16520 SW Upper Boones Ferry Road, Suite 100
Tigard, OR 97224
503-641-3478 | www.gri.com

MEMORANDUM

To: Garth Appanaitas, PE / DKS Associates

Date: April 29, 2024

GRI Project No.: 6897-A

From: Chris Ell, PE, GE; and Mike Marshall, CEG

Re: Preliminary Hazards Assessment
ODOT: OR 42-US 101 Passing Lanes Study
TM4: Geotechnical Tech Memorandum
Various Counties, Oregon

DRAFT

As requested, GRI completed a preliminary geological hazard assessment for the Oregon Department of Transportation (ODOT): OR 42 and US 101 Passing Lanes Study project located in southwestern Oregon. The project area focuses on two highways, including US 101 and OR 42, extending through various cities and unincorporated communities within Douglas, Coos, and Curry counties. US 101 is the primary north-south corridor along the Oregon coast, and OR 42 is a key east-west corridor, each providing access to a significant volume of tourism and freight traffic. The purpose of our study is to provide a preliminary geological assessment of the passing lane study areas to assist the project team with identifying areas that may be feasible for further studies and planning purposes. Our current scope of work and understanding of the project are based on our discussions with ODOT during a meeting on January 24, 2024. We understand our current goals are to perform a review of available geological information and previously mapped landslide hazards from the Oregon Department of Geology and Mineral Industries (DOGAMI), a review of the ODOT unstable slopes inventory database, a review of available Lidar imaging, and other previous geological hazard studies, if available, to assist the design team with identifying areas having a maximum cost-benefit ratio and lower mitigation or long-term maintenance costs, and to provide a memorandum summarizing our review of existing information and preliminary findings. This memorandum summarizes the work accomplished to date and provides a summary of the existing site conditions observed along the route study and our preliminary assessment of landslide hazards or other geological hazards along the proposed project study area.

PROJECT UNDERSTANDING

General

The Project will result in the development of a planning study that identifies high-level mitigation strategies and planning-level cost estimates for passing improvements and that prioritizes improvements with input from area stakeholders. The current project includes a preliminary assessment of potential new passing lanes along a total of 11 segments of US 101 and OR 42. The segments identified along US 101 extend from MP 198.59 north of Reedsport to MP 363.11 near

the Oregon/California border. The segments identified along OR 42 extend from MP 7.10 west of Coquille to MP 47.75 east of OR 542 Junction.

For discussion purposes, the project area is divided into segments along the roadway alignments for US 101 and OR 42, as described in the following Table 1.

Table 1. Project Segments

Segment #	Segment Name	Segment Mile Post	Segment Distance (mi)
101-A	Douglas County line to Reedsport	MP 198.59 – 211.07	12.48
101-B	Reedsport to Lakeside	MP 213.45-221.35	7.9
101-C	Lakeside to North Bend	MP 222.10-233.93	11.83
101-D	US101-OR42 Junction to Bandon	MP 245.00-260.63	15.63
101-E	Bandon to Port Orford	MP 276.71-298.32	21.61
101-F	Port Orford to Gold Beach	MP 303.30-326.21	22.91
101-G	Gold Beach to Brookings	MP 331.29-352.20	20.91
101-H	Brookings to CA Border	MP 361.52-363.11	1.59
42-A	West of Coquille	MP 7.10-9.38	2.28
42-B	Myrtle Point to OR 542 Junction	MP 22.09-23.44	1.35
42-C	OR 542 Junction to OR 42 Couplet	MP 23.72-47.75	24.03

GEOLOGIC SETTING

General

The study area is along the Pacific Coast of southwestern Oregon. The project alignment spans through a broad setting of geological and geographical environments located in river carved valley bottoms, traverses upon ridgelines, and runs along ocean terraces and sand dunes. Published mapping of the project area indicates the project elements are underlain by Jurassic and Cretaceous metamorphic mélange rocks, Cretaceous marine sedimentary rocks, Eocene sedimentary rocks, and Quaternary beach, river, terrace, and landslide deposits (OGDC-7, 2024). Franciscan mélange is a "block-in-matrix" unit, where weak matrix material such as mudstone or shale encloses stronger blocks of sandstone and metamorphic rocks (Wakabayashi, 2008). The following Table 2 provides a brief description of the mapped geological units located within each segment of the study area. The geological units relative to the proposed roadway segments within the study area are shown on Figures 2 through Figure 27.

Table 2. Mapped Geologic Units

Segment #	Segment Name	Mapped Geologic Units	FIGURES	Soil and Rock Description
101-A	Douglas County line to Reedsport	Qmt, mpt, fs, Tef	2,3	Marine terrace sandstone and siltstone, marsh and peat deposits
101-B	Reedsport to Lakeside	Qal, Tef, ss, Tec, Qmt	4	Alluvial sand, silt, and gravel, marine terrace sandstone and siltstone, Flournoy Formation, Coaledo Formation, stabilized sand dunes
101-C	Lakeside to North Bend	Qmt, Tec, mpt, tf	5,6	marine terrace sandstone and siltstone, Coaledo Formation, marsh and peat deposits, tidal flat silts
101-D	US101-OR42 Junction to Bandon	Qal, Tecm, Tecu, Qmt, Ter	7,8,9	Alluvial sand, silt, and gravel; marine terrace sandstone and siltstone; Roseburg Formation
101-E	Bandon to Port Orford	Qal, mpt, Qmt, Qmtm, Qft	10,11,12,13	Alluvial sand, silt, and gravel; marine terrace sandstone and siltstone; marsh and peat deposits; sand silts, gravels fluvial terrace
101-F	Port Orford to Gold Beach	Qmti, Hls. Krp, Khcg, Als, Aa, Kjo, Qmtp	14,15,16,17	marine terrace sandstone and siltstone; landslide deposits; Alluvial sand, silt, and gravel; Otter Point Formation; Humbug Mountain Conglomerate; Rocky Point Formation
101-G	Gold Beach to Brookings	Hls, Spu, Qls, Kuh, Kuc, Ads	18,19,20,21	Landslide deposits, sand dunes; beach and dune sands; Cape Sebastian Sandstone; Hunters Cove Formation; Dothan Formation; Otter Point Formation
101-H	Brookings to CA Border	Qus2, Jdo	22	Unconsolidated Quaternary sediments; Dothan Formation; Otter Point Formation
42-A	West of Coquille	Qal, mpt, Tecu, Qft	23	Alluvial sand, silt, and gravel; marine terrace sands; marsh and peat deposits
42-B	Myrtle Point to OR 542 Junction	Qal, Qt, Qft, Jop, Terv, Ter	24,25	Alluvial sand, silt, and gravel; marine and fluvial terrace sands; Otter Point Formation; Roseburg Formation
42-C	OR 542 Junction to OR 42 Couplet	Qal, Qls, Tmms, KJdm, Tm, Twbc, Twr, Twc	26,27	Alluvial sand, silt, and gravel; Landslide deposits; Dothan Formation, Tenmile Formation mudstone; White Tail Ridge Formation

GEOLOGIC HAZARD DATABASE REVIEW

Landslide Inventory Records

A review of available information, including mapped geologic hazards and landslide inventory database material, was performed along the project corridor. The available information reviewed was based on two primary sources, consisting of the Oregon DOGAMI Landside Inventory and Database and the ODOT Landslide Inventory Database, as described in further detail below. Other sources of limited information, including aerial photograph reviews and observation of remote sensing Lidar data in ArcGIS, were used for the development of hazard maps of the segments in the project area.

DOGAMI Landslide Database The Oregon DOGAMI, the state agency responsible for geologic hazard mapping, conducts an ongoing effort to collect and display landslide data for the State of Oregon. The landslides include deposits identified through geologic mapping, published geologic studies, and historical records of slope instability events. The Statewide Landslide Information Database for Oregon (SLIDO), developed by DOGAMI, is an online database that includes these maps for the entire state. The maps show areas of known landslides or areas with ground features indicative of landslide processes, termed "landslide topography." At the time of this report, the available SLIDO documentation indicates the project corridor is located in the vicinity of areas identified as being underlain by landslide deposits and landslide topography along several segments of the study area. Maps of the available information from SLIDO are shown relative to the segments within the project study area on Figures 28 through Figure 53.

ODOT Landslide Inventory Database The Oregon Department of Transportation maintains a landslide database of known landslides throughout the state of Oregon. The landslide data is categorized into levels of activity: low, moderate, and high, based on frequency of maintenance and annual slip rates of movement. The locations of the landslide data were incorporated into the geologic hazard maps prepared for the study area on Figures 28 through 53. The landslide data points are depicted in each of the above figures in various colors, including green (low hazard), yellow (moderate hazard), and red (high hazard).

PRELIMINARY GEOLOGIC HAZARD EVALUATION OF PASSING LANE STUDY AREAS

General

A review of available geologic hazard information for the project corridor was performed to help evaluate the feasibility of new passing lanes based on mapped hazards along each segment. A summary of the available data collected has been included on GIS mapping files in this memorandum as part of the preliminary study. As shown on the attached geologic hazard maps, sub-segments of the existing roadway alignment within the study area were categorized into general hazard levels based on proximity to known geologic hazards provided by the available database information. For preliminary planning purposes, we categorized the roadway sub-segments into three relative hazard levels: *low hazard, moderate hazard, and high hazard*. The

hazard levels are based on a relative scale that considers the lowest to highest hazard areas throughout the project area based on limited studies. A description of the low, moderate, and high hazard levels shown on the attached maps developed for preliminary planning purposes and the study area is described below.

Low Hazard (Green) The low-hazard-level areas shown in green on the attached GIS maps are portions of the project segments that were not observed to be located within close proximity of mapped hazards identified in the databases and have a generally lower likelihood of encountering shallow or deep-seated landslides, landside topography, rockfall, or other potential slope hazards. These areas were generally identified as having flat to moderately undulating topography and as areas where landslide deposits or historical slope failures had not previously been observed. Based on our preliminary studies, in our opinion, the low-hazard areas are likely associated with lower concern for encountering slope hazards, construction costs for slope mitigation, and long-term maintenance costs. We recommend additional studies be conducted in the identified low-hazard areas, such as ground-based studies, to confirm that no obvious or previously unidentified geological hazards are present in these areas and that such areas are feasible for further consideration of more detailed passing lane studies. The low-hazard segments shown on the attached maps currently include areas near established buildings and storefronts, portions of bridges, adjacent waterways, and other areas that may not be feasible due to factors such as high costs associated with roadway widening near such features. We anticipate refinements to the low-hazard areas relative to cost can be implemented on the attached maps in the final memorandum and/or future studies.

Moderate Hazard (Orange) The moderate-hazard-level areas shown in orange on the attached GIS maps are portions of the project segments that were observed to be located within close proximity of mapped hazards identified in the databases. The moderate hazard level generally includes areas that have a low density of slope hazards, such as shallow or deep-seated landslides, landside topography, rockfall, or other potential slope hazards, and low to moderate activity levels for slope hazards identified in the ODOT Landslide Inventory Database. These areas were generally identified as having steep topography, or where the alignment extends through sharp transitions in irregular topography that may be suspect to slope hazards, and areas where significant cuts or fills would be required to widen the roadway. Based on our preliminary studies, in our opinion, the moderate-hazard areas are not likely feasible for passing lanes and are likely associated with significant concern for encountering slope hazards, high construction costs for slope mitigation, and significant long-term maintenance costs. Due to the scale of the limited study, it is possible that segments of the moderate-hazard areas could contain low-hazard areas following more detailed studies. On the contrary, areas identified as moderate hazards could be high hazards following the results of additional studies. We recommend additional studies be conducted in the identified moderate-hazard areas, such as ground-based studies, to help confirm our preliminary

assumptions and identify potential low-hazard areas that could be feasible for further consideration of more detailed passing lane studies.

High Hazard (Red) The high-hazard-level areas shown on the attached GIS maps in red are portions of the project segments that were observed to be located within very close proximity to mapped hazards and frequently impacted by relatively high levels of maintenance or active landslide movement as identified in the databases. High-hazard areas are characterized by close proximity to or high density of shallow or deep-seated landslides, landside topography, rockfall, or other potential slope hazards. High hazard zones represent areas of the project where passing lanes are not considered feasible based on the information available in this current limited study and would likely include extraordinary construction costs for lane widening, landslide mitigation, and long-term maintenance costs.

RECOMMENDED SEGMENT LOCATIONS FOR FURTHER STUDIES

General

Based on the results of our preliminary information review and the GIS maps prepared for the study area, the identified low-hazard areas are recommended for additional studies as part of a future planning study. The following Table 3 identifies locations of low-slope hazard areas recommended for further consideration for potential passing lane areas. The limits of the low-hazard areas are designated by milepoints; however, due to the scale of the study, such limits should be considered approximate. The slope hazards and site hazard categorization could differ significantly from actual conditions in the field. We recommend additional ground studies be conducted in the field to confirm the slope hazard assumptions provided in the table below.

TABLE 3. Low Hazard Sub-Segments Considered for Further Studies

Segment #	Segment Name	Low Hazard Sub-Segment Mile Post	Segment Distance (mi)
101-A	Douglas County line to Reedsport	MP 198.59 - 199.14	0.93
		MP 199.75 - 200.71	1.19
		MP 202.47 - 204.03	1.56
		MP 208.67 - 209.86	0.96
		MP 210.15 - 211.08	0.58
101-B	Reedsport to Lakeside	MP 213.60 - 215.99	2.39
		MP 216.83 - 217.18	0.35
		MP 217.69 - 218.12	0.43
		MP 218.91 - 219.53	0.62
		MP 220.61 - 221.35.	0.74
101-C	Lakeside to North Bend	MP 222.08 - 229.14	7.06
		MP 229.28 - 229.61	0.33
		MP 229.7 - 229.84	0.14

Segment #	Segment Name	Low Hazard Sub-Segment Mile Post	Segment Distance (mi)
		MP 229.96 - 230.17	0.21
		MP 230.28 - 233.19	2.91
		MP 233.47 - 233.92	0.45
101-D	US101-OR42 Junction to Bandon	MP 246.37 - 247.85	1.48
		MP 249.51 - 250.87	1.36
		MP 251.73 - 252.69	0.96
		MP 253.35 - 254.86	1.51
		MP 255.78 - 260.61	4.83
101-E	Bandon to Port Orford	MP 276.72 - 288.69,	11.97
		MP 288.84 - 290.32,	1.48
		MP 290.51 - 291.15,	0.64
		MP 291.37 - 291.98,	0.61
		MP 292.33 - 295.77.	3.44
		MP 296.14 - 298.32.	2.18
101-F	Port Orford to Gold Beach	MP 307.71 -308.13,	0.42
		MP 308.25 - 308.48,	0.23
		MP 309.27 - 309.8,	0.53
		MP 312.84 - 313.81,	0.97
		MP 316.77 - 320.38.	3.61
		MP 321.47 - 323.78.	2.31
		MP 326.07 - 326.21.	0.14
101-G	Gold Beach to Brookings	MP 337.87 - 338.26	0.39
		MP 339.06 - 341.97	2.91
		MP 349.56 - 350.32	0.76
		MP 352.01 - 352.20	0.19
101-H	Brookings to CA Border	MP 361.52-363.11	1.59
42-A	West of Coquille	MP 7.71 - 7.99	0.25
		MP 8.59 - 8.82	0.23
42-B	Myrtle Point to OR 542 Junction	None	
42-C	OR 542 Junction to OR 42 Couplet	MP 28.86 - 29.19	0.33
		MP 30.01 - 30.98	0.97
		MP 31.24 - 31.81	0.57
		MP 37.30 - 38.62	1.32

LIMITATIONS

This memorandum has been prepared to aid DKS and ODOT in their understanding of existing site conditions and preliminary assessment of the landslide hazards along the proposed segments within the Project alignment. The scope is limited to the specific locations and evaluation methods described within this memorandum. The findings and preliminary recommendations submitted in this memorandum are based on the limited data obtained from the literature review, digital image analysis and interpretation, and other sources of information discussed herein. Areas identified with hazard levels are based on the information available at the time the work was completed. The information provided in this memorandum is preliminary and will be reviewed and re-evaluated as additional site access, project information, and data become available. Information, including interpreted geological conditions, provided in this memorandum is based in part on information provided by others and may be limited by the data available at the time of this report. Site reconnaissance was not part of the current scope of work. The information provided in this memorandum, including areas that may be shown as potentially feasible relative to geologic hazards, should be evaluated with ground-based reconnaissance studies. The feasibility of low-hazard sites should also be evaluated relative to other environmental and cost-related factors by other members of the agency and design team during subsequent planning studies.

We have included the Geoprofessional Business Association (GBA) guidance document "Important Information about This Geotechnical-Engineering Report/Geoenvironmental Report" to assist you and others in understanding the use and limitations of this memorandum, included as Appendix A. We recommend you read this document.

Please contact the undersigned if you have any questions.

Submitted for GRI,

Christopher K. Ell, P.E, G.E.
Principal

Mike Marshall, C.E.G.
Senior Geologist

This document has been submitted electronically.

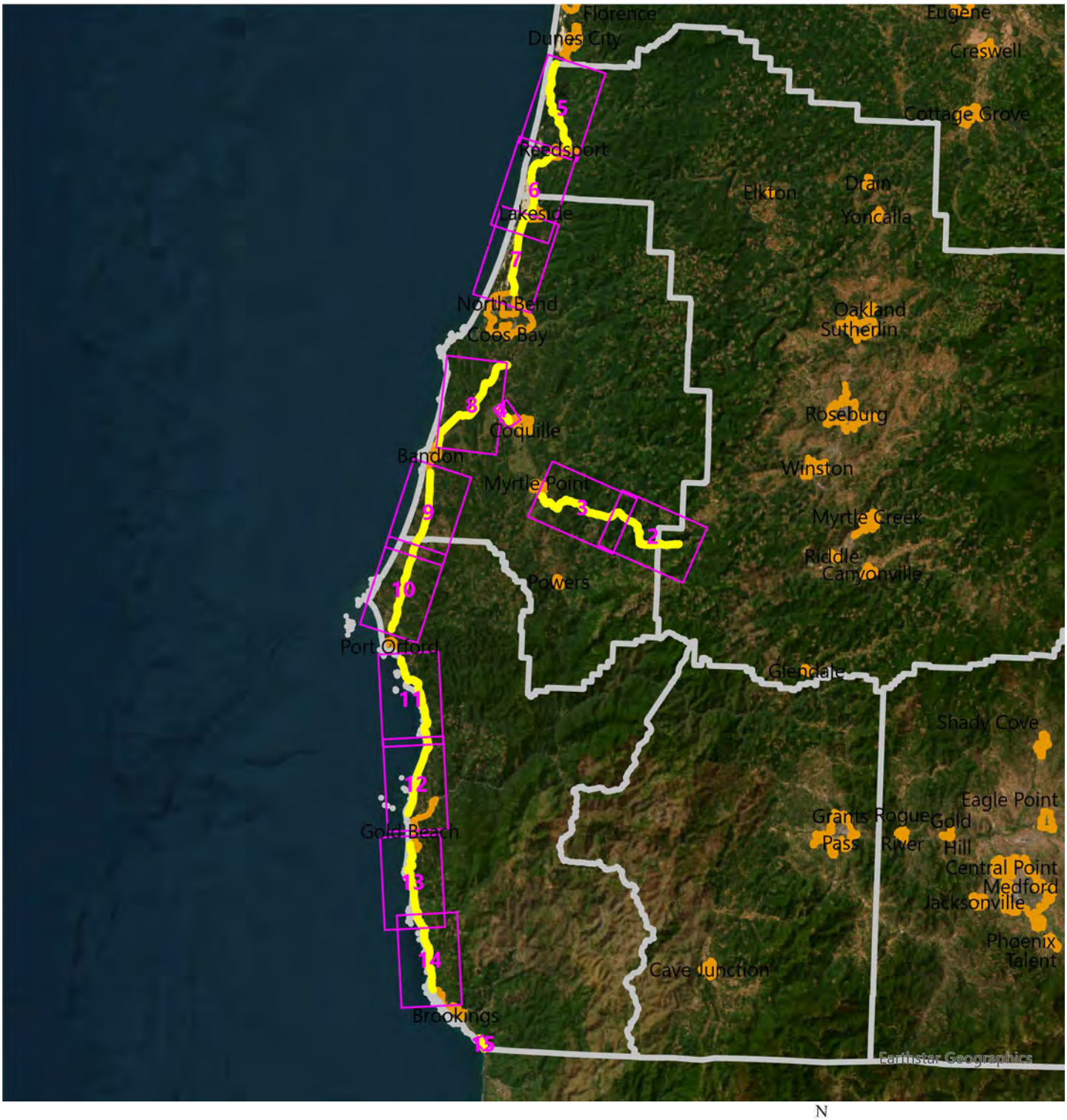
6897-A – ODOT GEOTECHNICAL MEMORANDUM

Enclosure: Figures 1, Vicinity Map
Figures 2 through 27, Geologic Maps,
Figure 28 through 53, Interpretive Hazard Maps

REFERENCES

Oregon Geologic Data Compilation, release 7 (OGDC-7), 2024, compiled by Jon J. Franczyk, Ian P. Madin, Carlie J.M. Duda, and Jason D. McClaughry. Accessed 04/23/24.

Wakabayashi, J., 2008, Franciscan Complex, California: problems in recognition of mélanges, and the gap between research knowledge and professional practice, ARMA Paper 08-357.



