and photographs provided by property owners. The revetment was constructed to protect property including homes and infrastructure from further beach erosion. Construction of the revetment does not result in any changes to functions of either the ocean or the beach, apart from protecting life and property. Fauna and flora inhabiting the shallow waters of the ocean directly west of the BPS shall not experience any different conditions as a result of its installation. Vegetation is unable to root within the sandy intertidal zone of the beach. Animal species present on the sandy beach include a variety of small species which are generally unseen. Larger invertebrates, including crustaceans and mollusks may also be present. These species burrow in the sand during periods of exposure for protection and emerge to forage when the tides allow. These species are generally dependent on detritus provided by the incoming tides and deposited at the high tide line. Once in the intertidal zone, the organic detritus is broken down and made available by the mechanical force of waves pounding against the shore and the activity of the many different organisms that live and forage there. These ecological systems will be unaffected by the presence of the BPS.

Smith Lake is a 35-acre lake located approximately ¼ mile east of the site, along the west side of Highway 101. The lake is primarily surrounded by private property including a recreational camp. It is stocked with rainbow trout and cutthroat trout for fishing and large-mouth bass are also known to be present. The lake is separated from the revetment by existing residential development and roadways including Pine Beach Street and the old Pacific Highway. The impacts from the revetment are limited to protection of the adjacent properties and no impacts to Smith Lake from its construction were identified or anticipated.

Site Visit

S&A accessed and viewed the site from the top of the revetment on the lot line between lots 116 and 117. The revetment was composed of riprap covered with sand. After

construction it was replanted with a variety of native species. At the time of the site visit it was approximately 30% vegetated, the predominant cover being beach grass (*Ammophila sp.*) with approximately 1% each of shore pine (*Pinus contorta*), Sitka spruce (*Picea sitchensis*), salal (*Gaultheria shallon*), evergreen huckleberry (*Vaccinium ovatum*), Pacific wax myrtle (*Myrica californica*), volunteer bentgrass (*Agrostis sp.*) and lupine (*Lupinus sp.*). The beach grass is a stabilizing species which forms stiff, hardy, clusters of grass that can reach nearly four feet in height. The rhizome mat formed by the plant facilitates fast colonization over the immediate area. One small clump can produce 100 new shoots annually. It is known for its ability to trap sand and thereby increase the height and stability of the dunes it inhabits.

The erosion that has occurred since the mid 1990 resulted in a loss of what is typically thought of as foredunes, which are the dunes forming closest to the ocean. Foredunes generally have unstable sand and sparse to moderate vegetative cover. As more plants establish and succession occurs, dunes convert over time to shrublands dominated by salal and evergreen huckleberry followed by forests dominated by shore pine and eventually Sitka spruce and western hemlock. No foredunes remain in front of the subject property and the revetment was installed to protect what remains of the backdunes and associated coast forest community as well as the homes.

The forested area to the south appeared to be relatively flat and before loss of the foredunes would have been considered an interdunal area or secondary (back) dunes. The foredunes are essentially gone, with these more established dunes now directly exposed to ocean erosion. These are conditionally stable dunes that have become wind stabilized by diverse vegetation and soil development. They are now acting as foredunes. A mature forest of pine trees has established on these stabilized dunes.


The forested dunes have not been affected by the BPS installed at Pine Beach. One season after installation, any change in erosion pattern would have already revealed itself. Having said that, we do expect the ocean to continue to erode these forested dunes, albeit at a somewhat slower rate than the younger foredunes that were eroded from between the mid-to-late 1990s to the 2020 time period. Assuming that current erosion patterns continue, the only feasible way to preserve these forested dunes over the long term is to provide sand renourishment and/or PBS similar to the structure installed at Pine Beach.