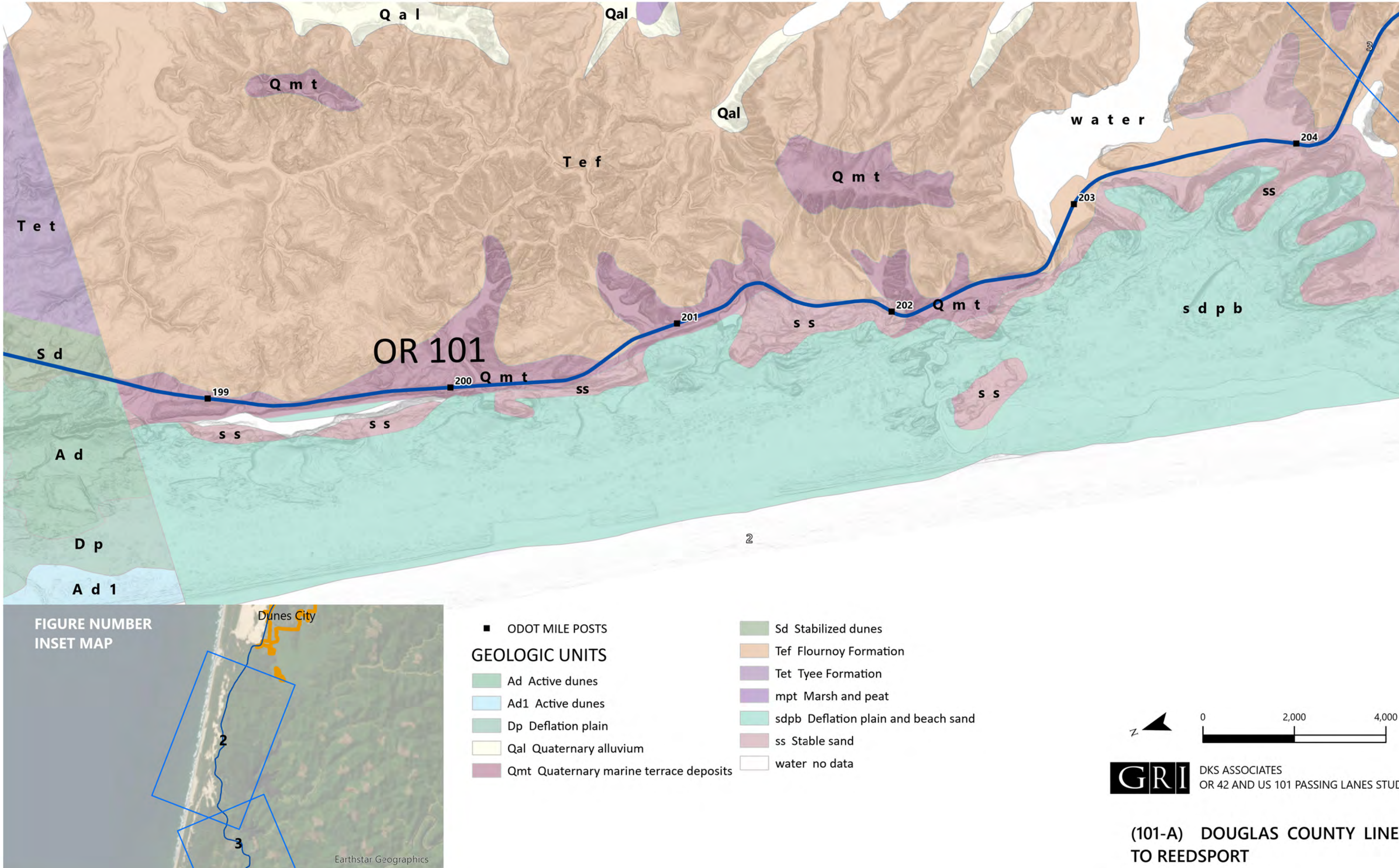
N

0 10 20 Miles

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

VICINITY MAP

APR. 2024 JOB NO. 6897-A FIG. 1



■ ODOT MILE POSTS

GEOLOGIC UNITS

- Ad Active dunes
- Ad1 Active dunes
- Dp Deflation plain
- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Sd Stabilized dunes
- Tef Flournoy Formation
- Tet Tyee Formation
- mpt Marsh and peat
- sdpb Deflation plain and beach sand
- ss Stable sand
- water no data

N

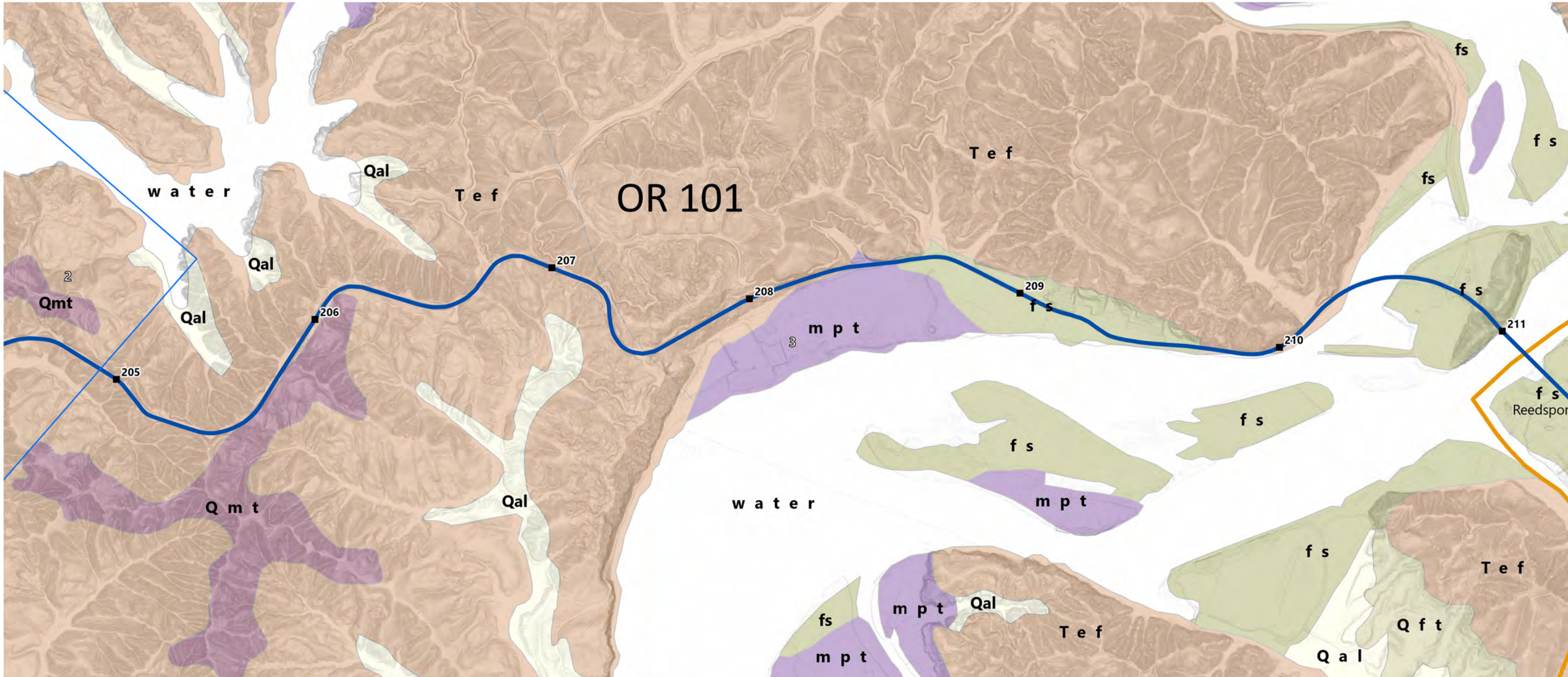
0 2,000 4,000 FT

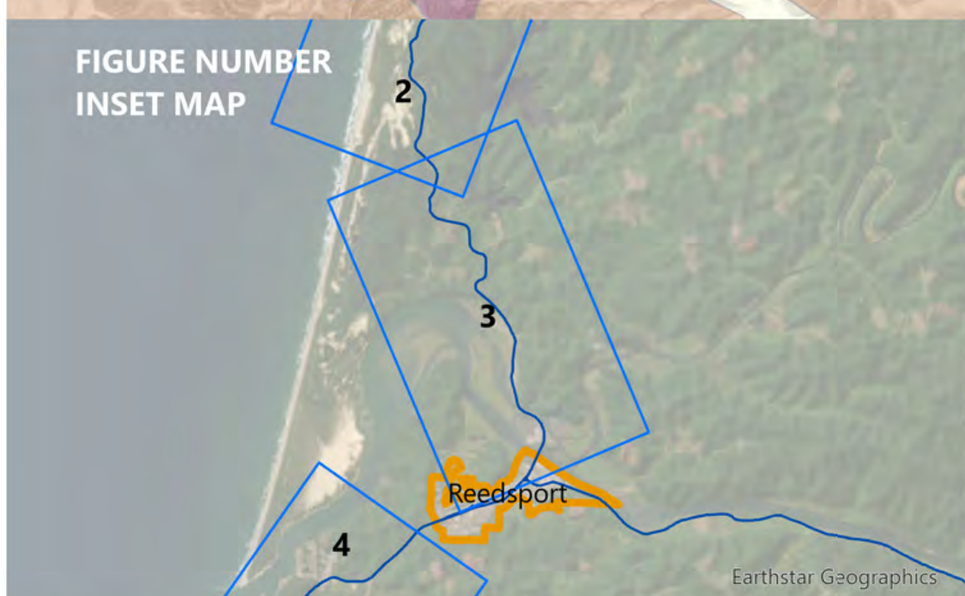
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-A) DOUGLAS COUNTY LINE TO REEDSPORT

APR. 2024 JOB NO. 6897-A FIG. 2





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qft Quaternary fluvial terrace deposits
- Qmt Quaternary marine terrace deposits
- Tef Flournoy Formation
- fs Fill and spoils
- mpt Marsh and peat
- water no data

N

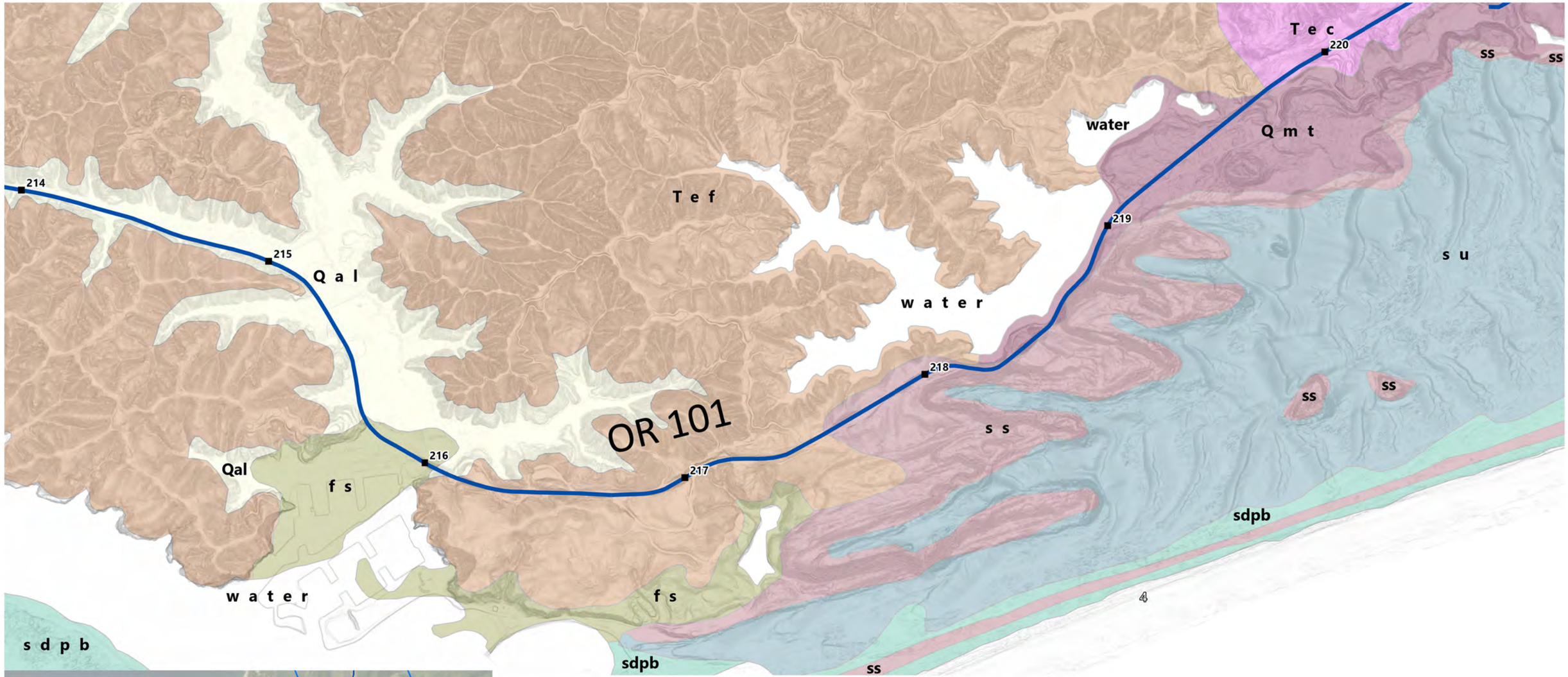
0 2,000 4,000 FT

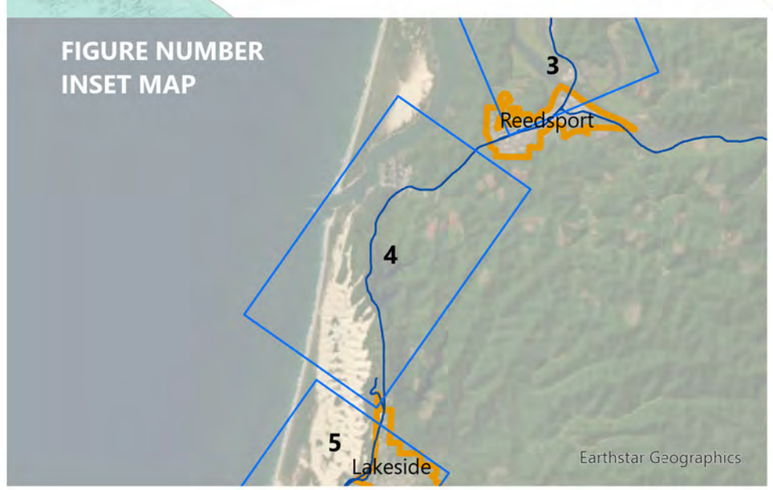
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-A) DOUGLAS COUNTY LINE TO REEDSPORT

APR. 2024 JOB NO. 6897-A FIG. 3





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Tec Coaledo Formation
- Tef Flournoy Formation
- fs Fill and spoils
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand
- water no data

N

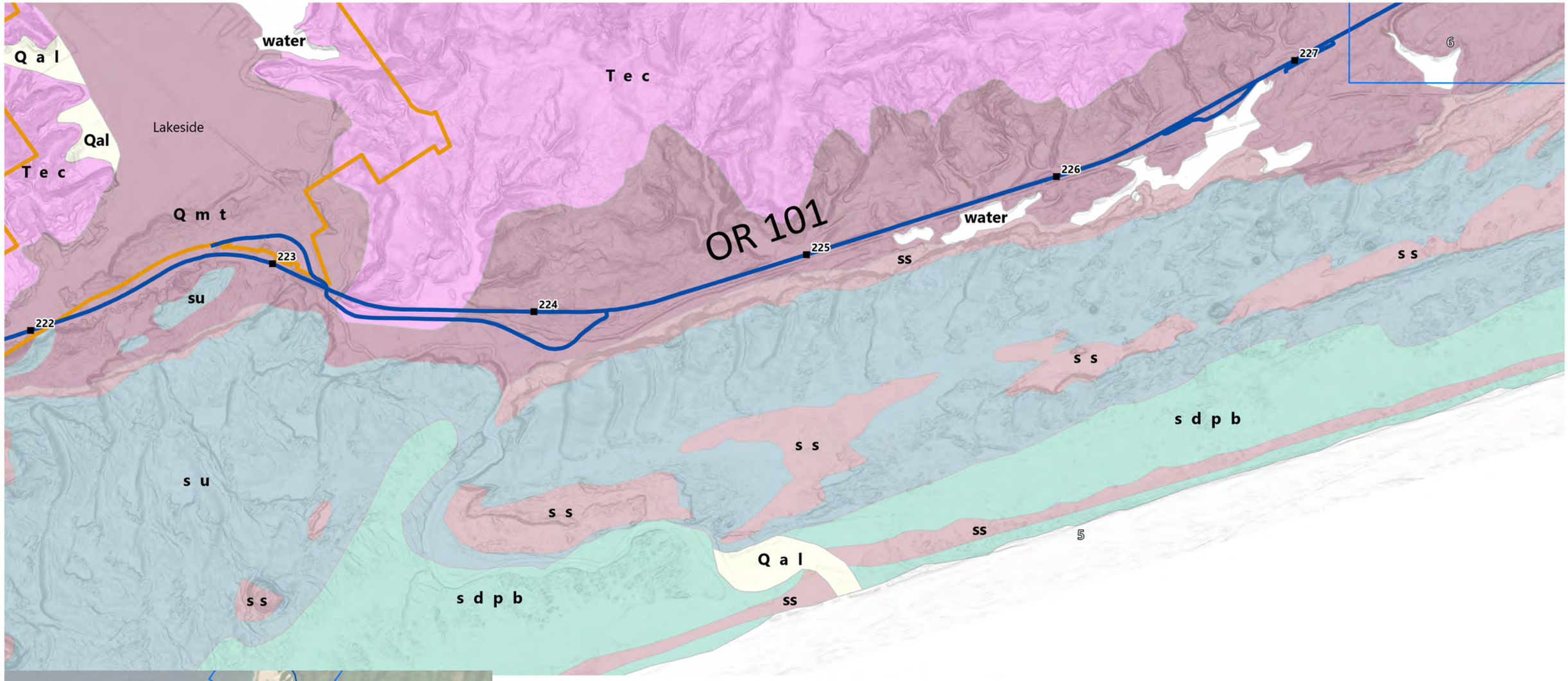
0 2,000 4,000 FT

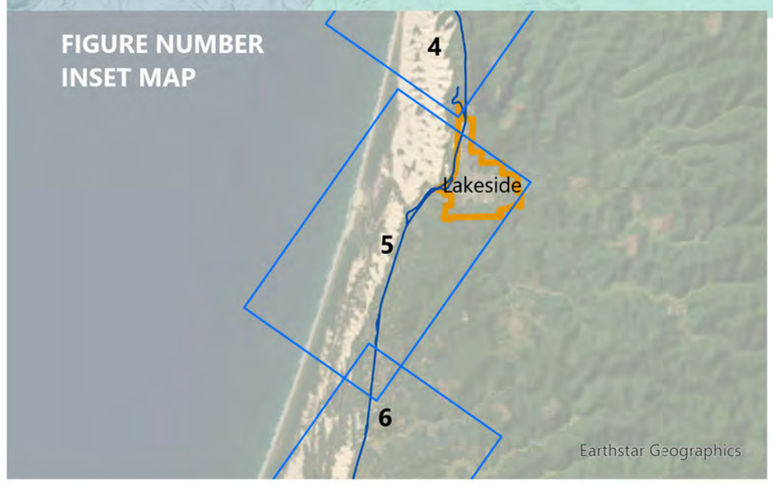
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-B) REEDSPORT TO LAKESIDE

APR. 2024 JOB NO. 6897-A FIG. 4





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Tec Coaledo Formation
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand
- water no data

N

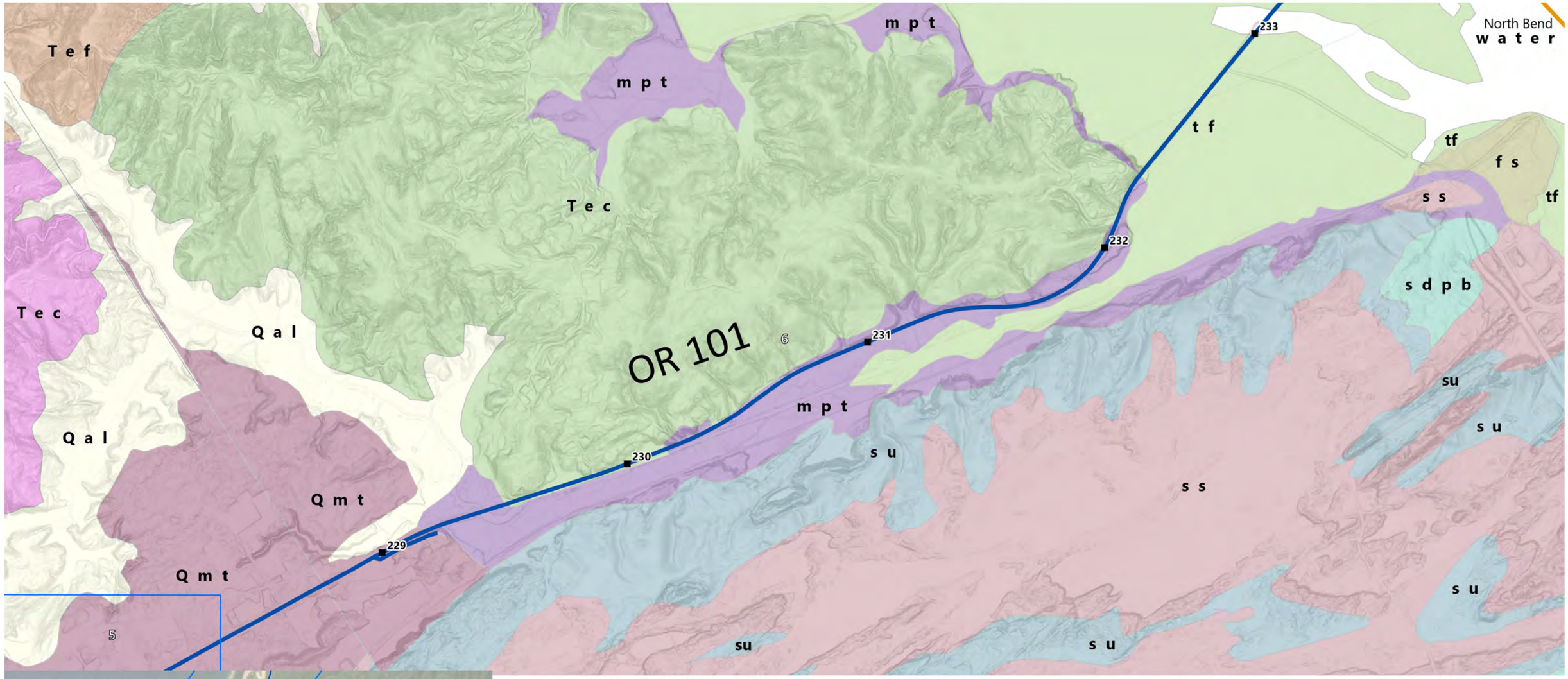
0 2,000 4,000 FT

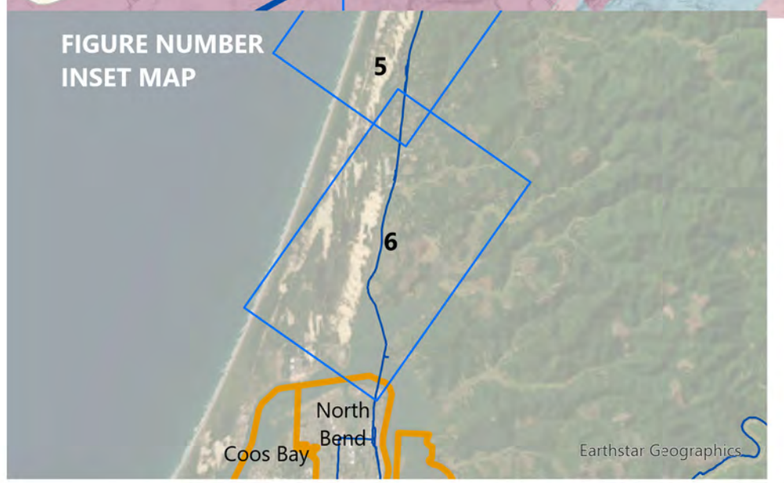
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-C) LAKESIDE TO NORTH BEND

APR. 2024 JOB NO. 6897-A FIG. 5





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Tc Coaledo Formation
- Tec Coaledo Formation
- Tec Coaledo Formation, undifferentiated
- Tef Flournoy Formation
- fs Fill and spoils
- mpt Marsh and peat
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand
- tf Tidal flat
- water no data

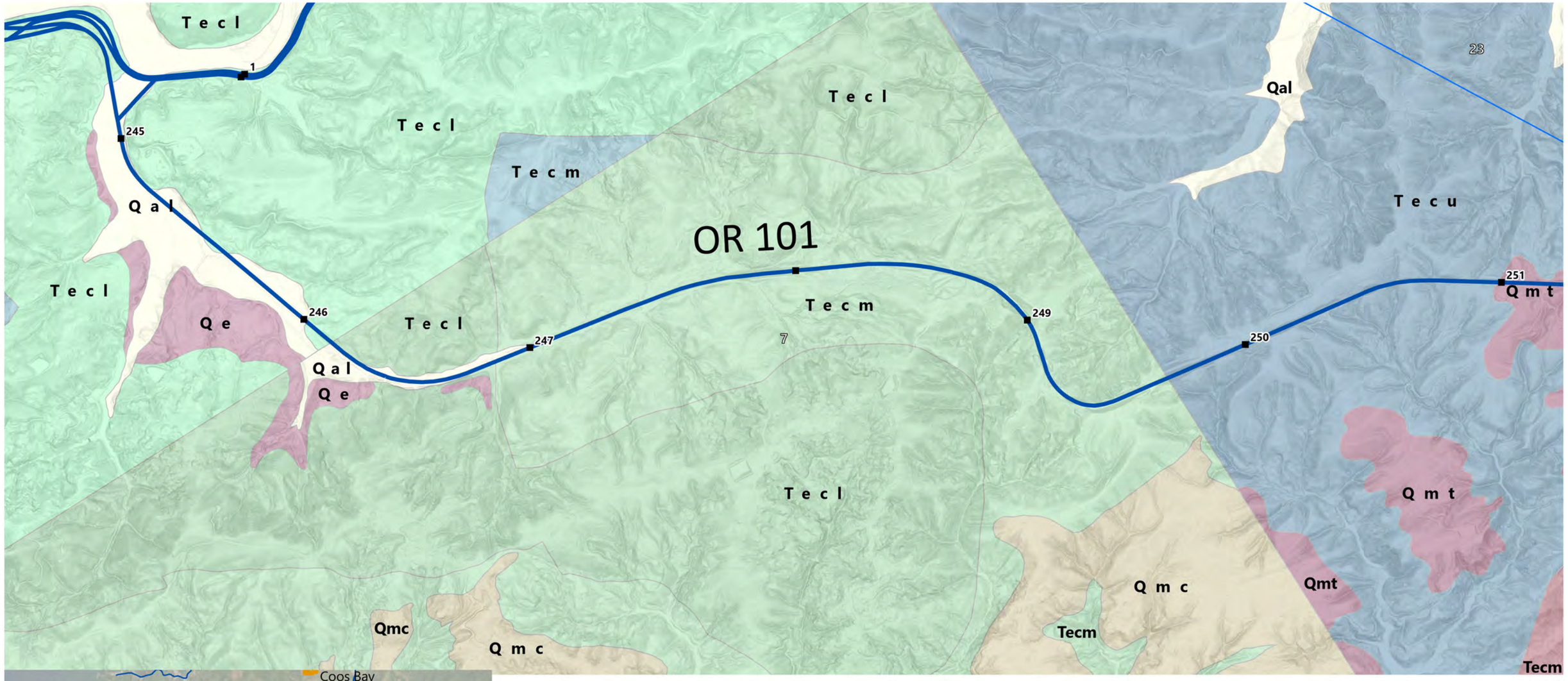
N

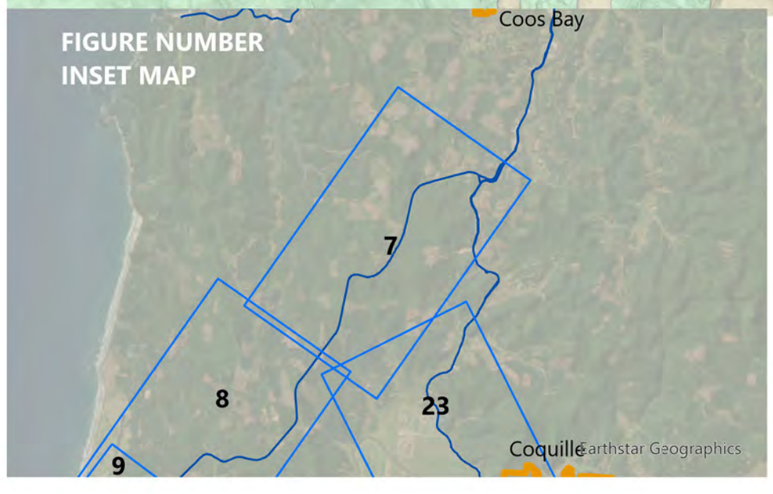
0 2,000 4,000 FT

GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-C) LAKESIDE TO NORTH BEND

APR. 2024 JOB NO. 6897-A FIG. 6





- ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qal Quaternary alluvium and estuarine sediments
- Qe Quaternary estuarine deposits
- Qmc Metcalf marine terrace
- Qmt Quaternary marine terrace deposits
- Tecl Coaledo Formation, Lower Member
- Tecl Coaledo Formation, lower member
- Tecl Lower member of the Coaledo Formation
- Tecm Coaledo Formation, Middle Member
- Tecm Coaledo Formation, middle member
- Tecm Middle member of the Coaledo Formation
- Tecu Coaledo Formation, upper member

N

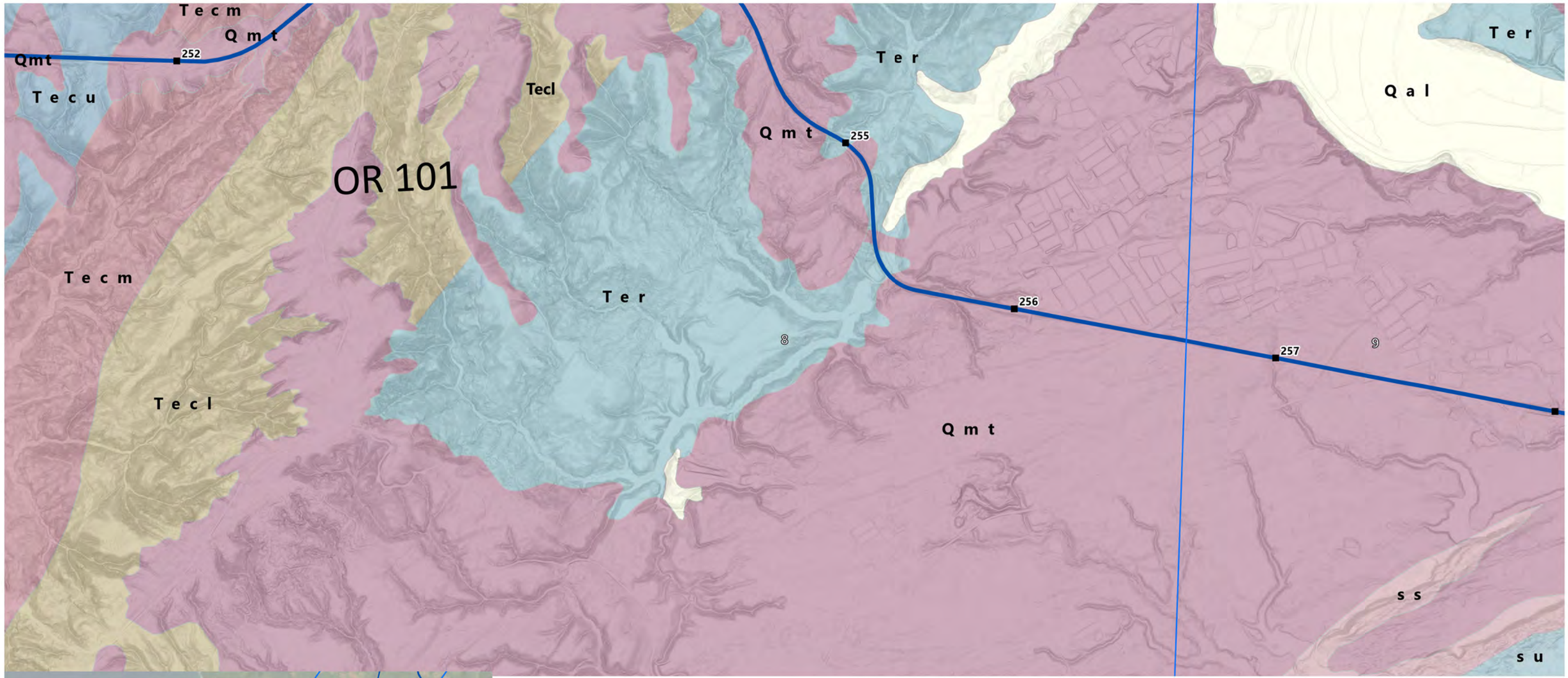
0 2,000 4,000 FT

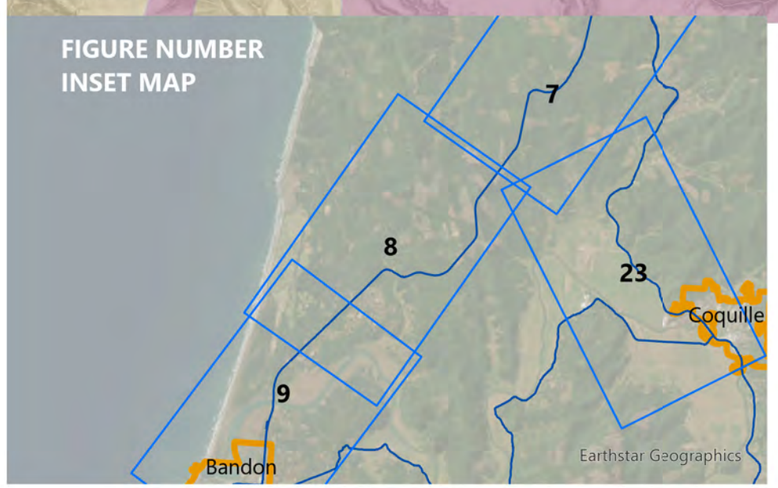
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 7





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Tecl Coaledo Formation, lower member
- Tecm Coaledo Formation, middle member
- Tecu Coaledo Formation, upper member
- Ter Roseburg Formation
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand

N

0 2,000 4,000 FT

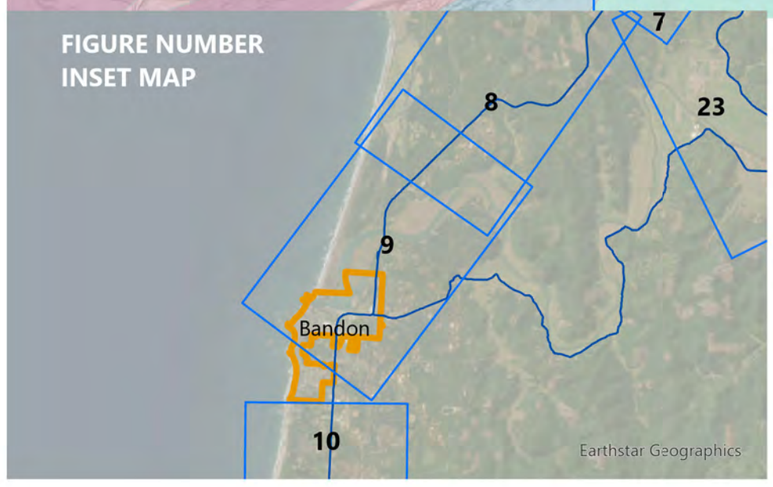
GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 8

Ter
Qal
Qmt
mpt
fs
ss
su
sdpb
OR 101
257
258
259
260
261
274
275
Bandon
8
9

FIGURE NUMBER
INSET MAP



■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jov Otter Point Formation, volcanic rock
- Qal Quaternary alluvium
- Qmt Quaternary marine terrace deposits
- Ter Roseburg Formation
- fs Fill and spoils
- mpt Marsh and peat
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand
- water no data

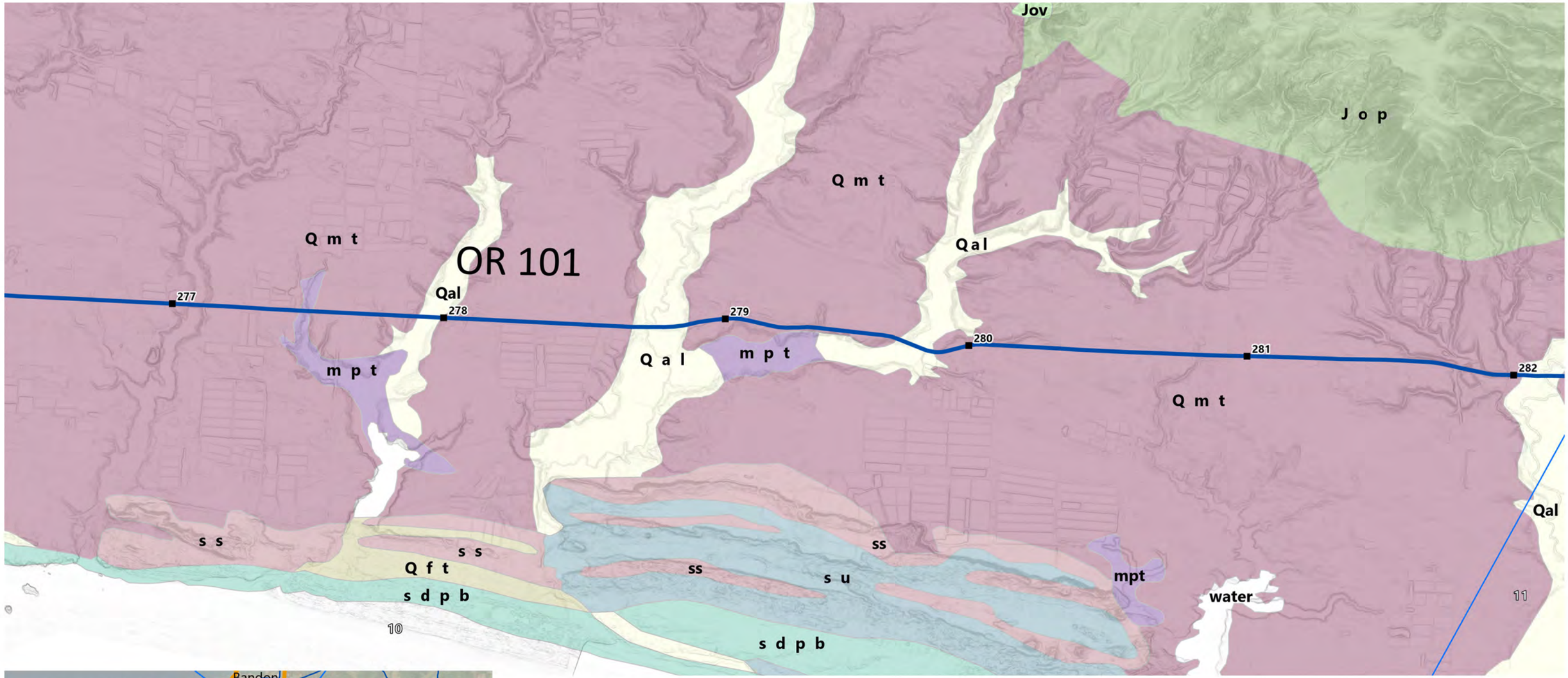
N

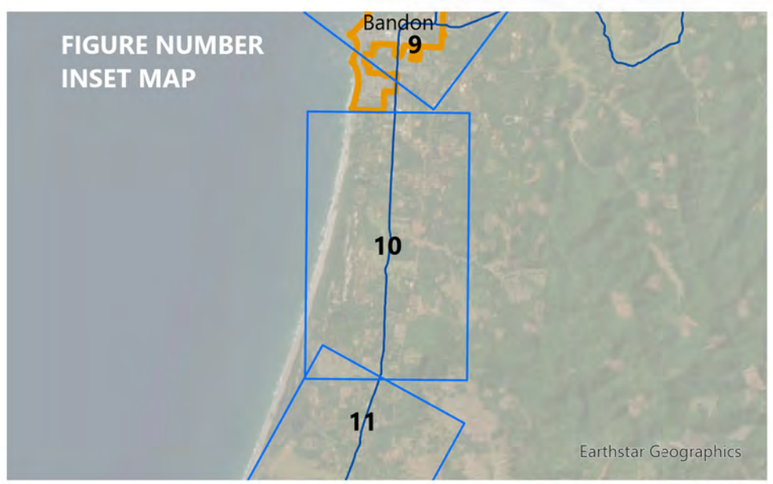
0 2,000 4,000 FT

GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 9





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jop Otter Point Formation, sedimentary rock
- Jov Otter Point Formation, volcanic rock
- Qal Quaternary alluvium
- Qft Quaternary fluvial terrace deposits
- Qmt Quaternary marine terrace deposits
- mpt Marsh and peat
- sdpb Deflation plain and beach sand
- ss Stable sand
- su Unstable dune sand
- water no data

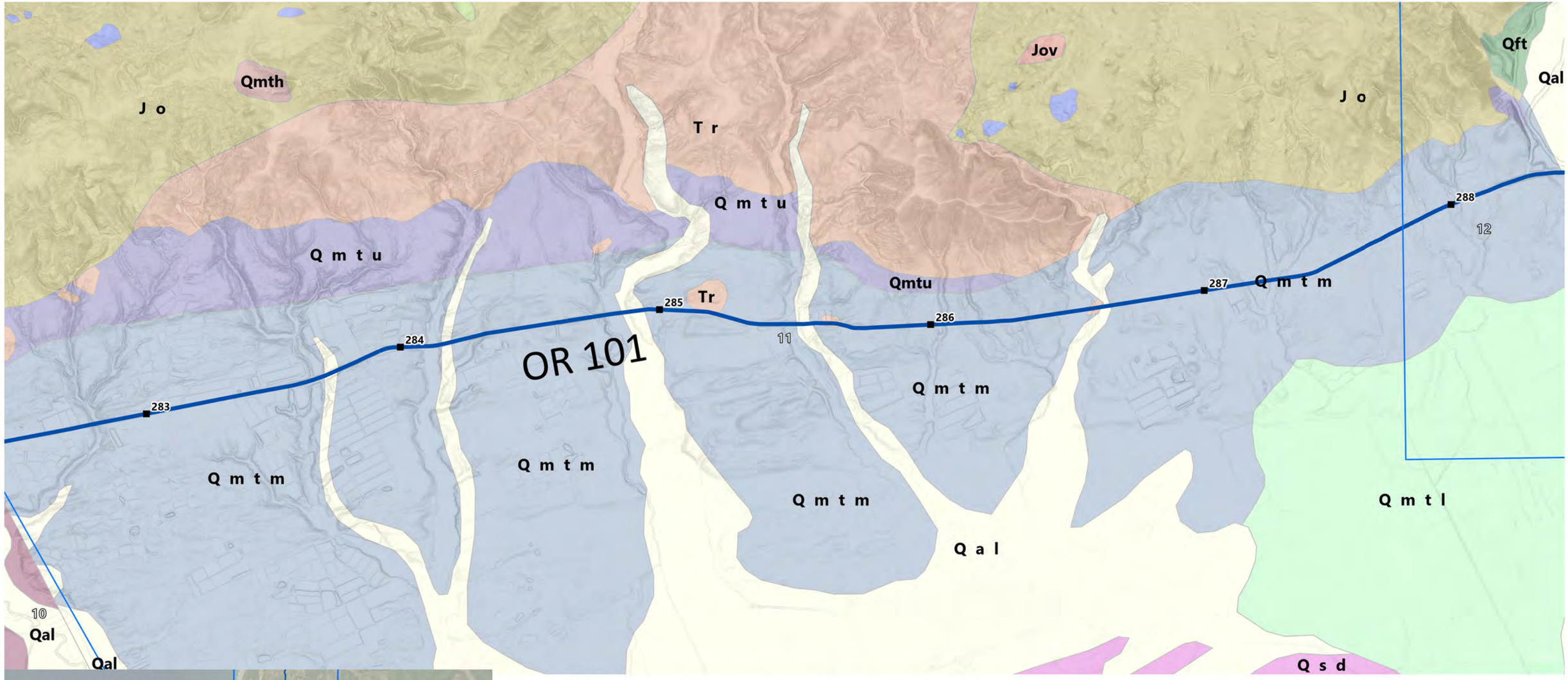
N

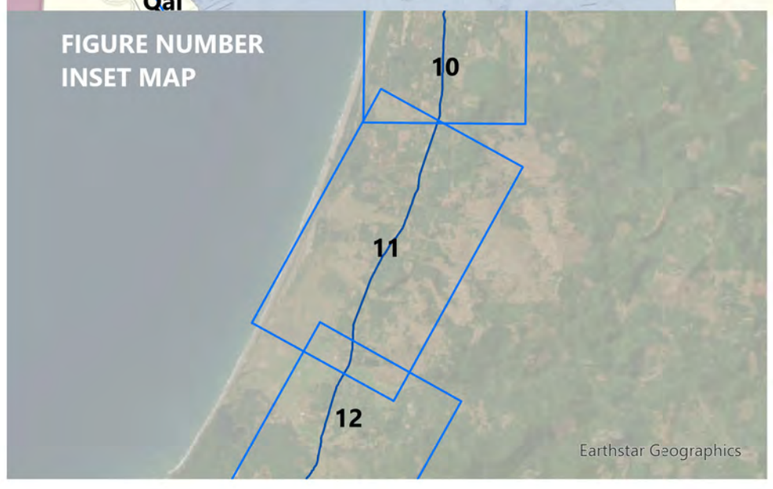
0 2,000 4,000 FT

GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 10





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jo Otter Point Formation
- Jov Otter Point Formation volcanic rocks
- Jsh Glaucophane schist and related rocks
- Jur Ultramafic rocks
- Qal Alluvium
- Qal Quaternary alluvium
- Qft Fluvial terrace deposits
- Qmt Quaternary marine terrace deposits
- Qmth Higher marine terrace deposits
- Qmtl Lower marine terrace deposits
- Qmtm Middle marine terrace deposits
- Qmtu Upper marine terrace deposits
- Qsd Stable dune deposits
- Tr Roseburg Formation

N

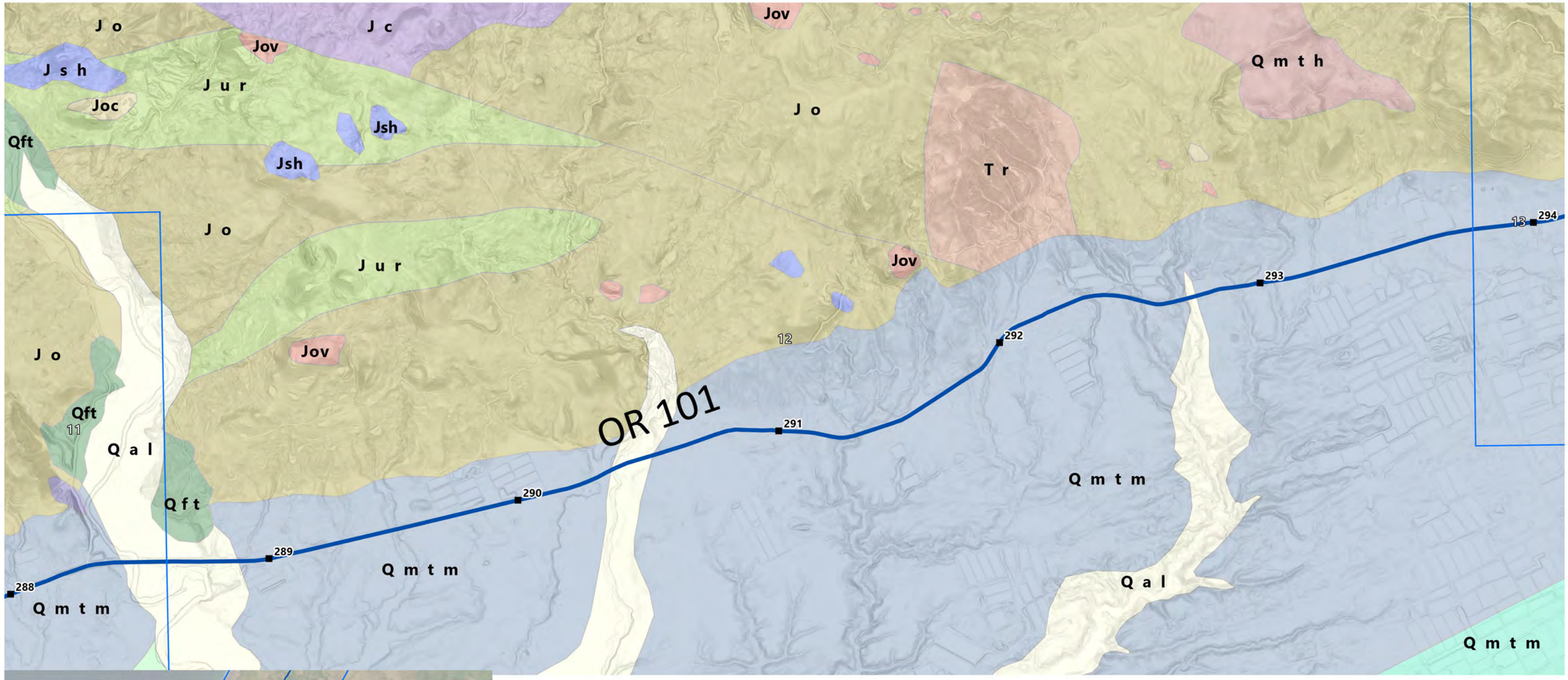
0 2,000 4,000 FT

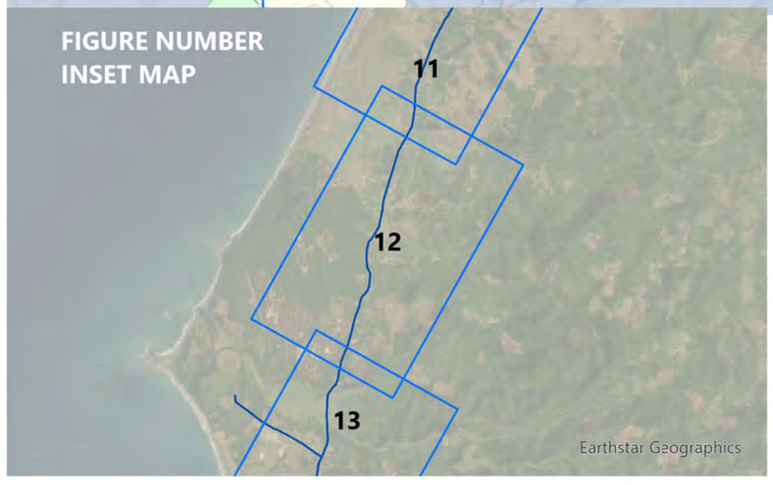
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 11





- ODOT MILE POSTS

GEOLOGIC UNITS

- Jc Colebrooke Schist
- Jo Otter Point Formation
- Joc Otter Point Formation chert
- Jov Otter Point Formation volcanic rocks
- Jsh Glaucophane schist and related rocks
- Jur Ultramafic rocks
- Qal Alluvium
- Qft Fluvial terrace deposits
- Qmth Higher marine terrace deposits
- Qmtl Lower marine terrace deposits
- Qmtm Middle marine terrace deposits
- Qmtm Quaternary middle marine terrace deposits
- Qmtu Upper marine terrace deposits
- Tr Roseburg Formation