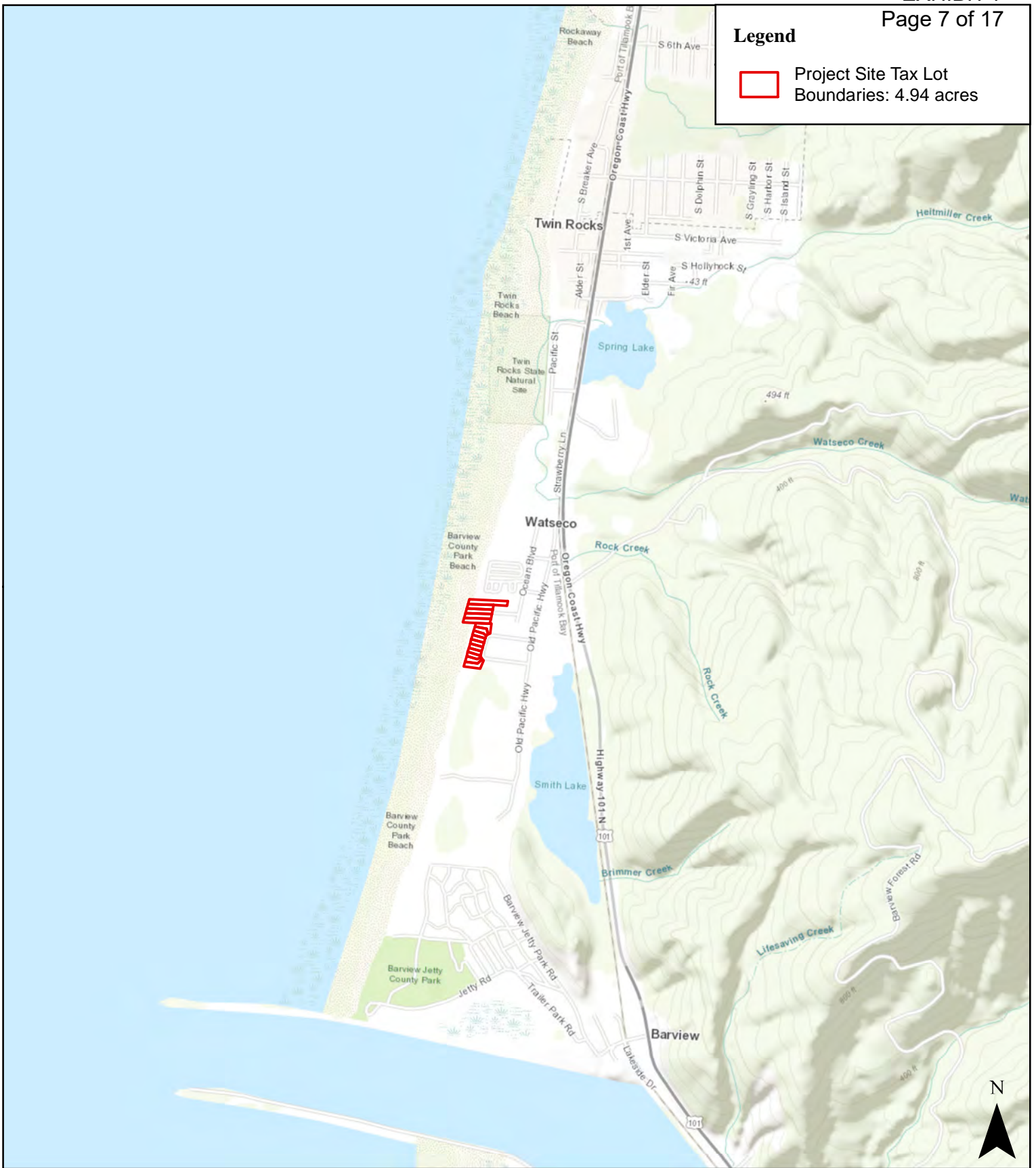
Summary

In response to the LUBA Final Opinion and OAR 660-004-0020(2)(d) the site and revetment have been assessed by Martin Schott, PhD to identify any natural resources affected or potentially affected by the activity. The Pacific Ocean, adjacent beach, and Smith Lake were identified as the only nearby natural resources. The revetment is located entirely on private property and was constructed to protect life and property associated with those lots as well as potential for coastal flooding of additional properties further inland. The beach has a Goal 17 "Coastal Shorelands" exception. Construction was found to be compatible with surrounding natural resources with no impacts to said resources.