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 12

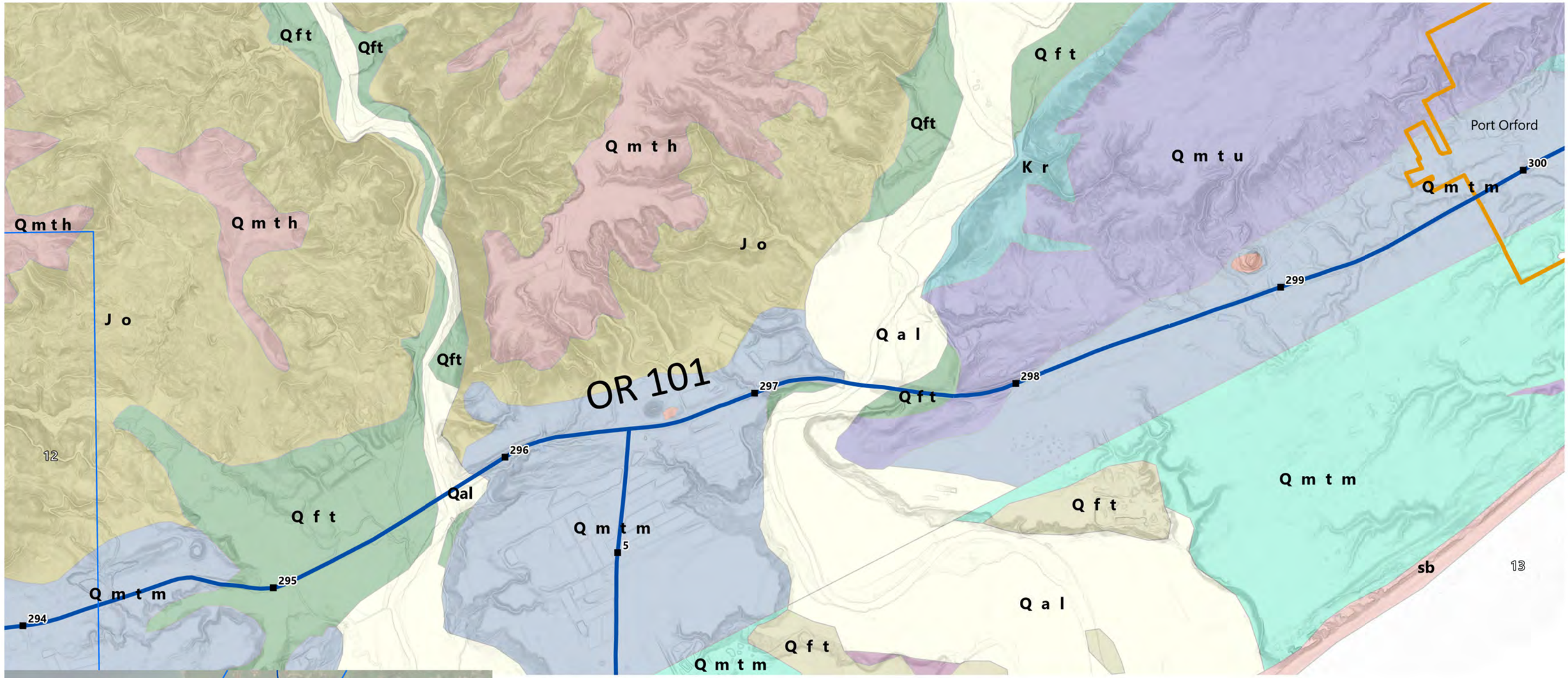


FIGURE NUMBER
INSET MAP

■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jo Otter Point Formation
- Jop Otter Point Formation
- Jov Otter Point Formation volcanic rocks
- Kr Rocky Point Formation
- Qal Alluvium
- Qal Quaternary Alluvium
- Qft Fluvial terrace deposits
- Qft Quaternary fluvial terrace deposits
- Qmth Higher marine terrace deposits
- Qmtm Middle marine terrace deposits
- Qmtm Quaternary middle marine terrace deposits
- Qmtu Upper marine terrace deposits
- m Marsh deposits
- sb Beach sand
- water no data

N

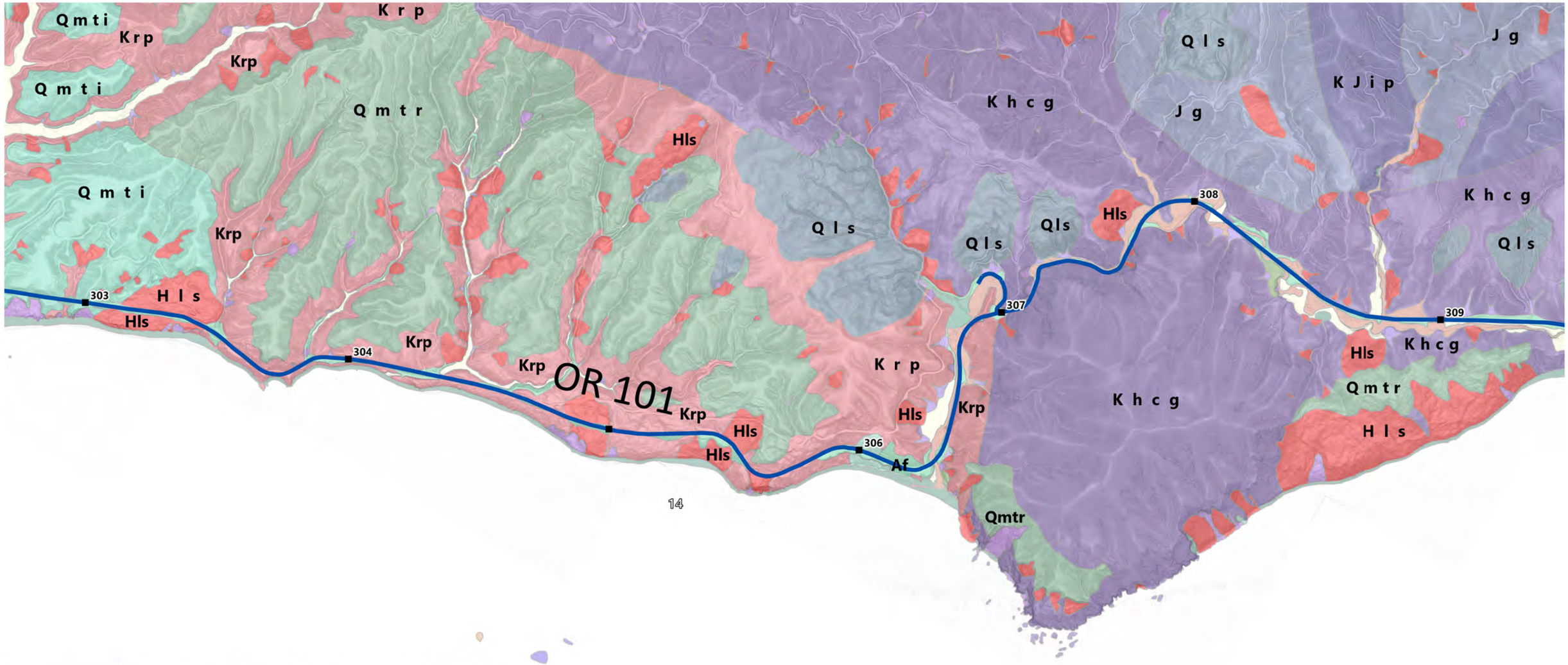
0 2,000 4,000 FT

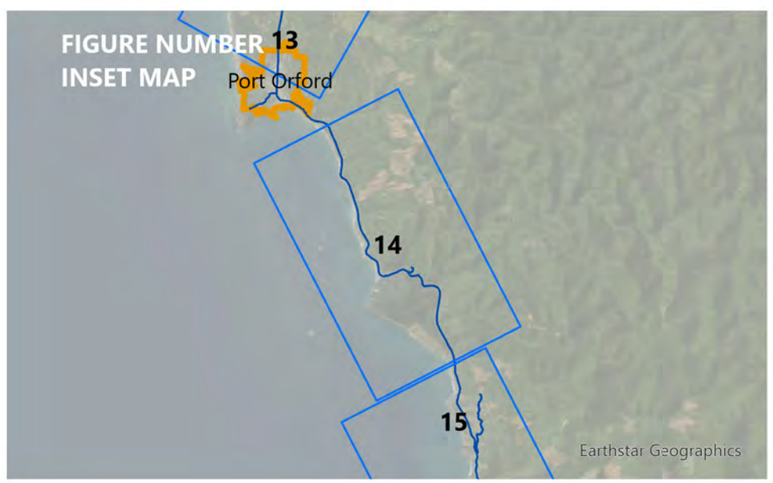
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 13





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Haf Alluvial fan deposits
- Hdf Debris fan deposits
- Hls Landslide deposits
- Hrf Rock fall and colluvium
- Jg Galice Formation
- KJip Pearse Peak Diorite
- KJo Otter Point Formation, undivided
- KJov Otter Point Formation, Volcanic rocks
- Khcg Humbug Mountain Conglomerate
- Krp Rocky Point Formation
- Qa Alluvium
- Qdf Debris fan deposits
- Qls Landslide deposits
- Qmti Indian Creek terrace sediments

N

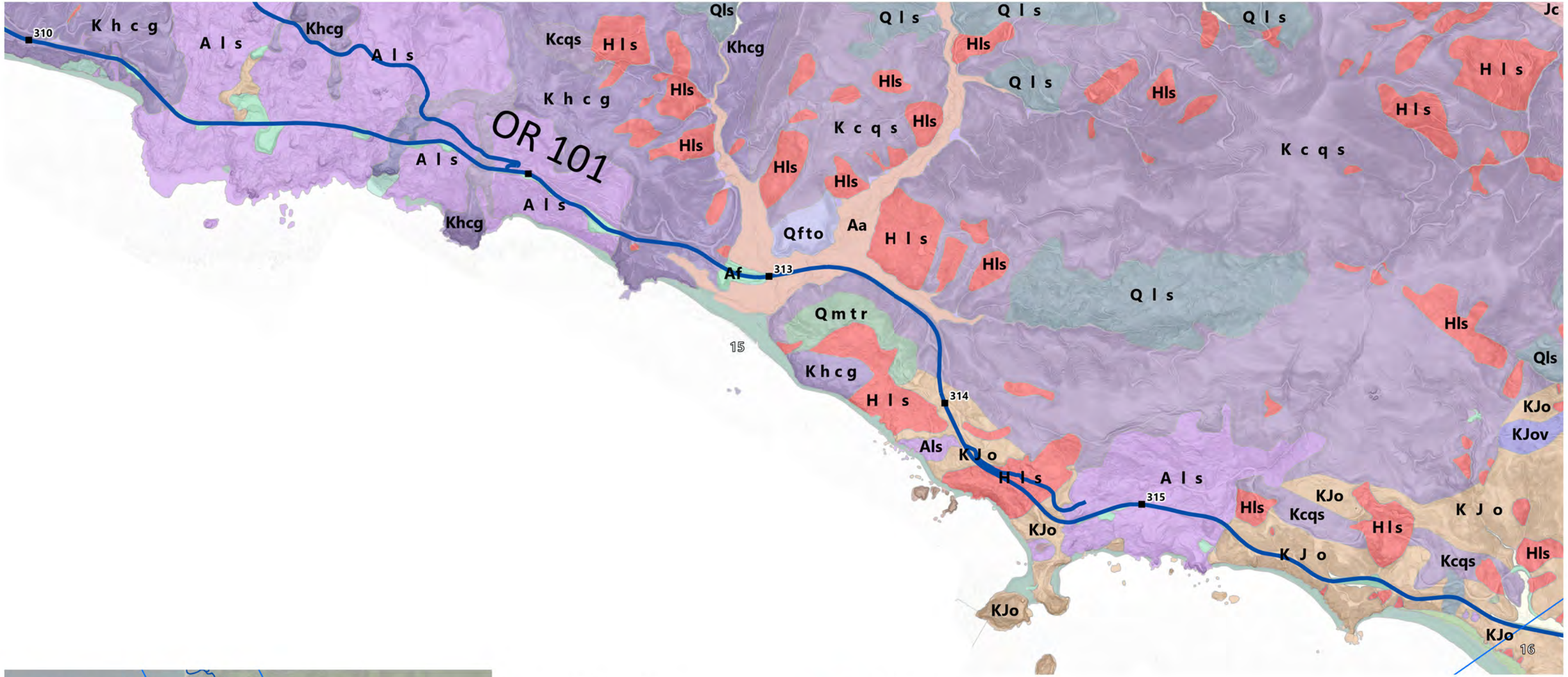
0 2,000 4,000 FT

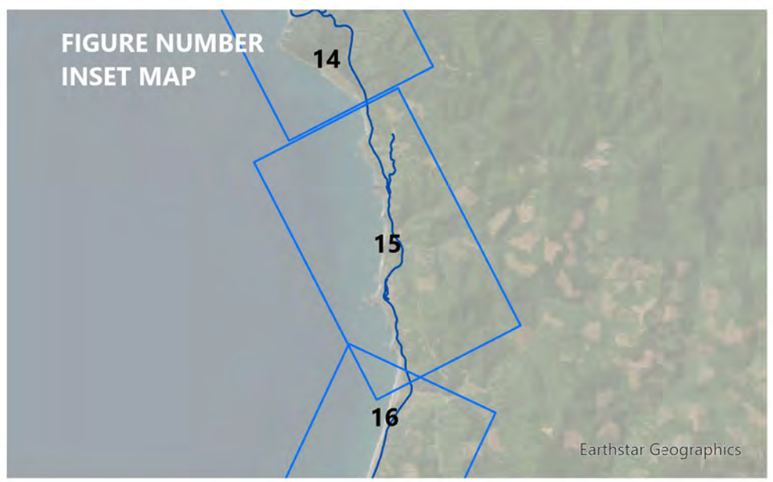
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 14





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Hdf Debris fan deposits
- Hls Landslide deposits
- Hrf Rock fall and colluvium
- Jc Colebrooke schist
- KJid Diorite
- KJip Pearse Peak Diorite
- KJo Otter Point Formation, undivided
- KJoc Otter Point Formation, Chert
- KJos Otter Point Formation, sandstone
- KJov Otter Point Formation, Volcanic rocks
- Kcqs Colebrooke Schist
- Khcg Humbug Mountain Conglomerate
- Qfto Older fluvial terrace deposits
- Qls Landslide deposits

N

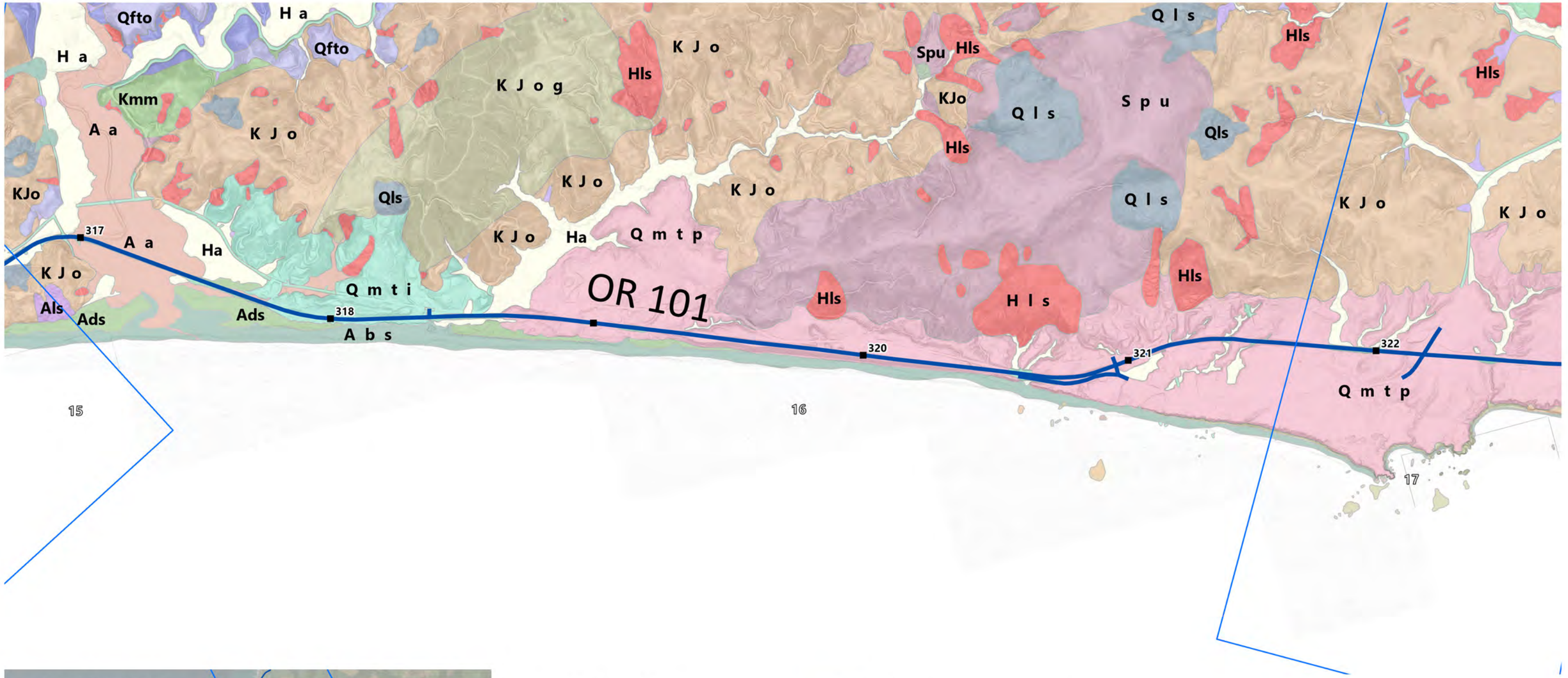
0 2,000 4,000 FT

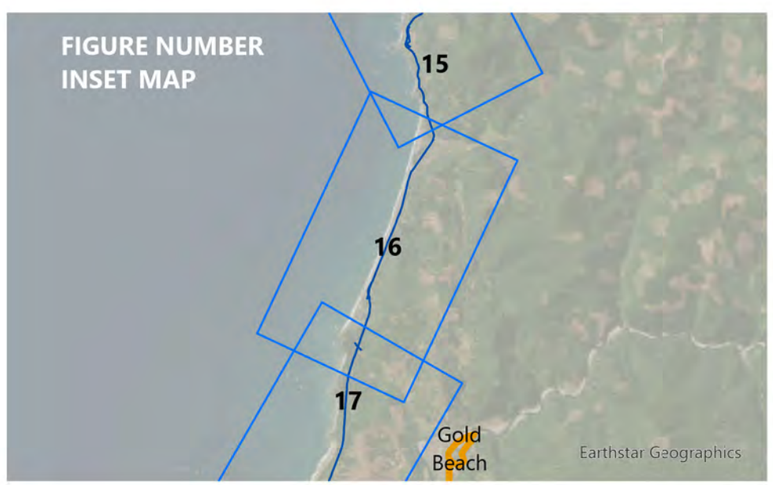
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 15





- ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Haf Alluvial fan deposits
- Hdf Debris fan deposits
- Hls Landslide deposits
- KJid Diorite
- KJo Otter Point Formation, undivided
- KJoc Otter Point Formation, Chert
- KJog Otter Point Formation, Clast-supported conglomerate
- KJos Otter Point Formation, sandstone
- Kmcg Conglomerate
- Kmm Mudstone
- Qfto Older fluvial terrace deposits
- Qls Landslide deposits
- Qmti Indian Creek terrace sediments
- Qmtp Pioneer terrace sediments

N

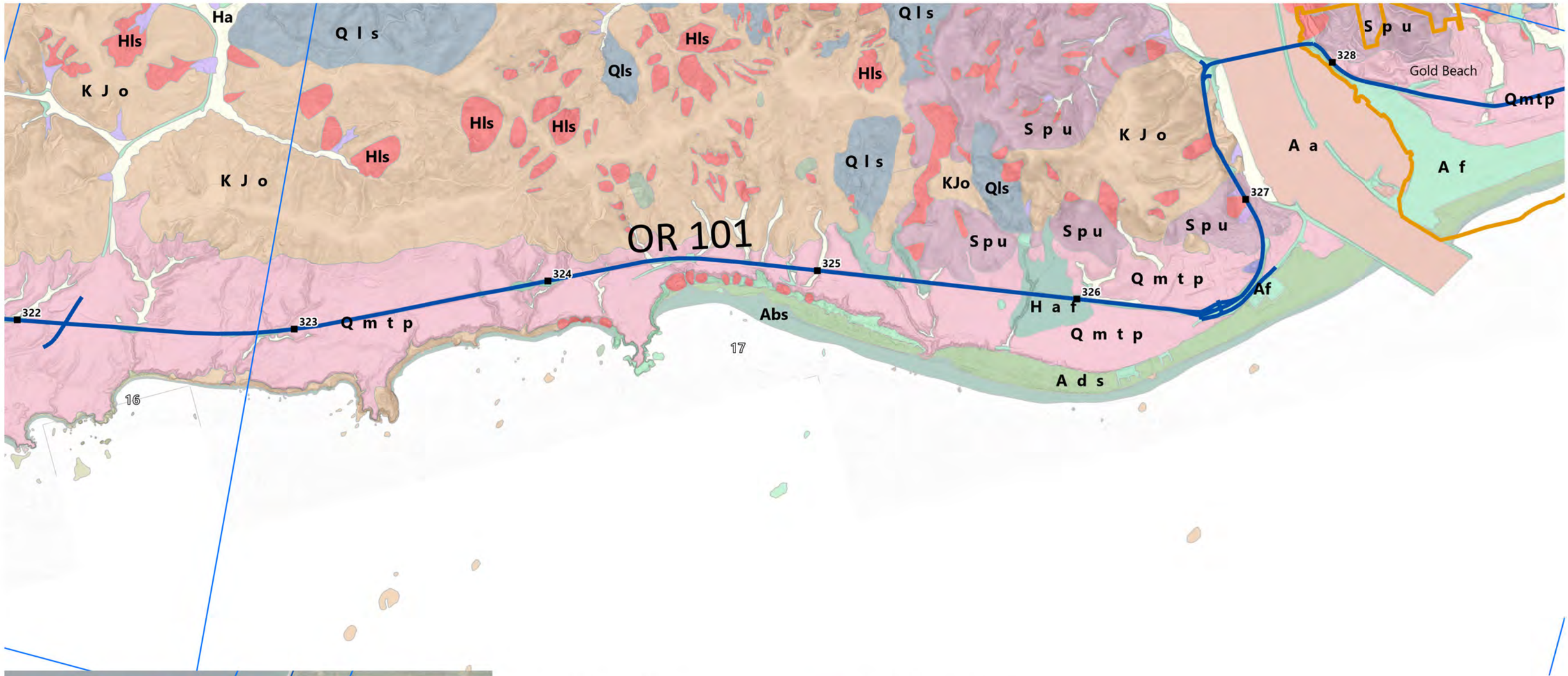
0 2,000 4,000 FT

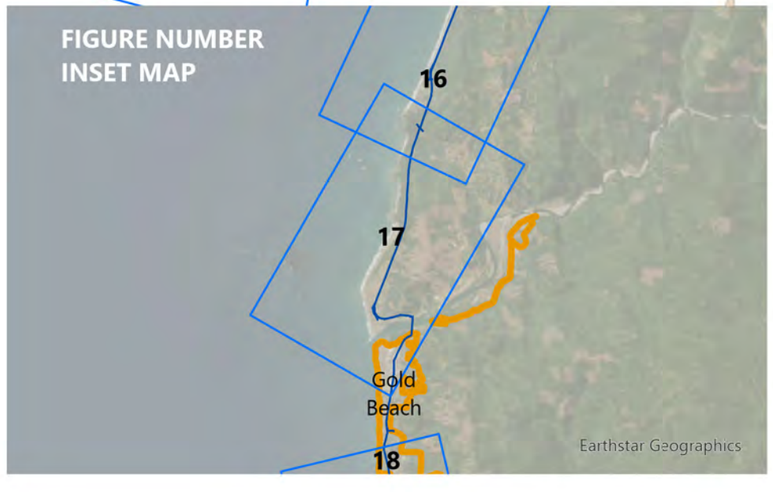
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 16





- ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Haf Alluvial fan deposits
- Hdf Debris fan deposits
- Hls Landslide deposits
- Hrf Rock fall and colluvium
- KJid Diorite
- KJo Otter Point Formation, undivided
- KJoc Otter Point Formation, Chert
- KJog Otter Point Formation, Clast-supported conglomerate
- KJos Otter Point Formation, sandstone
- KJov Otter Point Formation, Volcanic rocks
- Qls Landslide deposits
- Qmtp Pioneer terrace sediments
- Qmts Silver Butte terrace sediments
- Spu Serpentinized ultramafic rocks

N

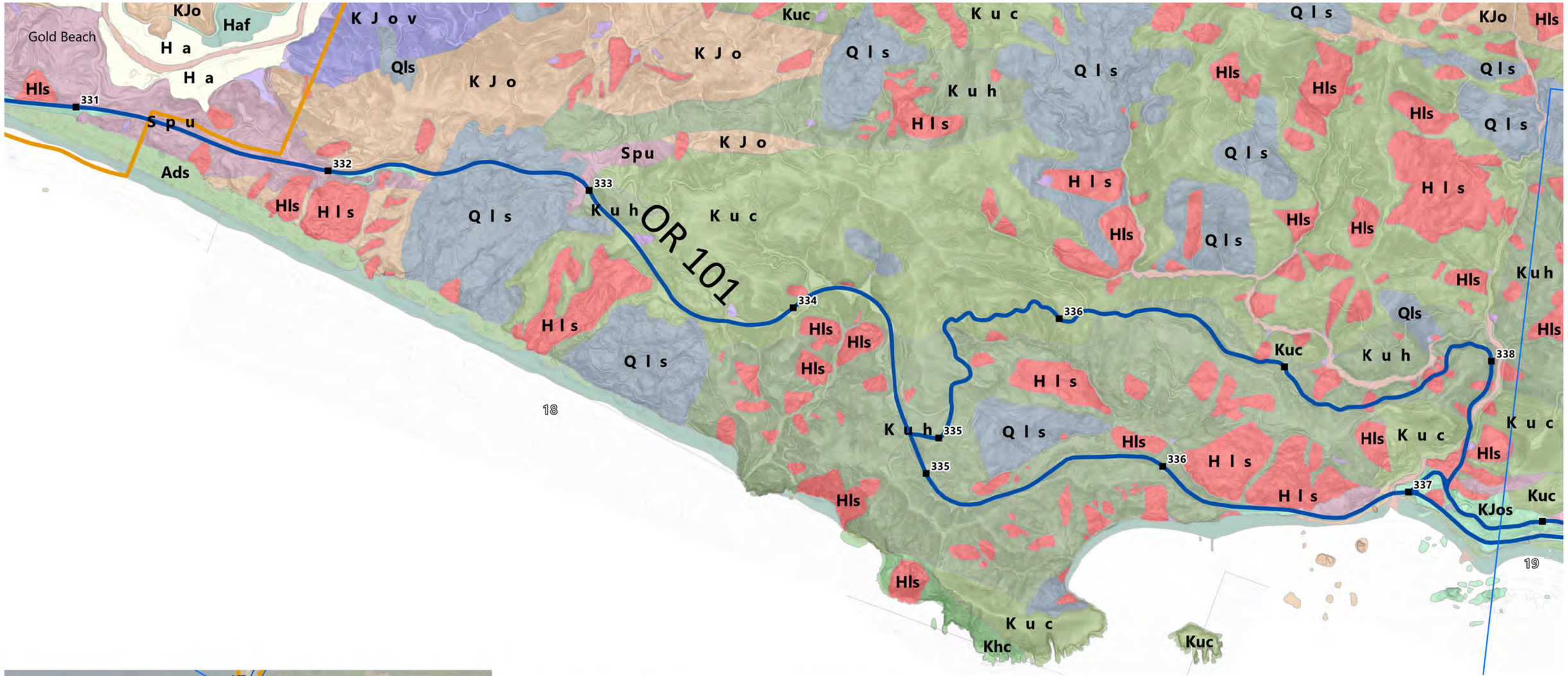
0 2,000 4,000 FT

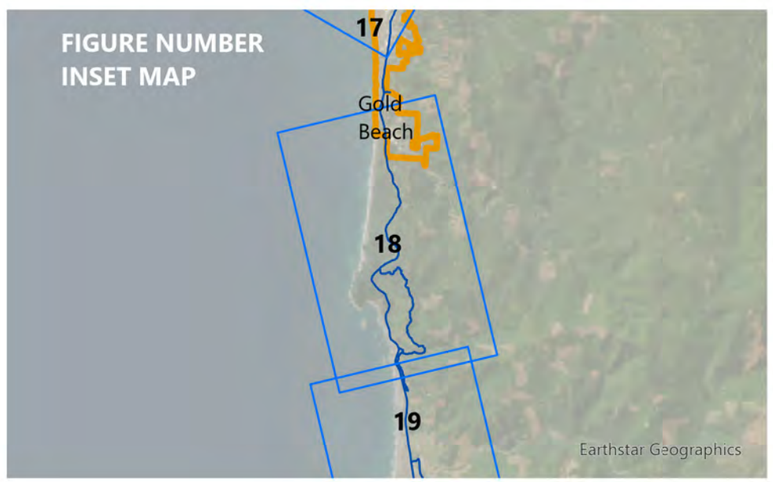
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 17





- ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Haf Alluvial fan deposits
- Hdf Debris fan deposits
- Hls Landslide deposits
- KJid Diorite
- KJo Otter Point Formation, undivided
- KJos Otter Point Formation, sandstone
- KJov Otter Point Formation, Volcanic rocks
- Khc Houstenaden Creek Formation
- Kuc Cape Sebastian Sandstone
- Kuh Hunters Cove Formation, undivided
- Qls Landslide deposits
- Qmtp Pioneer terrace sediments
- Spu Serpentinized ultramafic rocks

N

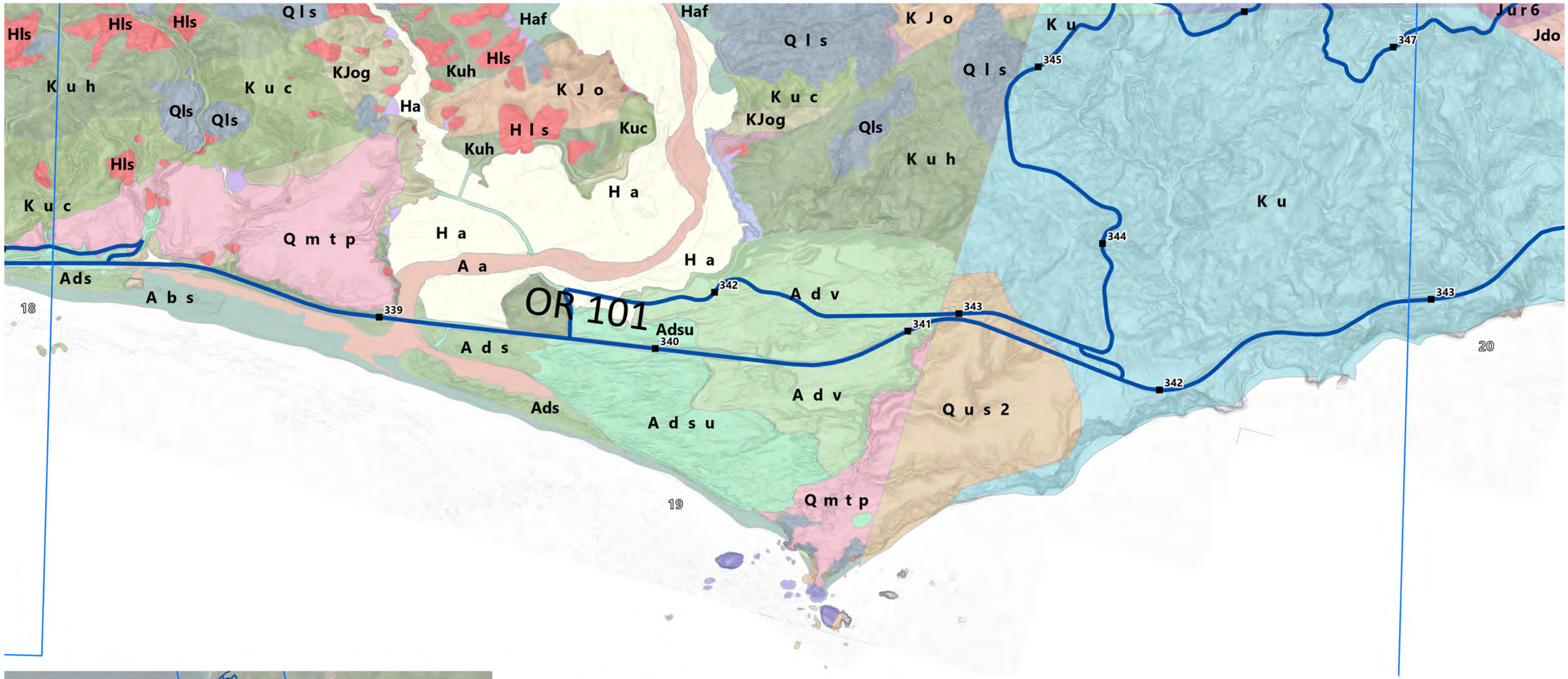
0 2,000 4,000 FT

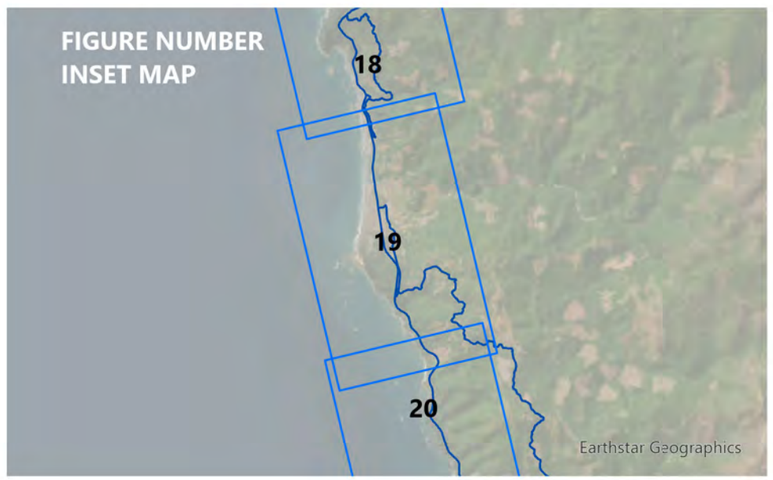
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 18





- ODOT MILE POSTS

GEOLOGIC UNITS

- Aa Alluvium
- Abs Beach deposits
- Ads Back-beach dune deposits
- Adsu Unvegetate dune deposits
- Adv Vegetate dune deposits
- Af Modern fill and construction material
- Als Landslide deposits
- Ha Alluvium
- Haf Alluvial fan deposits
- Hdf Debris fan deposits
- Hls Landslide deposits
- Jdo Latest Jurassic sedimentary and volcanic rocks, Dothan
- Jdo1 Latest Jurassic sedimentary and volcanic rocks, Dothan
- Jur6 Ultramafic rocks
- Jv1 Latest Jurassic sedimentary and volcanic rocks Otter
- KJo Otter Point Formation, undivided
- KJog Otter Point Formation, Clast-supported conglomerate
- KJos Otter Point Formation, sandstone
- KJov Otter Point Formation, Volcanic rocks
- Ku Cretaceous marine sedimentary rocks, Cape Sebastian

N

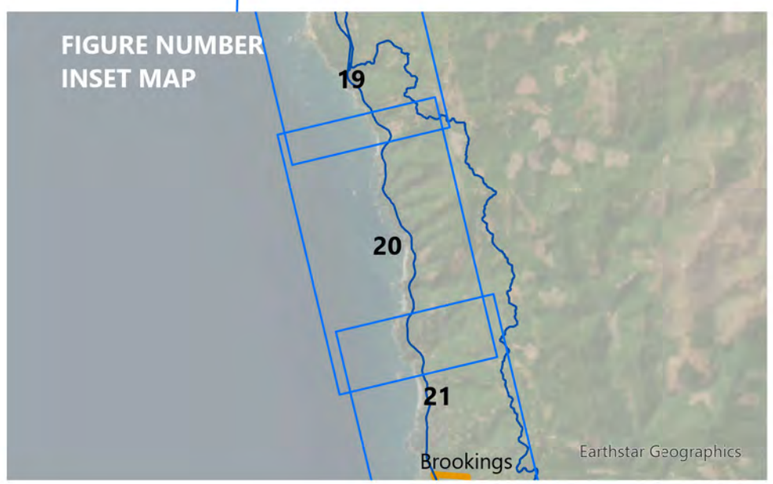
0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 19



■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jdo Latest Jurassic sedimentary and volcanic rocks, Dothan and Otter Point Formation
- Jur Ultramafic rocks
- Ku Cretaceous marine sedimentary rocks, Cape Sebastian sandstone and Hunter Cove Formation sandstone
- Qus Quaternary unconsolidated sediments

N

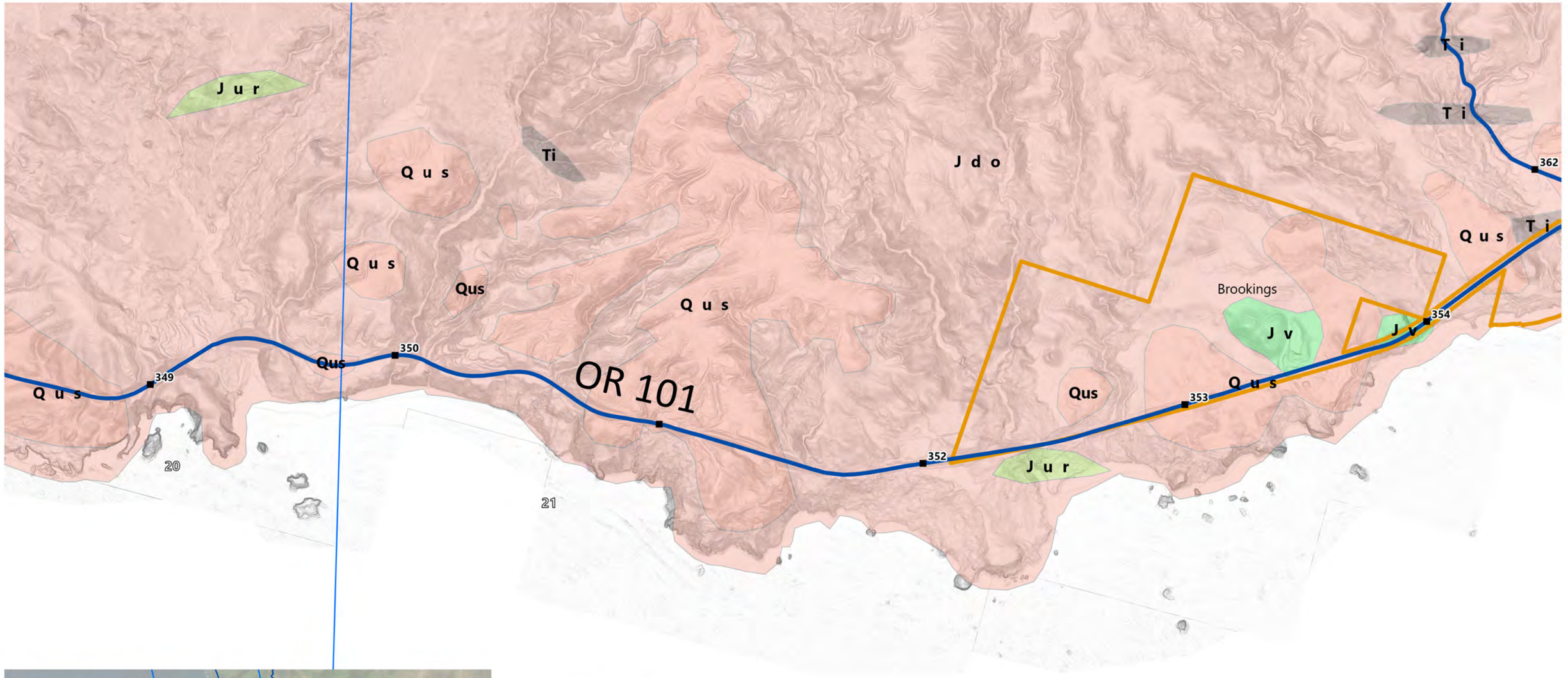
0 2,000 4,000 FT

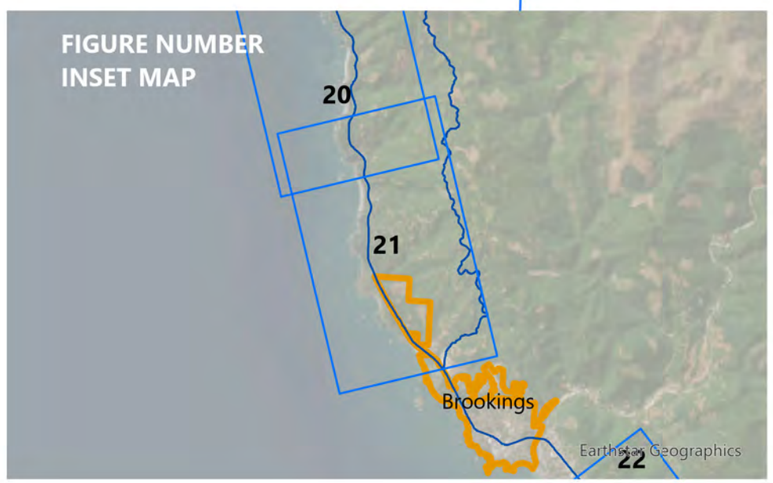
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 20





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jdo Latest Jurassic sedimentary and volcanic rocks, Dothan and Otter Point Formation
- Jur Ultramafic rocks
- Jv Latest Jurassic sedimentary and volcanic rocks Otter Point and Dothan Formations
- Qus Quaternary unconsolidated sediments
- Ti Fine-grained intrusive igneous rocks

N

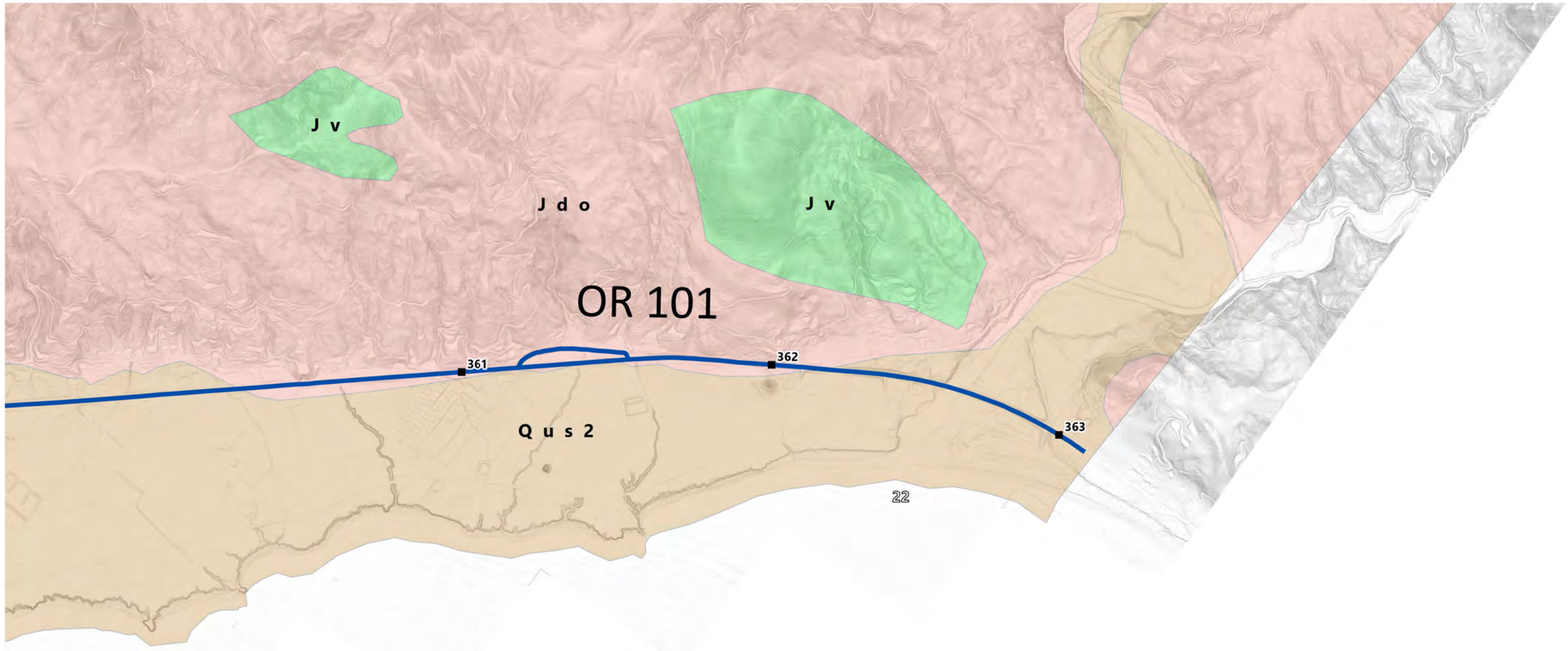
0 2,000 4,000 FT

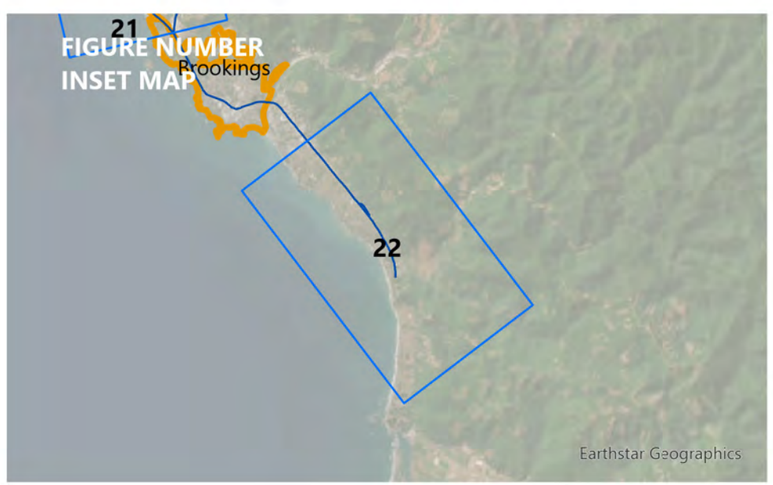
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 21





■ ODOT MILE POSTS

GEOLOGIC UNITS

Jdo Latest Jurassic sedimentary and volcanic rocks, Dothan and Otter Point Formation

Jv Latest Jurassic sedimentary and volcanic rocks Otter Point and Dothan Formations

Qus2 Quaternary unconsolidated sediments

N

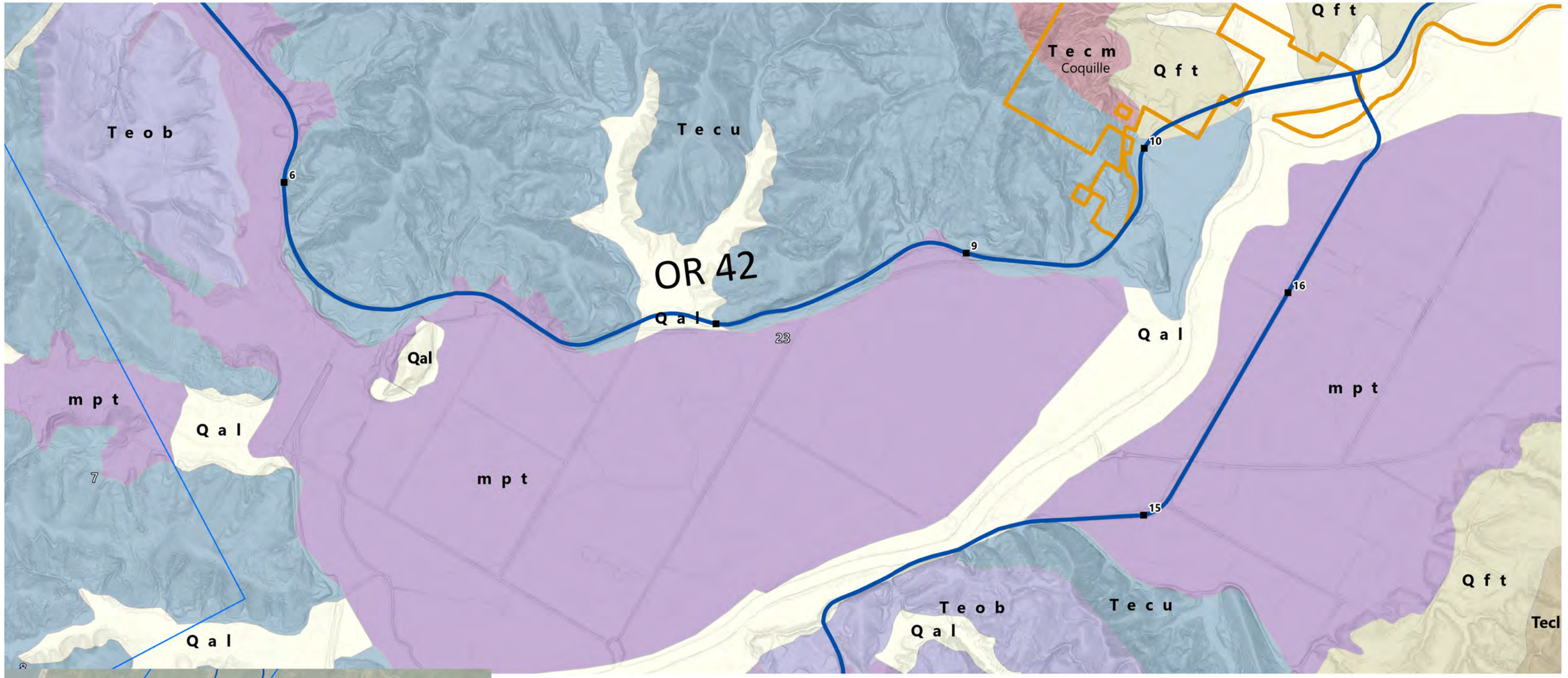
0 2,000 4,000 FT

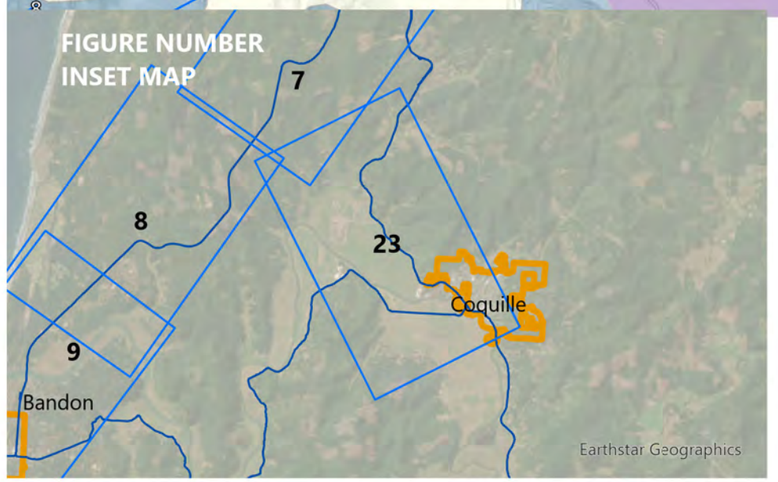
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-H) BROOKINGS TO CA BORDER