FIGURE 1: PROJECT VICINITY MAP

Legend

 Project Site Tax Lot
Boundaries: 4.94 acres



Date: 1/25/2023

Data Source: ESRI, 2023; Tillamook
County GIS, Dept., 2023

Figure 1. Location Map



Pine Beach Subdivision Project Site: S&A # 3045

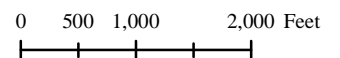



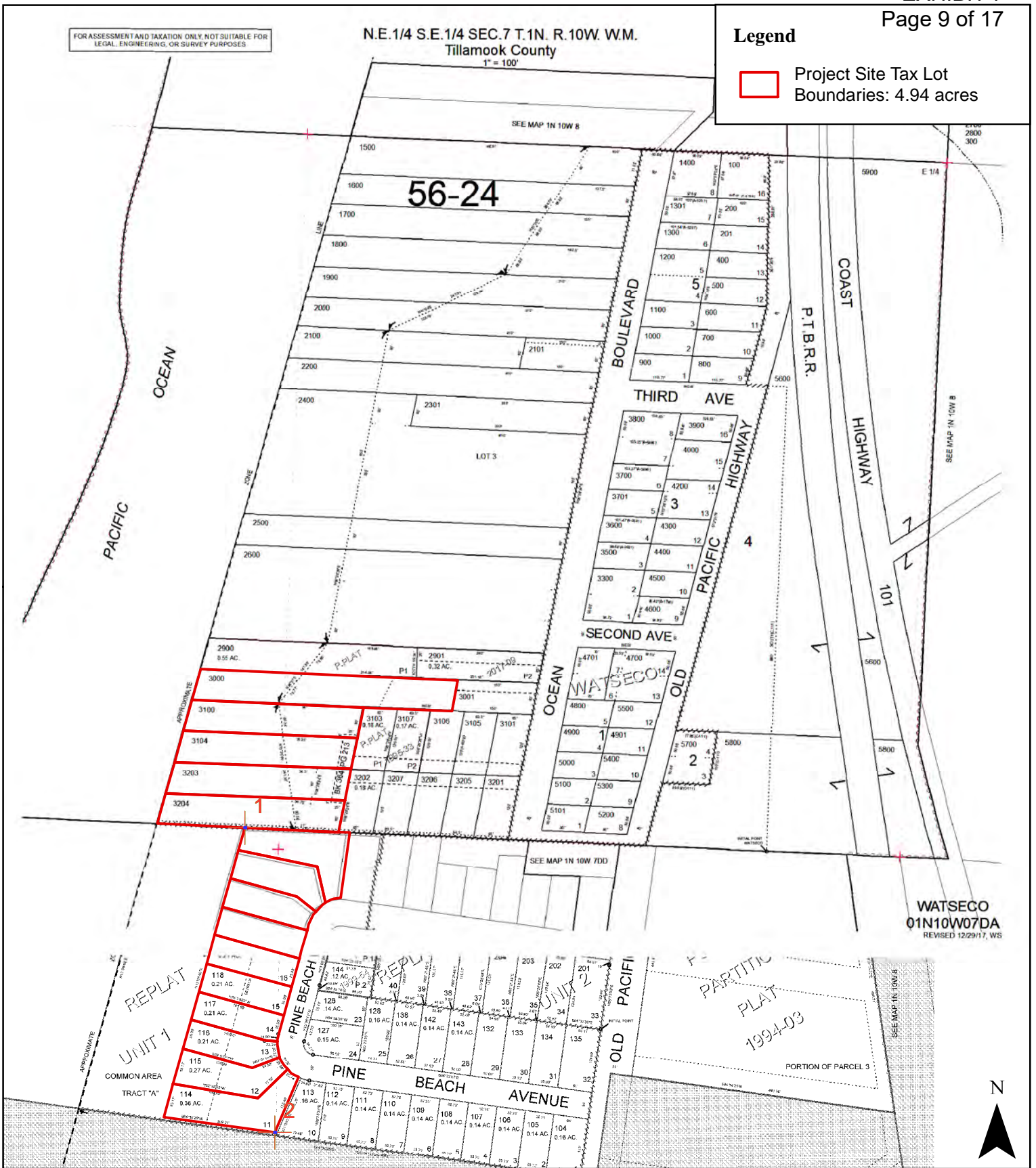
FIGURE 2: TAX MAP

FOR ASSESSMENT AND TAXATION ONLY. NOT SUITABLE FOR
LEGAL, ENGINEERING, OR SURVEY PURPOSES

N.E. 1/4 S.E. 1/4 SEC. 7 T.1N. R. 10W. W.M.
Tillamook County
1" = 100'