APR. 2024 JOB NO. 6897-A FIG. 22





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Quaternary alluvium
- Qft Quaternary fluvial terrace deposits
- Tecl Coaledo Formation, lower member
- Tecm Coaledo Formation, middle member
- Tecu Coaledo Formation, upper member
- Teob Bastendorff Formation
- mpt Marsh and peat

N

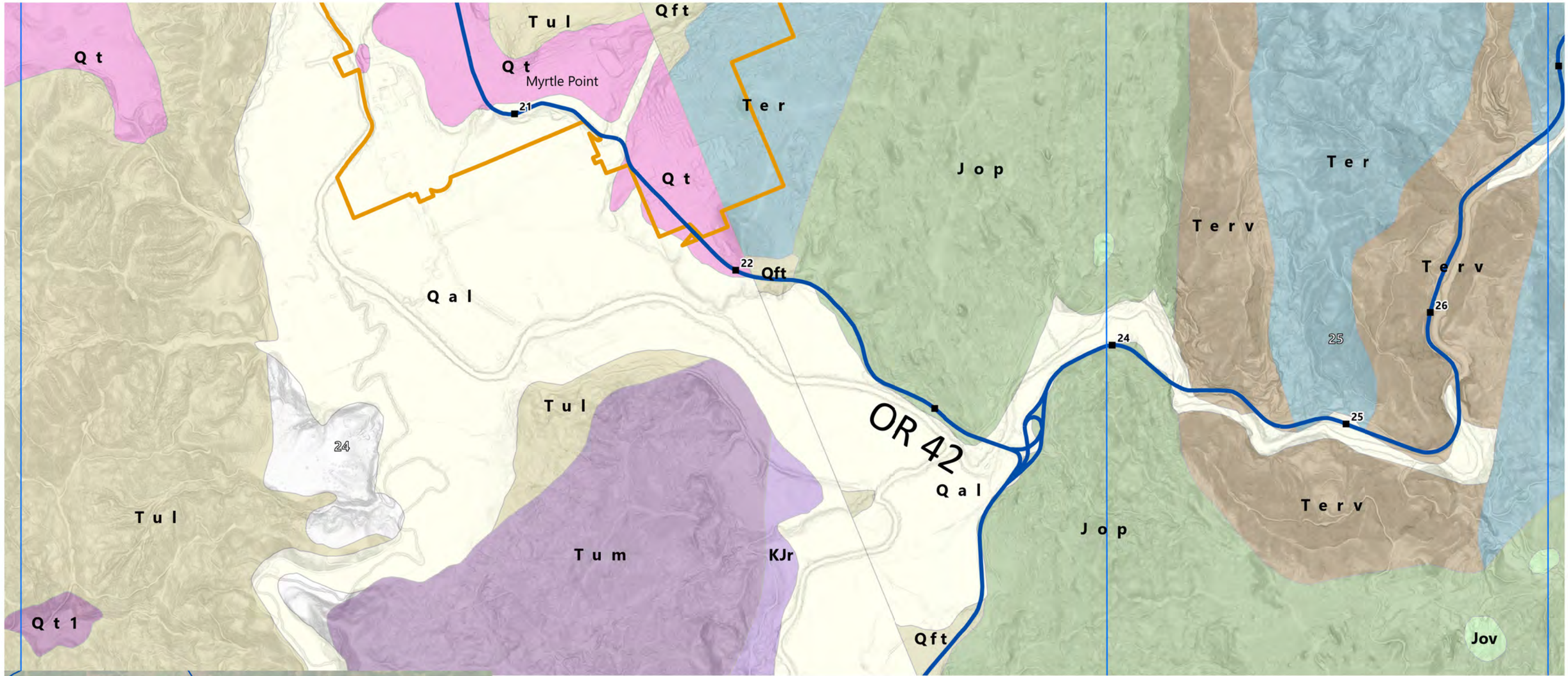
0 2,000 4,000 FT

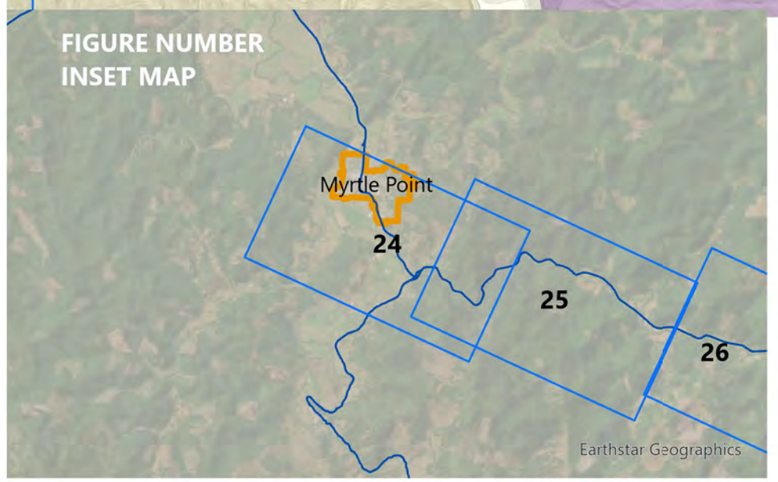
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-A) WEST OF COQUILLE

APR. 2024 JOB NO. 6897-A FIG. 23





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jop Otter Point Formation, sedimentary rock
- Jov Otter Point Formation, volcanic rock
- KJr Lower Cretaceous and Upper Jurassic rocks
- Qal Alluvium
- Qal Quaternary alluvium
- Qft Quaternary fluvial terrace deposits
- Qt Terrace sand and gravel
- Qt1 Terrace sand and gravel
- Ter Roseburg Formation
- Terv Roseburg Formation, basalt
- Tul Umpqua Formation, lower member, sedimentary
- Tum Umpqua Formation, middle member,

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

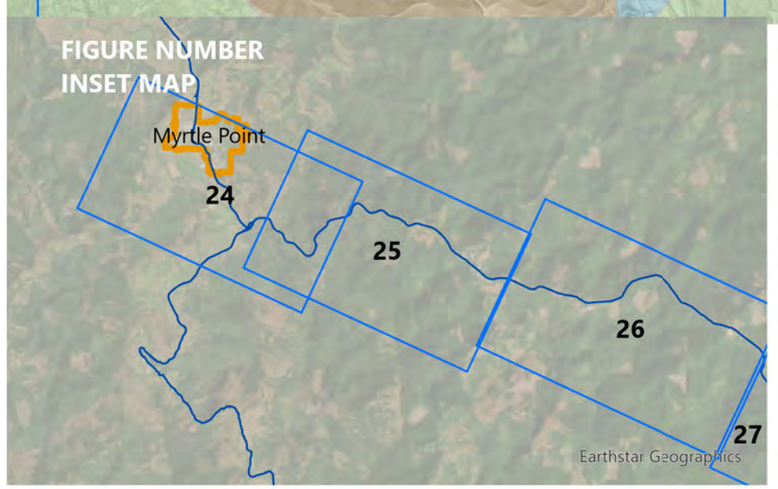
(42-B) MYRTLE POINT TO OR 542

APR. 2024 JOB NO. 6897-A FIG. 24

OR 42

Jop
Terv
Qal
Ter
Qft
Qal
Tmms
Tum
Js
KJdm

24
25
26
27
29
30
31



■ ODOT MILE POSTS

GEOLOGIC UNITS

- Jop Otter Point Formation
- Jop Otter Point Formation, sedimentary rock
- Jov Otter Point Formation, volcanic rock
- Js Otter Point Formation, blueschist
- KJdm Dothan Formation, mudstone matrix melange
- Qal Quaternary alluvium
- Qft Fluvial terrace deposits
- Qft Quaternary fluvial terrace deposits
- Qls Landslide deposits
- Ter Roseburg Formation
- Terv Roseburg Formation, basalt
- Tmms Tenmile Formation, mudstone and
- Tum Middle Umpqua Member

N

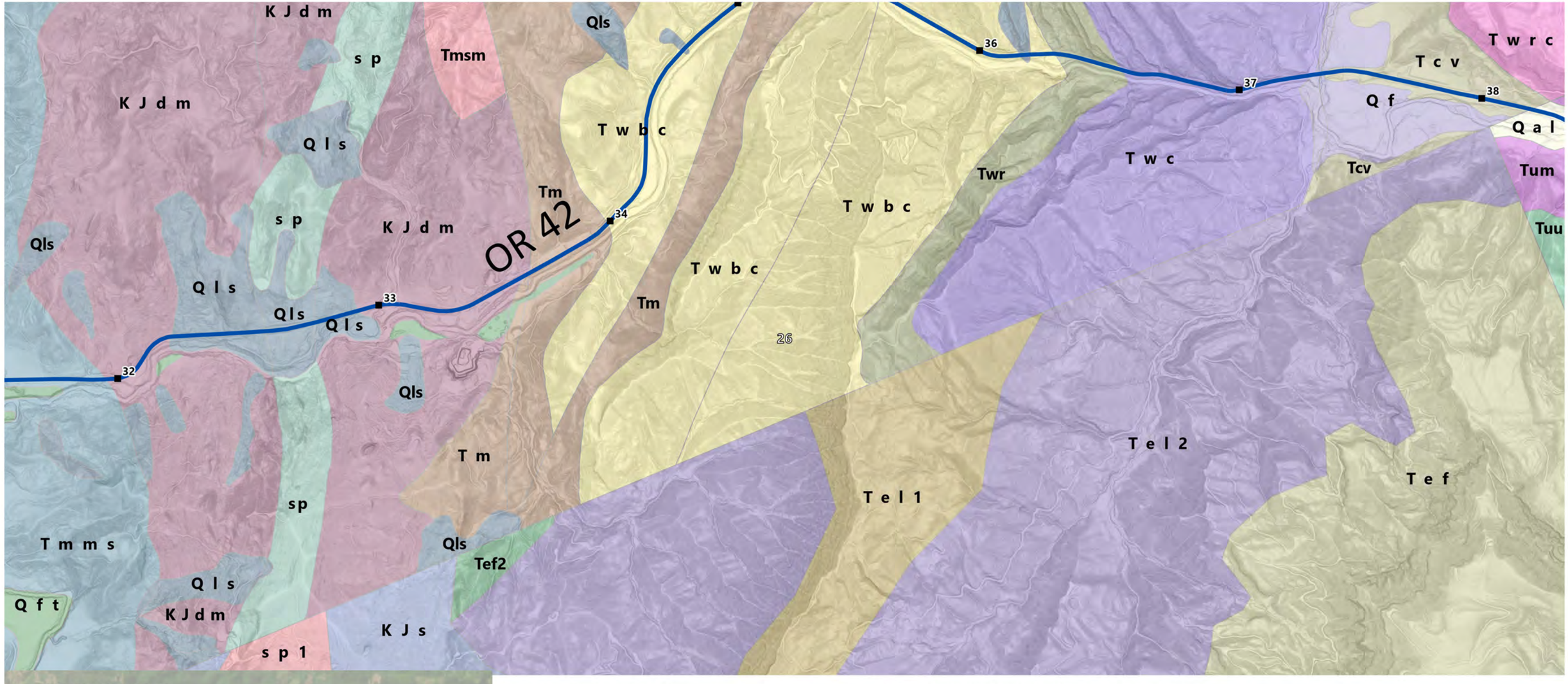
0 2,000 4,000 FT

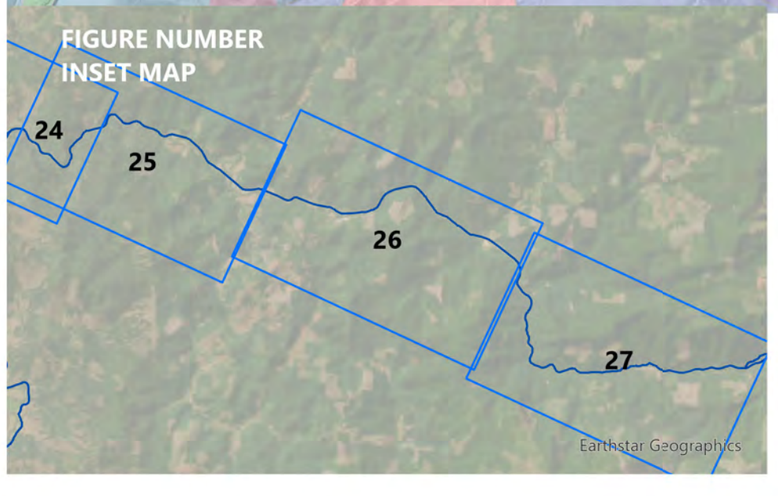
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-B) MYRTLE POINT TO OR 542

APR. 2024 JOB NO. 6897-A FIG. 25





■ ODOT MILE POSTS

GEOLOGIC UNITS

- KJdm Dothan Formation, mudstone matrix melange
- KJs Melange and Broken Formation
- Qal Alluvium
- Qf Fluvial deposits
- Qft Fluvial terrace deposits
- Qls Landslide deposits
- Tcv Umpqua Group, Camas Valley Formation
- Tef Undiff. Flournoy Formation
- Tef2 Flournoy Formation, Camas Valley member
- Tel1 Lookingglass Formation, Bushnell Rock
- Tel2 Lookingglass Formation, Tenmile member
- Tm Tenmile Formation, undivided
- Tmms Tenmile Formation, mudstone and
- Tmsm Tenmile Formation, turbidite sandstone
- Tum Umpqua Formation, middle member
- Tuu Umpqua Formation, upper member
- Twbc White Tail Ridge Formation, Berry Creek
- Twc White Tail Ridge Formation, Coquille River
- Twr White Tail Ridge Formation, Remote
- Twrc White Tail Ridge Formation, Rasler Creek

N

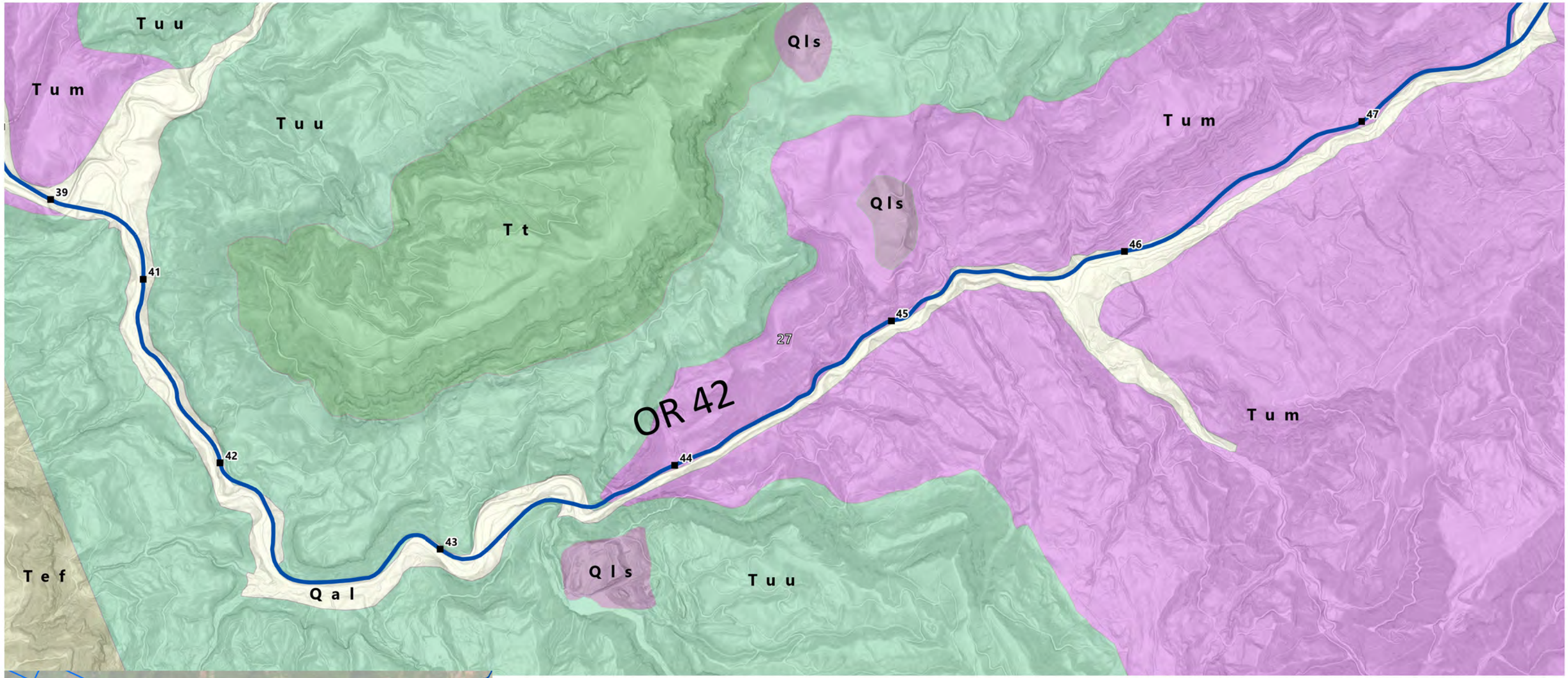
0 2,000 4,000 FT

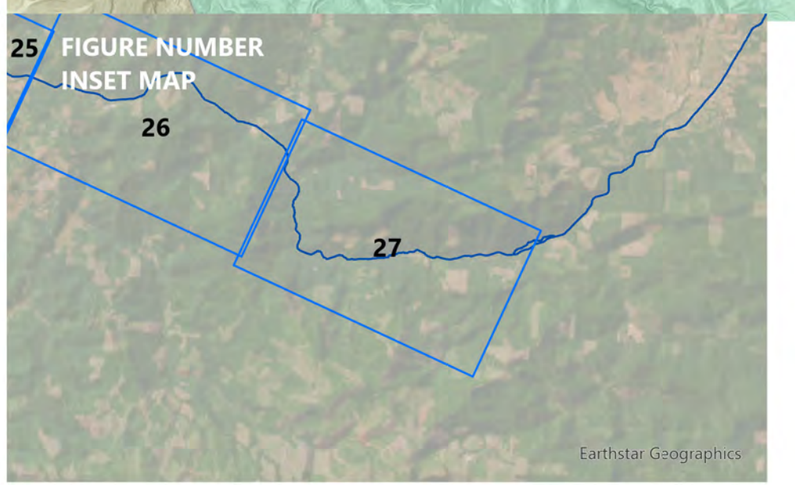
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-C) OR542 JUNCTION TO OR 42 COUPLET

APR. 2024 JOB NO. 6897-A FIG. 26





■ ODOT MILE POSTS

GEOLOGIC UNITS

- Qal Alluvium
- Qls Landslide
- Tef Undiff. Flournoy Formation
- Tt Tyee Formation
- Tum Umpqua Formation, middle member
- Tuu Umpqua Formation, upper member

N

0 2,000 4,000 FT

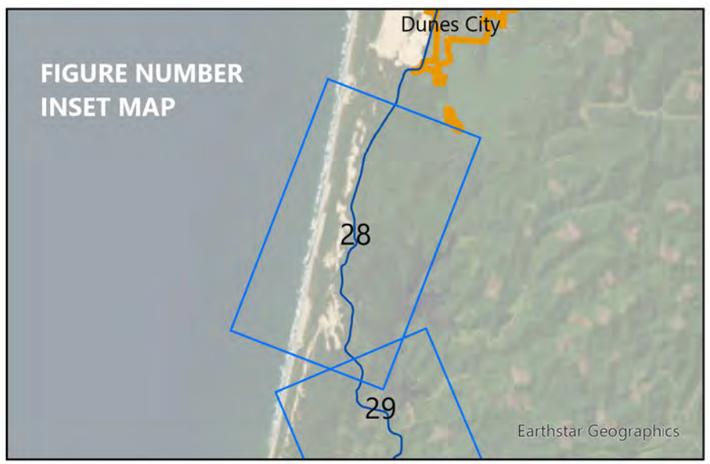
GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-C) OR542 JUNCTION TO OR 42 COUPLET

APR. 2024 JOB NO. 6897-A FIG. 27

OR 101

199
200
28
201
202
203
204
29



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-A) DOUGLAS COUNTY LINE TO REEDSPORT

APR. 2024 JOB NO. 6897-A FIG. 28

OR 101

28

29

205

206

207

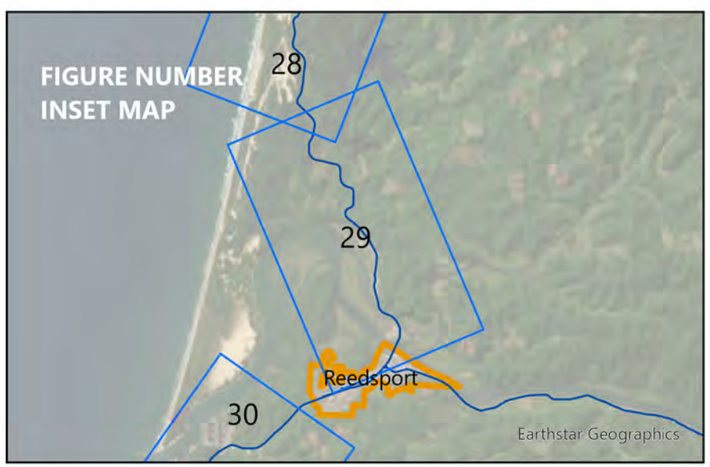
208

209

210

211

Reedsport



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

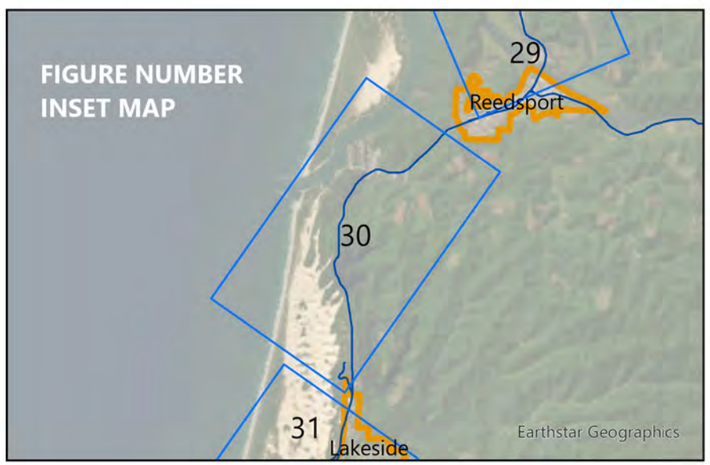
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-A) DOUGLAS COUNTY LINE TO REEDSPORT

APR. 2024 JOB NO. 6897-A FIG. 29

214
215
216
217
218
219
220
30
OR 101



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

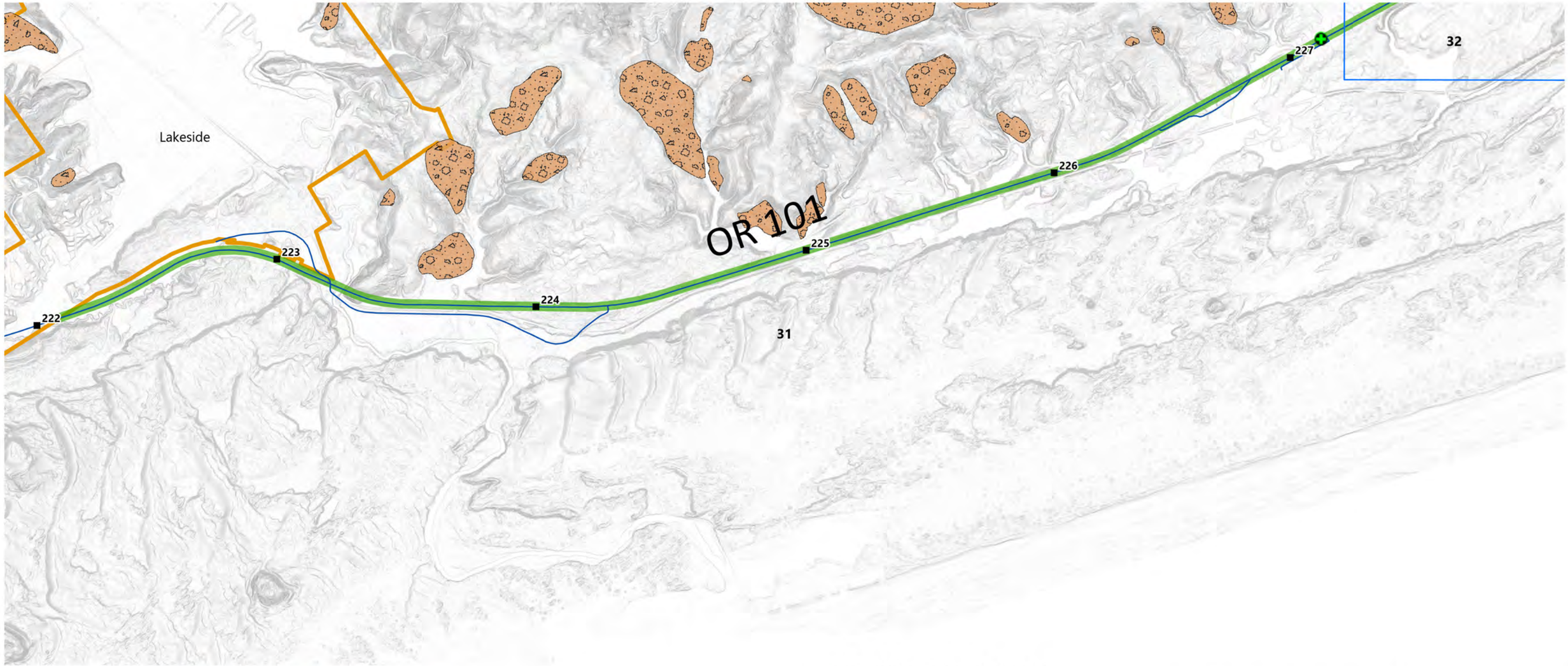
0 2,000 4,000 FT

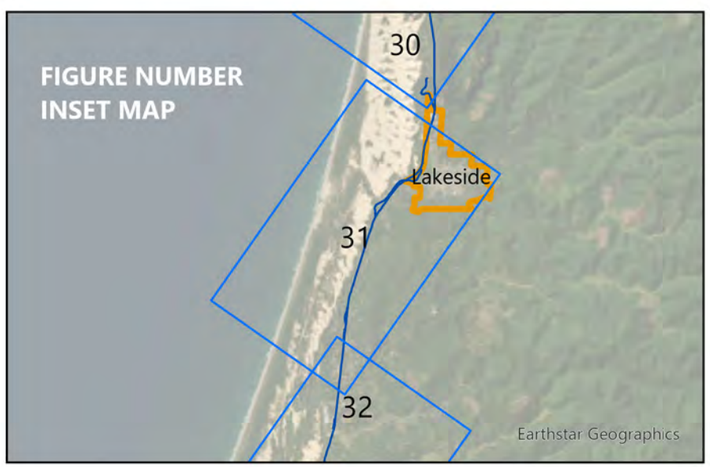
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-B) REEDSPORT TO LAKESIDE

APR. 2024 JOB NO. 6897-A FIG. 30





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-C) LAKESIDE TO NORTH BEND

APR. 2024 JOB NO. 6897-A FIG. 31

North Bend

233

232

231

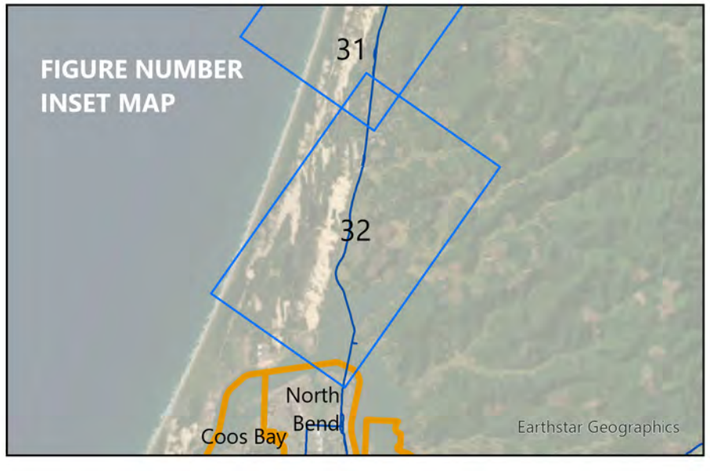
230

229

OR 101

32

31



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

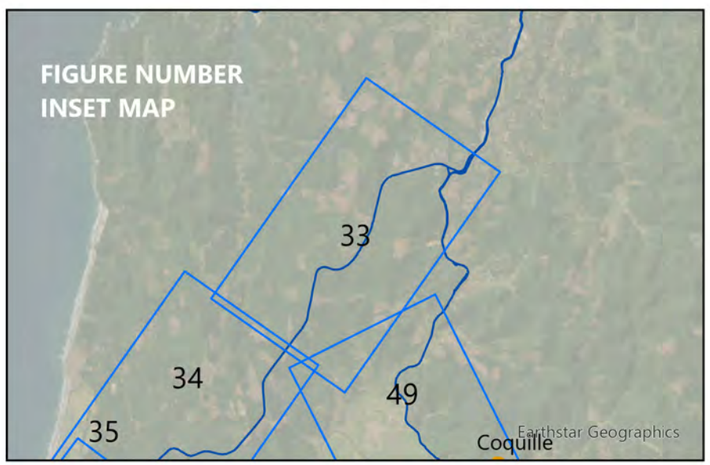
DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-C) LAKESIDE TO NORTH BEND

APR. 2024 JOB NO. 6897-A FIG. 32

OR 101

1
245
246
247
33
249
250
251
49
34



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

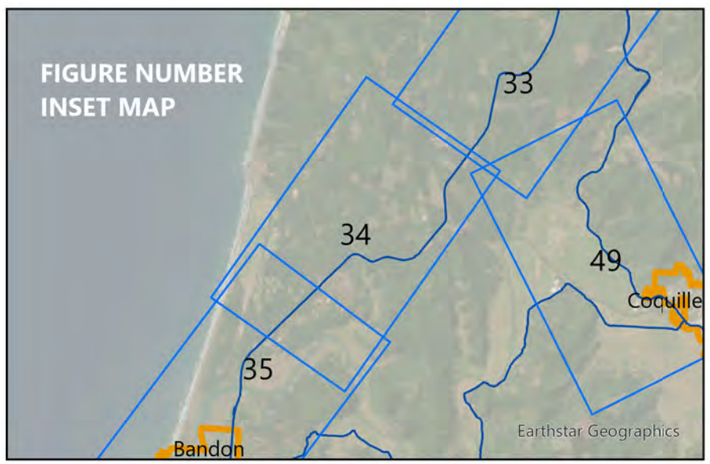
DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 33

OR 101

252
255
256
257
33
34
35



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

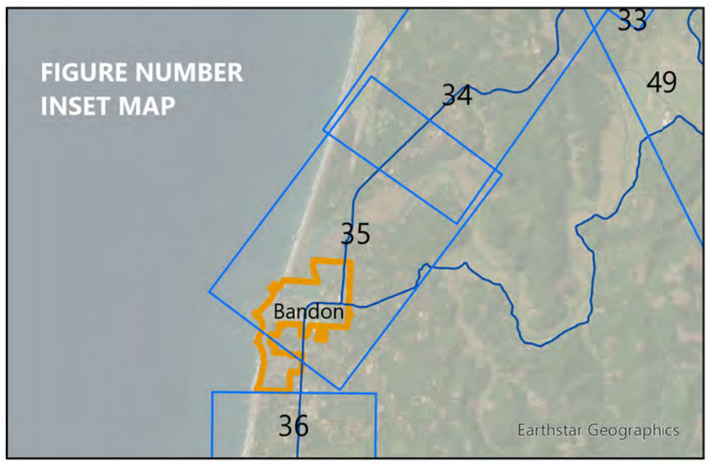
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 34

34
35
OR 101
257
258
259
260
261
274
Bandon
275



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

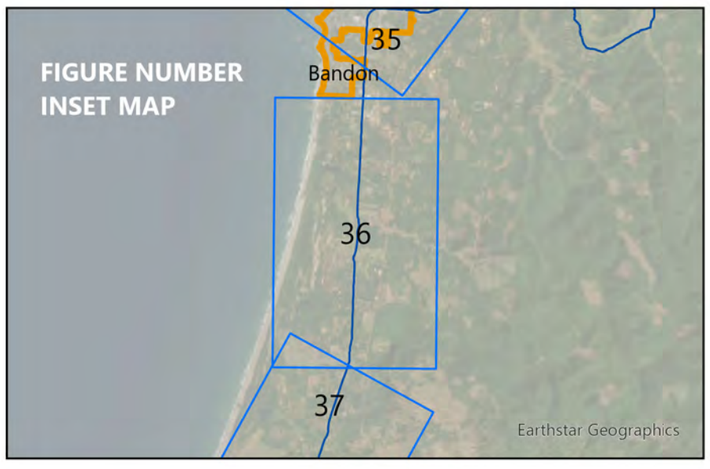
DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-D) US101-OR42 JUNCTION TO BANDON

APR. 2024 JOB NO. 6897-A FIG. 35

OR 101

277 278 279 36 280 281 282 37



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

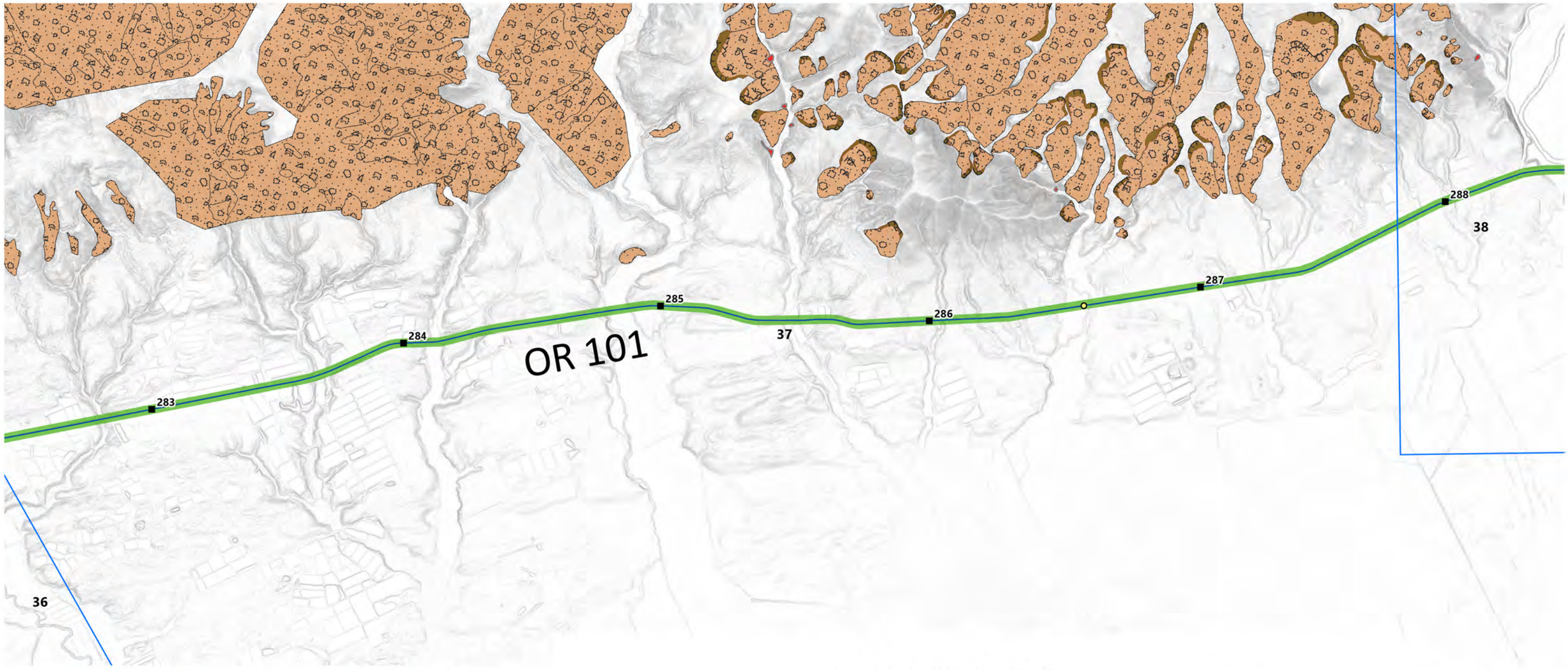
Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

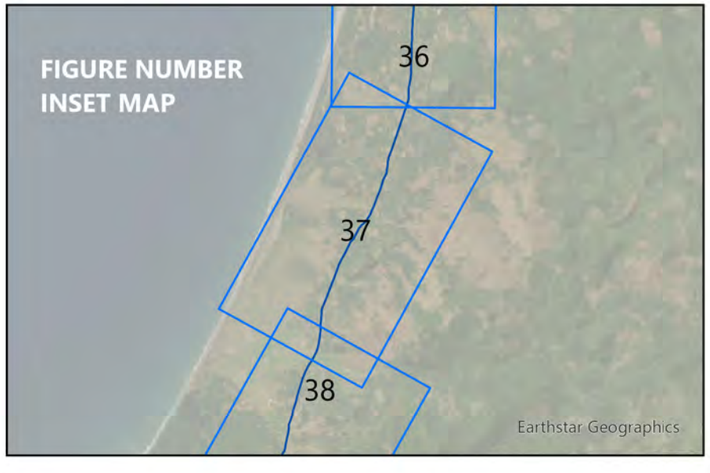
N 0 2,000 4,000 FT

GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 36





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

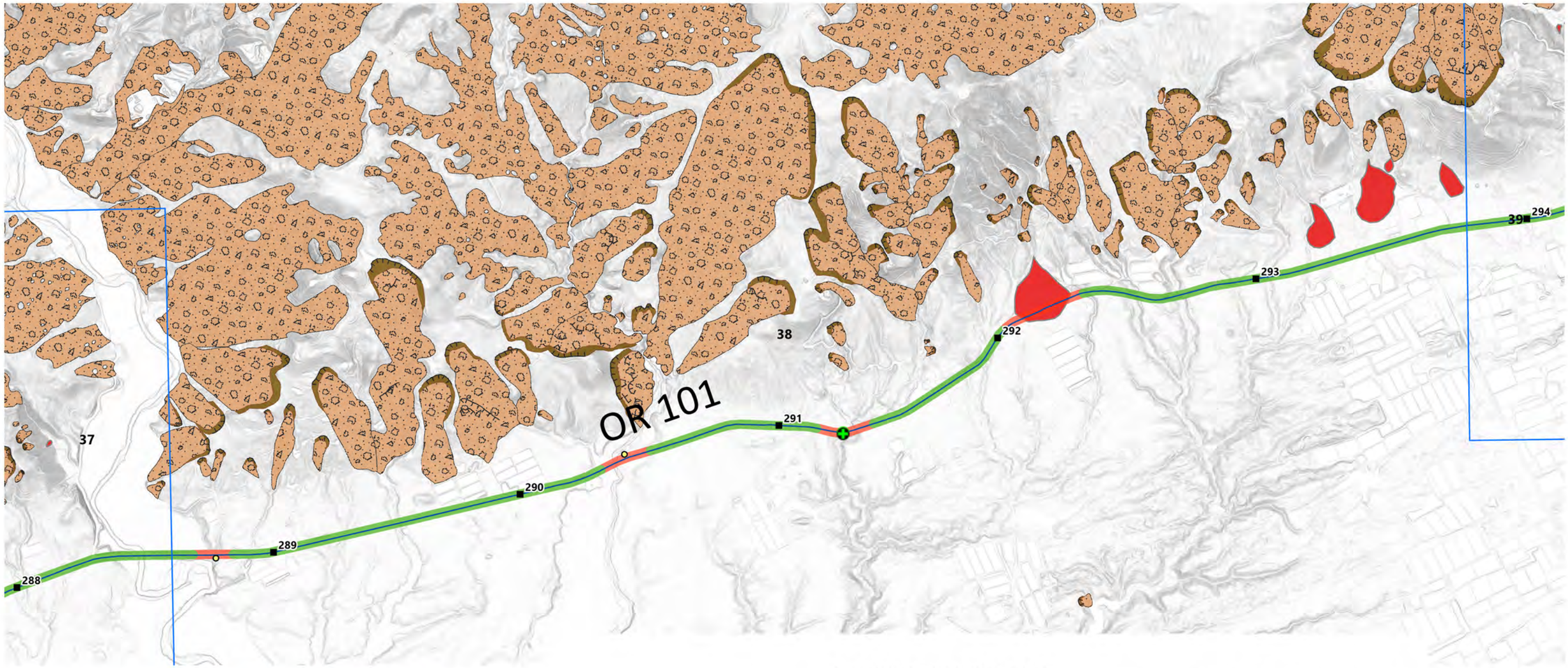
0 2,000 4,000 FT

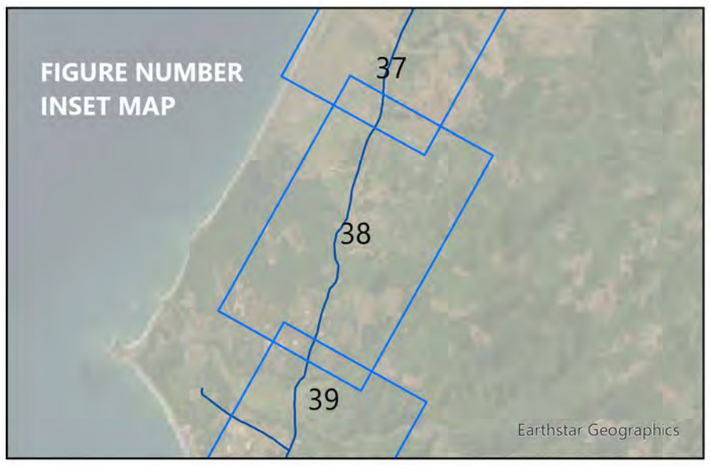
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 37





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

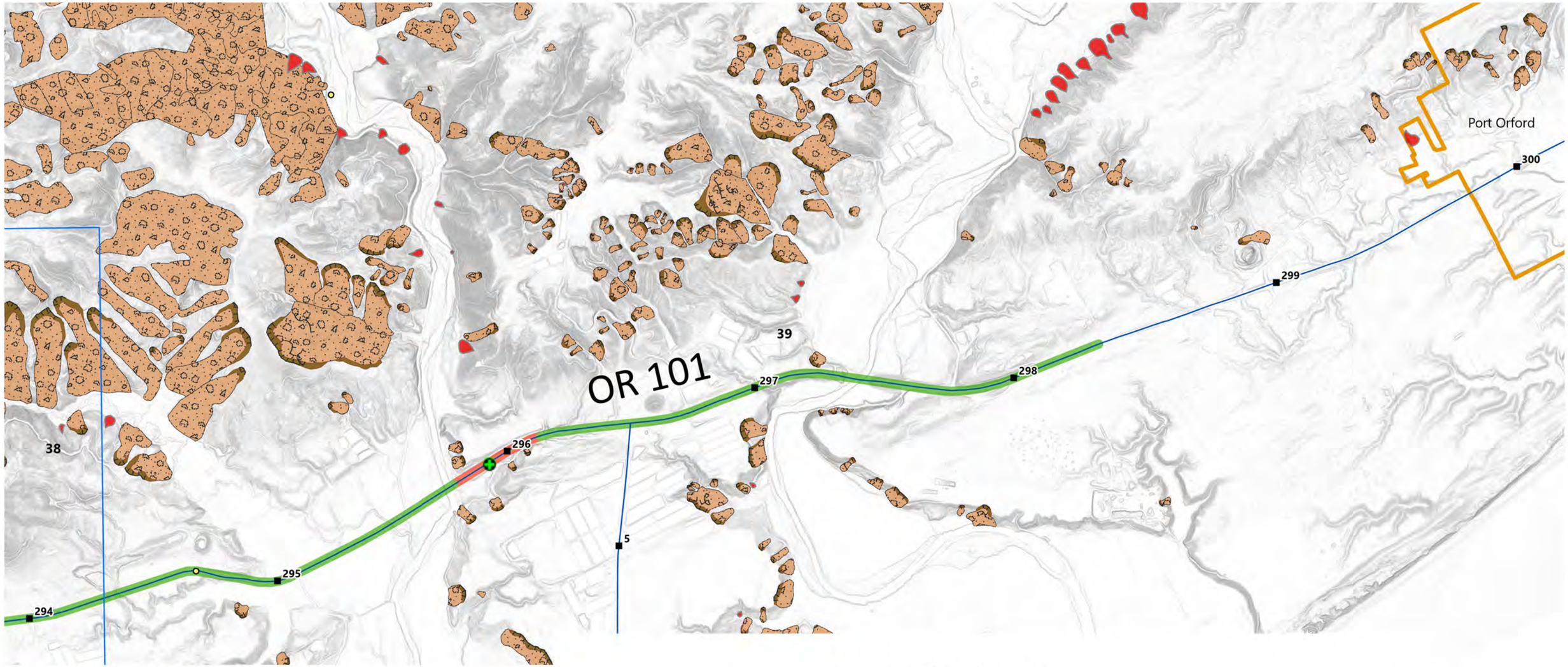
0 2,000 4,000 FT

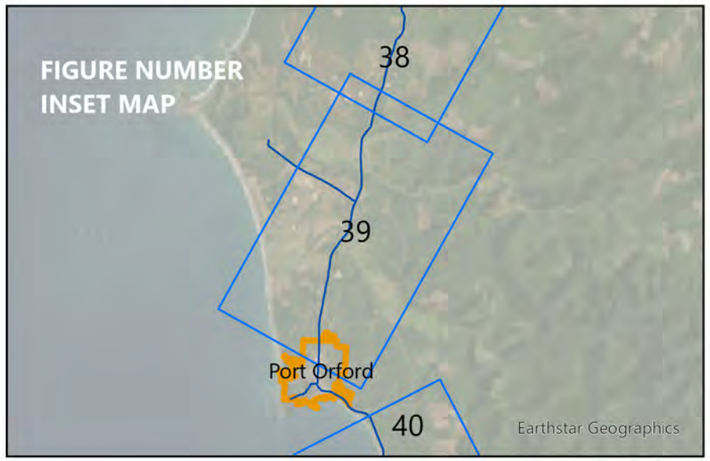
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 38