Legend

 Project Site Tax Lot
Boundaries: 4.94 acres



WATSECO
01N10W07DA
REVISED 12/29/17, WS

Date: 1/25/2023

Figure 2. Tax Map - 01N10W07DA &
01N10W07DD

Data Source: ESRI, 2023; Tillamook
County GIS, Dept., 2023



Pine Beach Subdivision Project Site: S&A # 3045

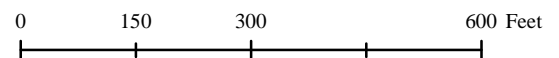

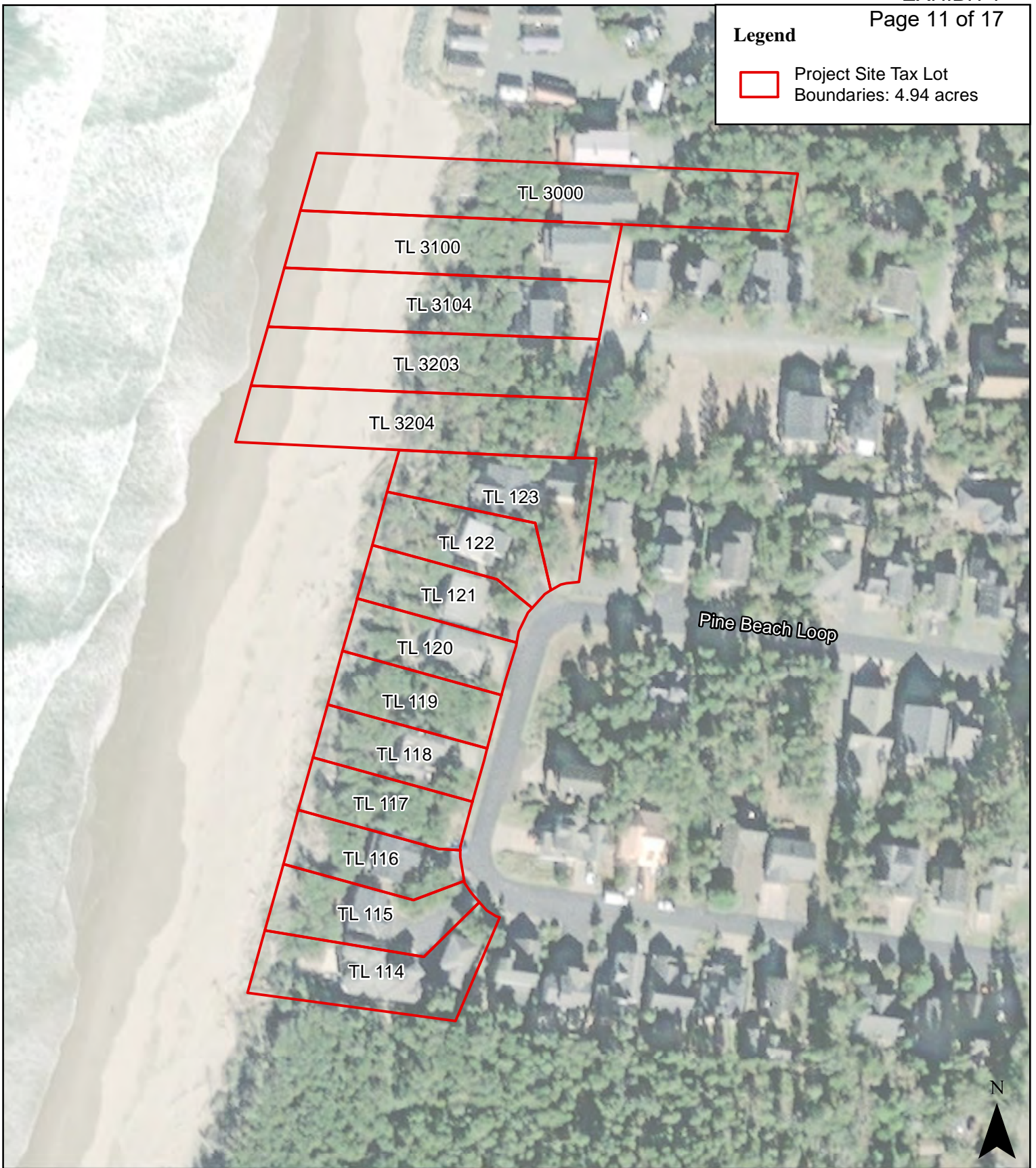


FIGURE 3A-B:
RECENT AND HISTORICAL AERIAL PHOTOGRAPHS

Legend

-  Project Site Tax Lot
- Boundaries: 4.94 acres



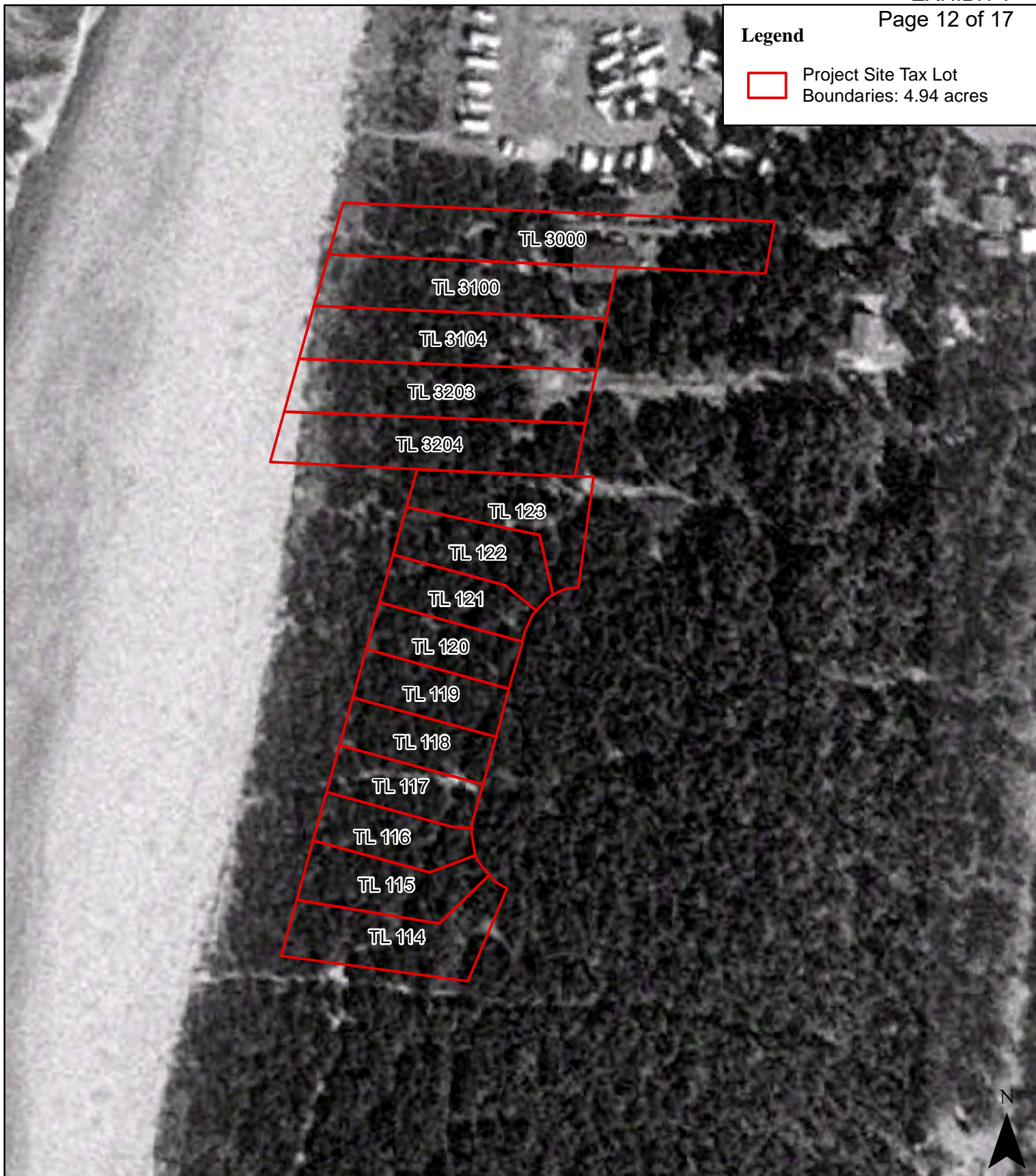
Date: 1/25/2023

Data Source: ESRI, 2023; Tillamook
County GIS, Dept., 2023

Figure 3a. Recent Aerial Imagery -
April 15, 2021

Legend

-  Project Site Tax Lot
- Boundaries: 4.94 acres



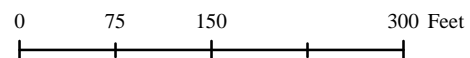
Date: 1/25/2023

Data Source: ESRI, 2023; Tillamook County GIS, Dept., 2023

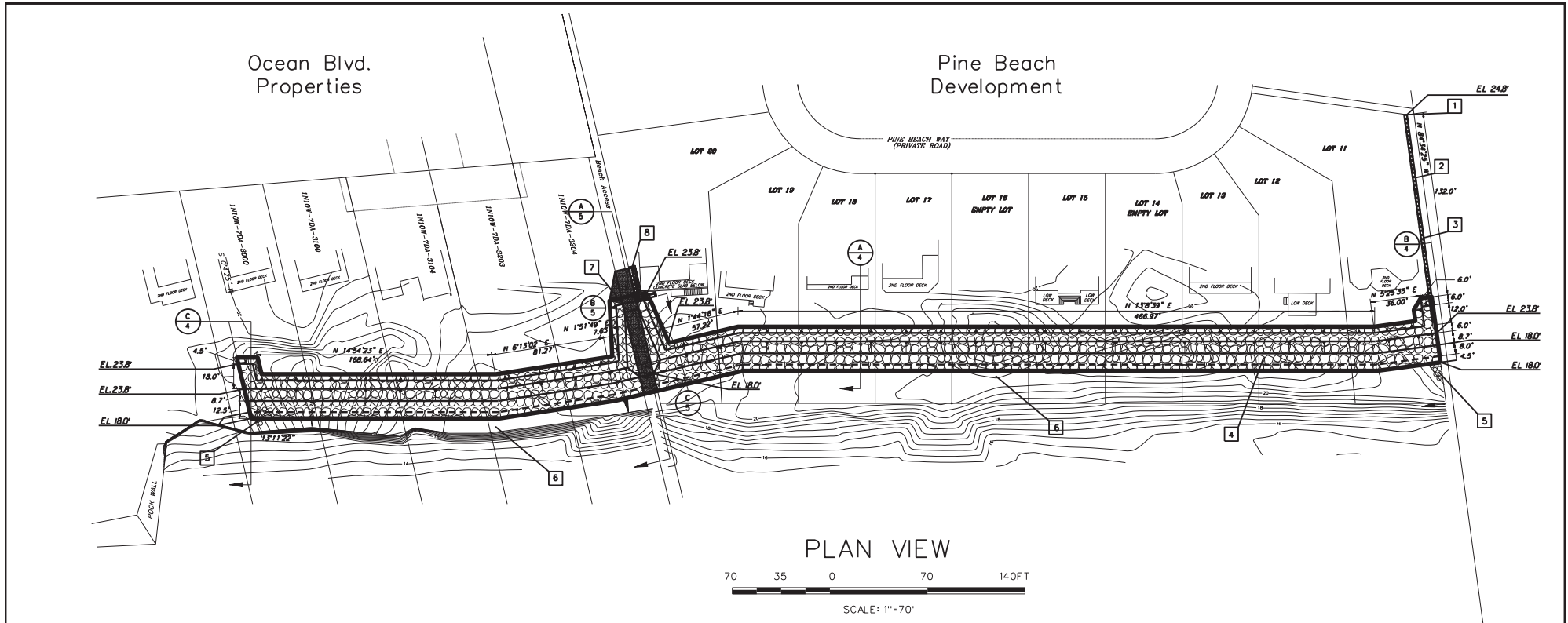
Figure 3b. Historical Aerial Imagery - Spetember 3, 1994



Pine Beach Subdivision Project Site: S&A # 3045



APPENDIX A: SITE PLAN



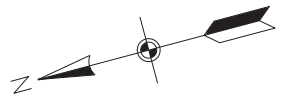
NOTES

1. CONTROL POINT AT CORNER OF WOOD FENCE ALONG THE SOUTHERN BOUNDARY OF PINE BEACH DEVELOPMENT LOT 11. X-COORDINATE OF 7,320,174.35 FT AND Y-COORDINATE OF 717,513.41 FT (HORIZONTAL DATUM OF NORTH AMERICAN DATUM OF 1983, STATE PLANE OREGON NORTH, FEET).
2. CONSTRUCT ECOLOGY BLOCK STRUCTURE. SEE DETAIL D ON SHEET 4.
3. REMOVE AND REPLACE EXISTING FENCE.
4. CONSTRUCT ROCK REVETMENT OVER GRANULAR FILTER. ROCKS SHOULD BE UNIFORM GRADATION RANGING IN SIZE FROM 3 TO 4 FT IN DIAMETER WITH THE ROCK HAVING A MINIMUM SPECIFIC GRAVITY OF 2.65. THE ROCK SHOULD CONSIST OF DENSE, NATURAL ROCK FRAGMENTS. ROCKS SHOULD BE RESISTANT TO WEATHERING AND TO WATER ACTION; AND FREE FROM OVERBURDEN SPOIL, SHALE AND ORGANIC MATERIAL. SHALE AND ROCKS WITH SHALE SEAMS ARE NOT ACCEPTABLE. THE DURABILITY INDEX AND PERCENT ABSORPTION SHALL BE DETERMINED BY AASHTO T 210 AND AASHTO T 85, RESPECTIVELY. COVER ROCK REVETMENT WITH SAND MATERIAL. SEE DETAIL A ON SHEET 4.
5. PLACE 7 3-FIT-DIAMETER ROCKS AT AN ELEVATION OF 20.8 FT AND RANDOMLY SPACED NEAR THE NORTHERN AND SOUTHERN END OF PROPOSED STRUCTURE.
6. SAVE EXISTING LARGE LOGS, AND PLACE THROUGHOUT BENCH AREA. REPLANT DISTURBED AREA WITH NATIVE GRASS AND TREES. PLANTING COMPLETED BY OWNERS.
7. CONSTRUCT RAMP. SEE DETAIL ON SHEET 5.
8. CONSTRUCT ECOLOGY BLOCK STRUCTURE AND PLACE SAND FILL ON THE SOUTH AND EAST SIDE. SEE DETAIL ON SHEET 5.
9. ALL ELEVATIONS ARE BASED ON THE VERTICAL DATUM OF NORTH AMERICAN VERTICAL DATUM OF 1983.

REGISTERED PROFESSIONAL
ENGINEER
67050

OREGON
7/9/2001
CHRIS D. BAHNER

RENEWAL DATE: 12-31-2021



**PINE BEACH DEVELOPMENT
AND OCEAN BLVD. PROPERTIES
ROCK REVETMENT
TILLAMOOK COUNTY**

RETVEMENT LAYOUT

SHEET
NO.
3

APPENDIX B: SITE PHOTOGRAPHS



Facing North along revetment.



Facing South along revetment.



Facing West to beach.



Facing Northwest showing revetment slope