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

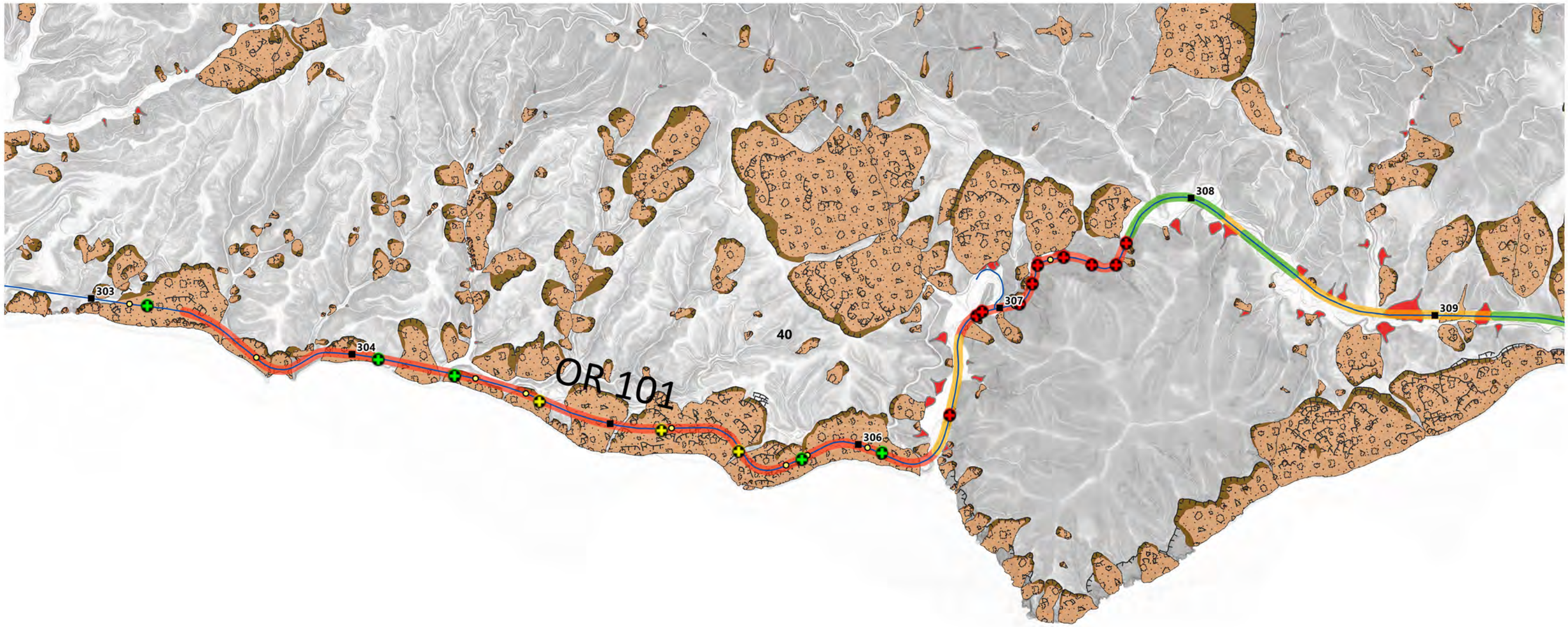
0 2,000 4,000 FT

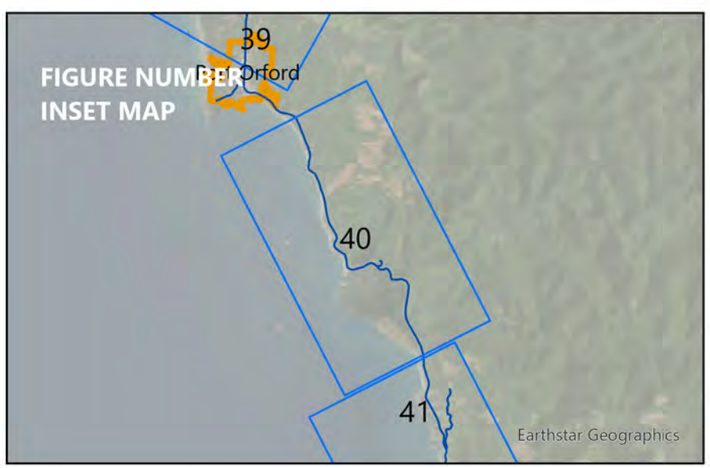
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-E) BANDON TO PORT ORFORD

APR. 2024 JOB NO. 6897-A FIG. 39





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

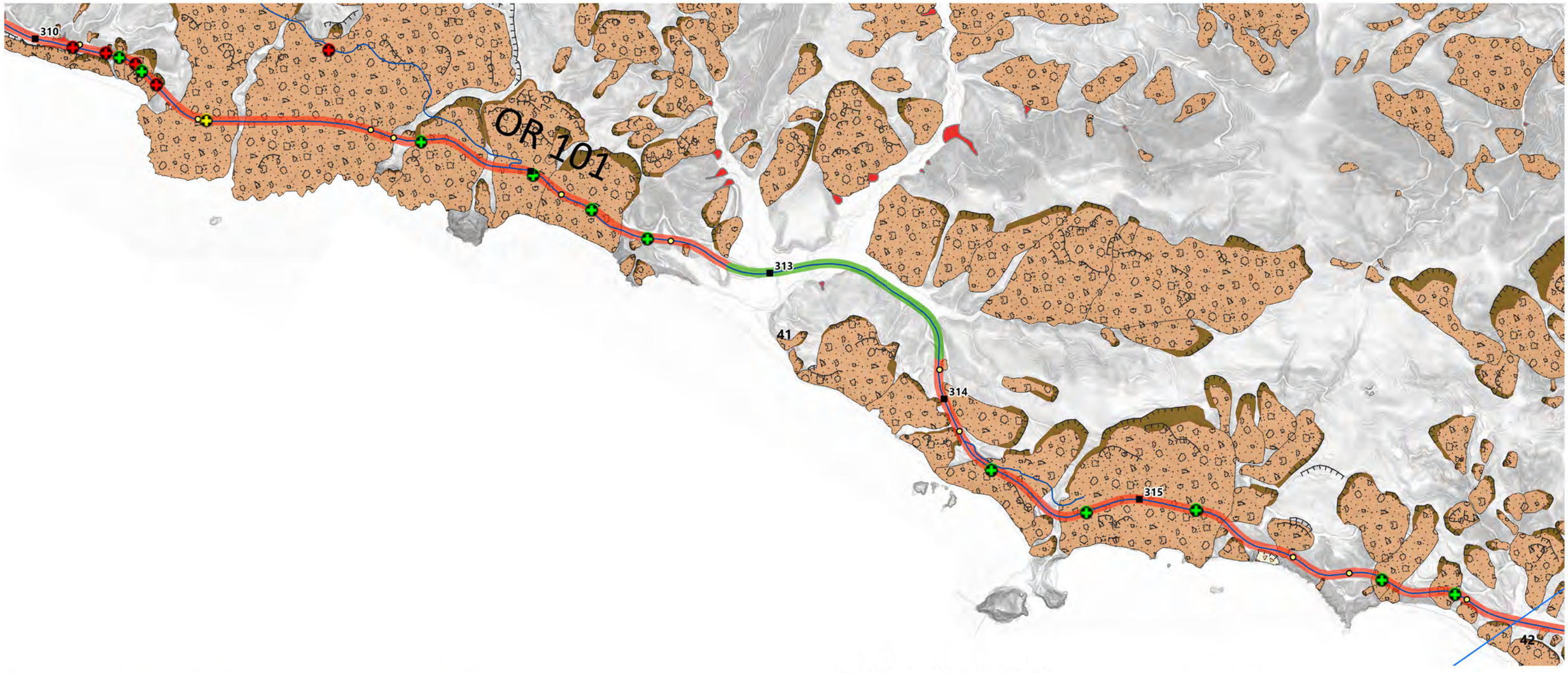
0 2,000 4,000 FT

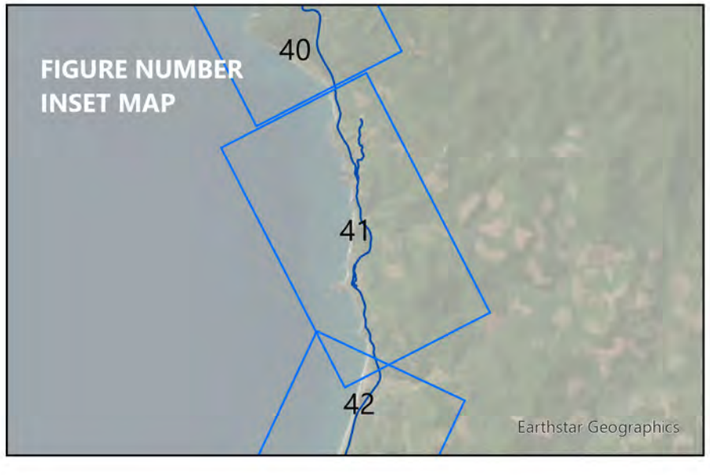
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 40





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

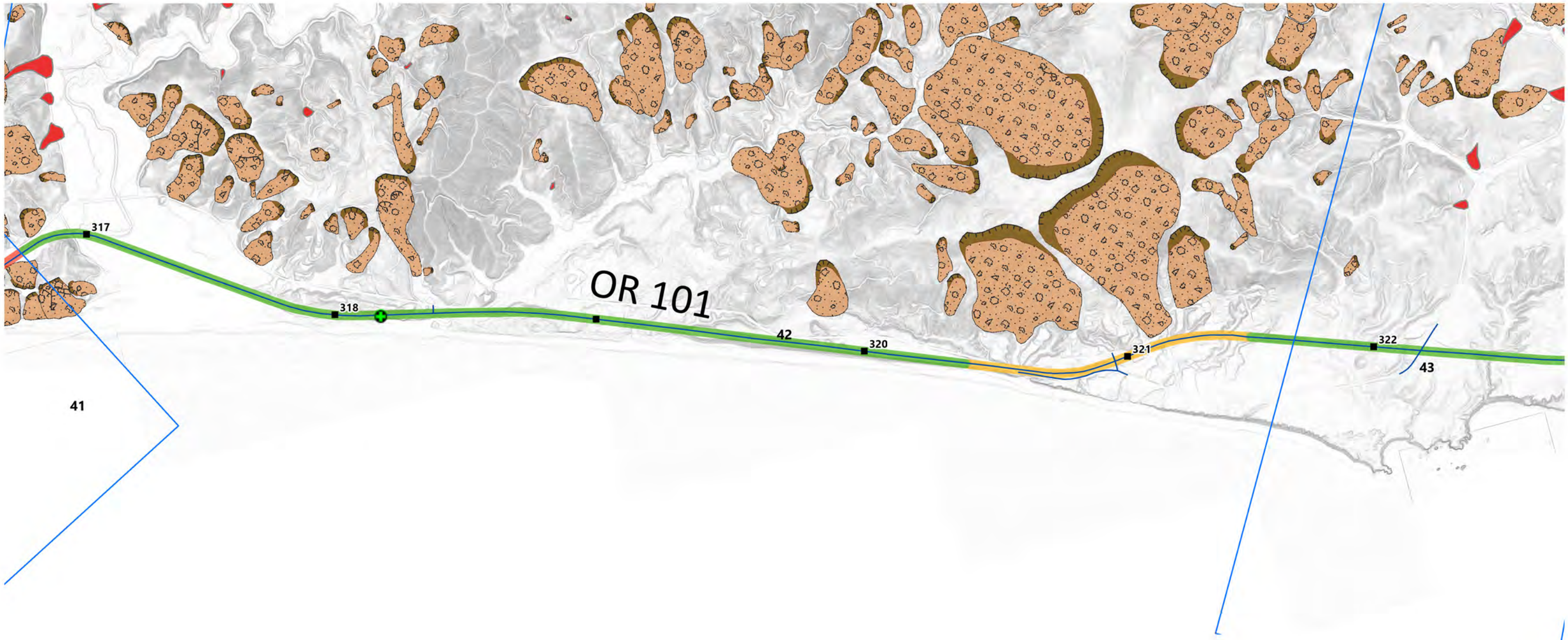
0 2,000 4,000 FT

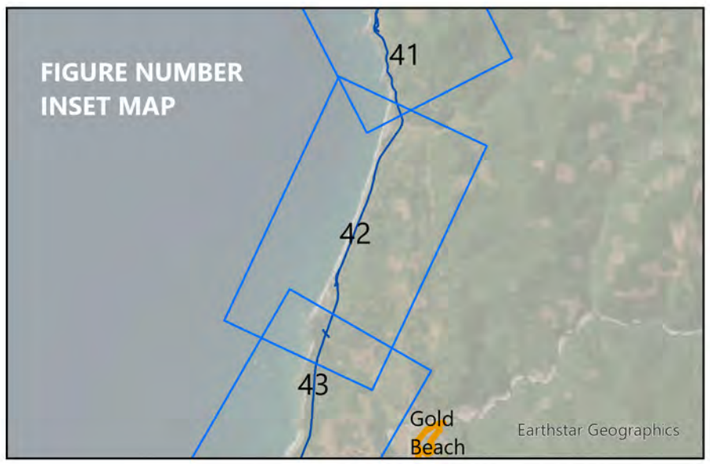
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 41





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

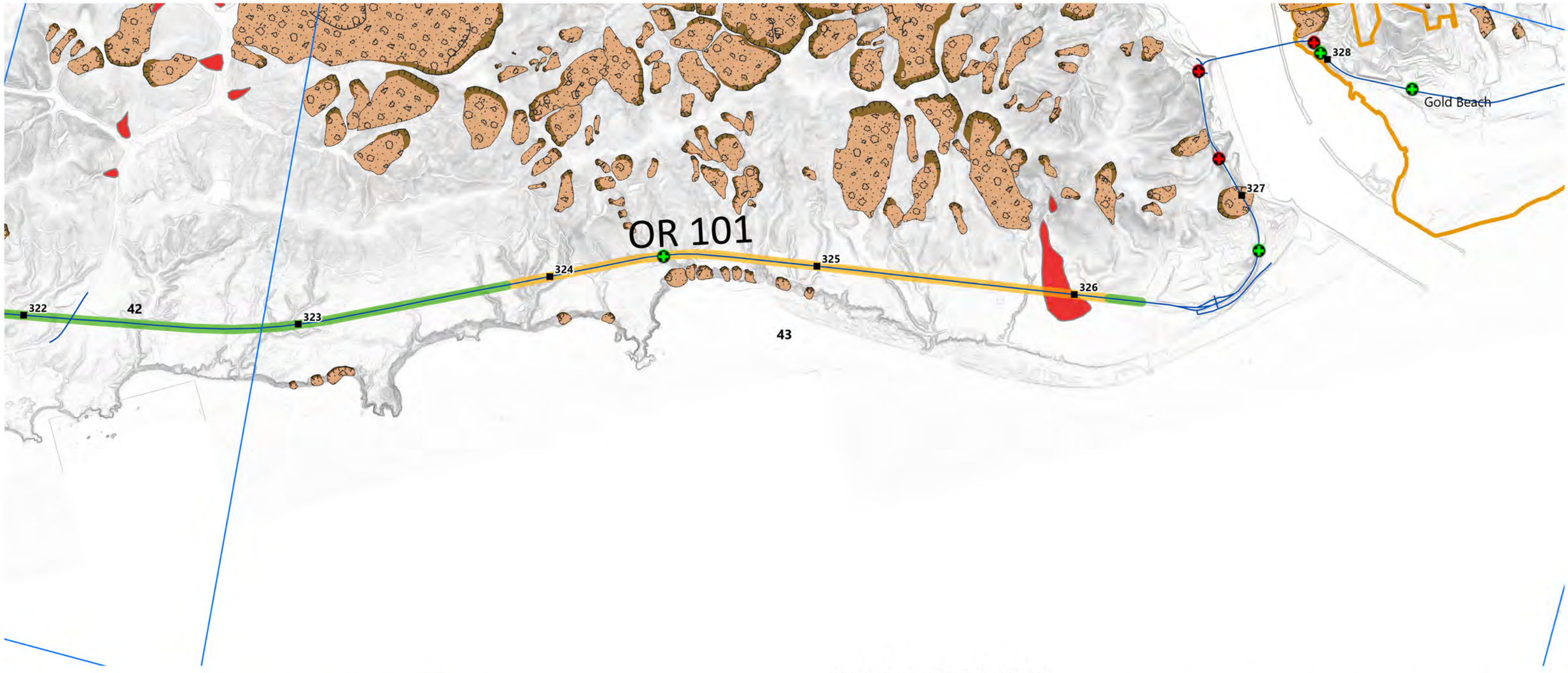
0 2,000 4,000 FT

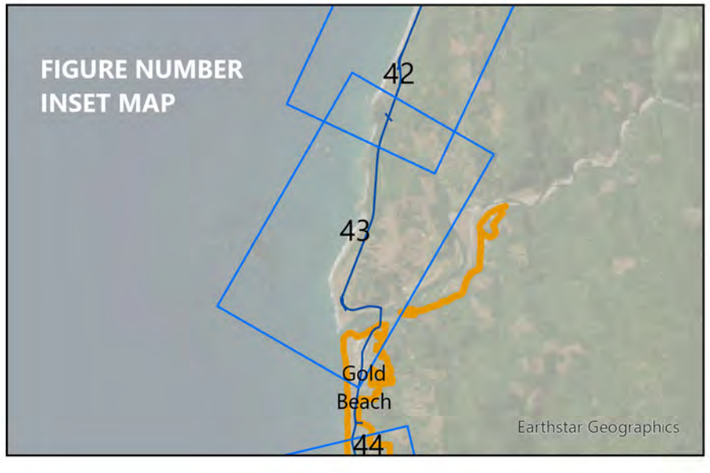
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 42





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

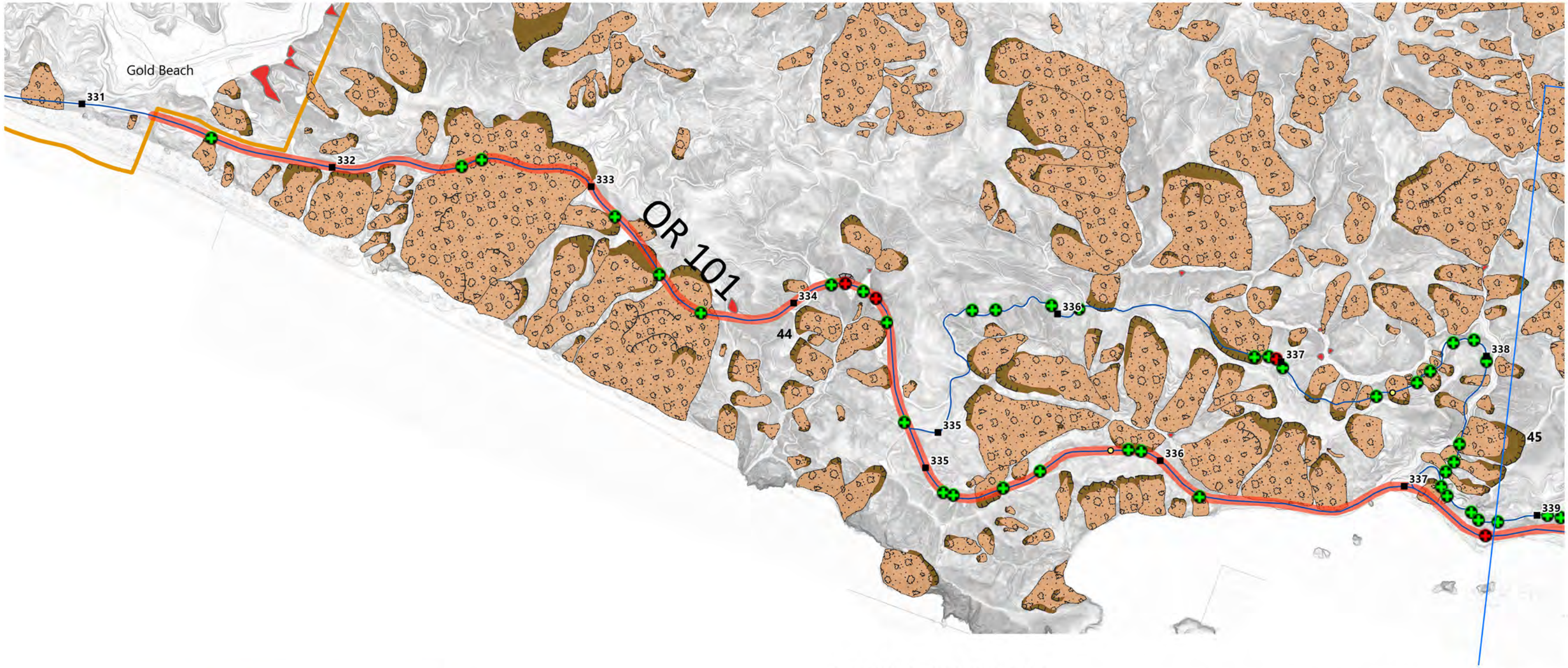
Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

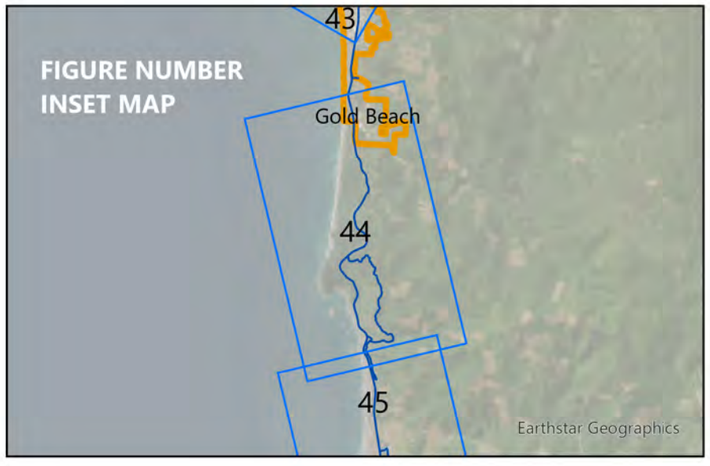
N 0 2,000 4,000 FT

GRI DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-F) PORT ORFORD TO GOLD BEACH

APR. 2024 JOB NO. 6897-A FIG. 43





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

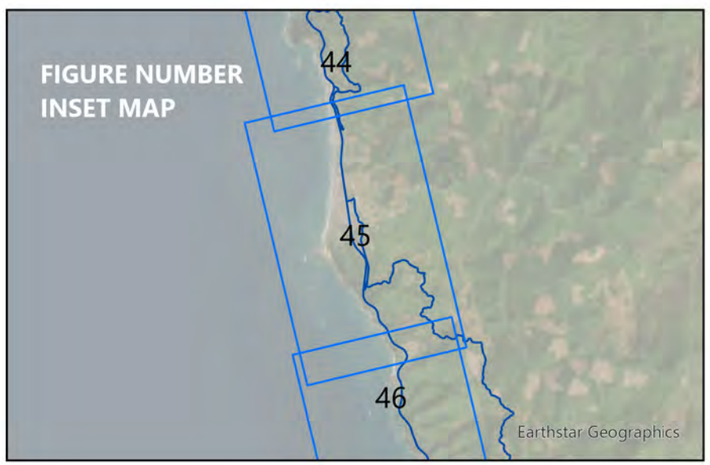
(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 44

OR 101

339 340 341 342 343 344 345 347

44 45 46



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

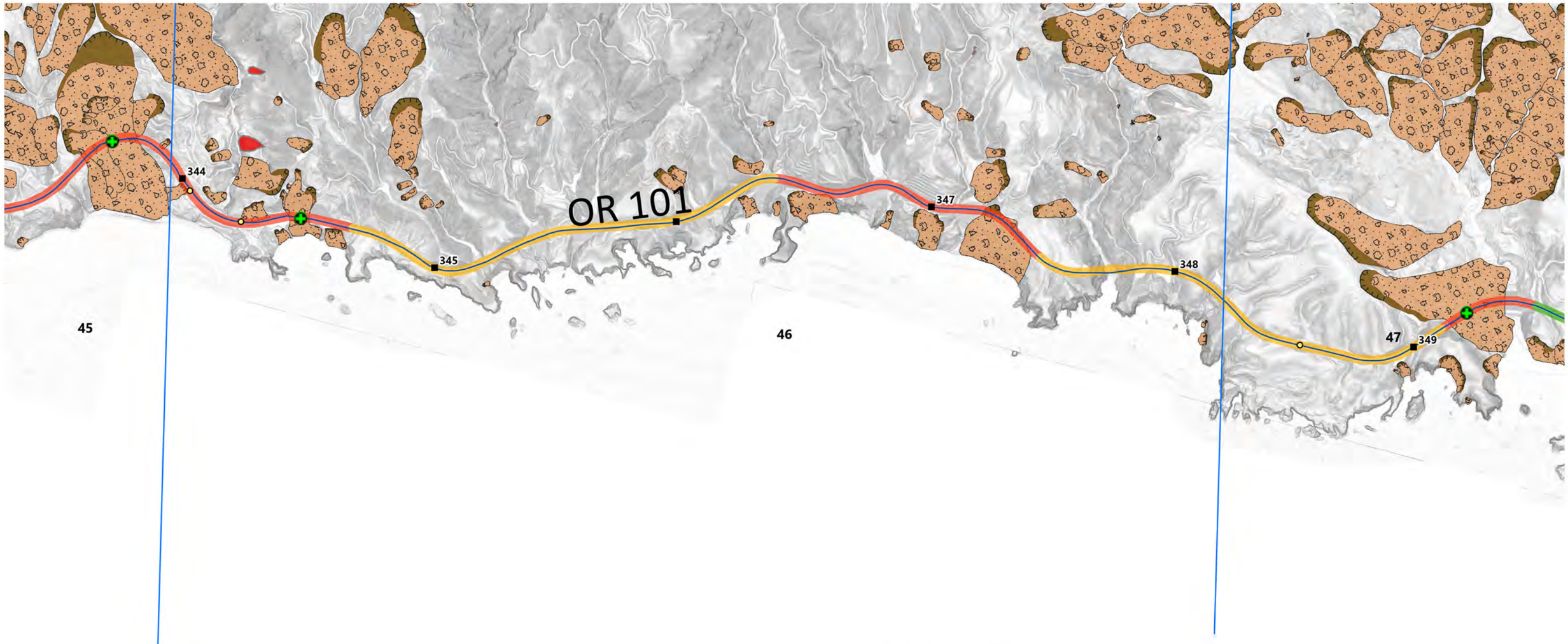
0 2,000 4,000 FT

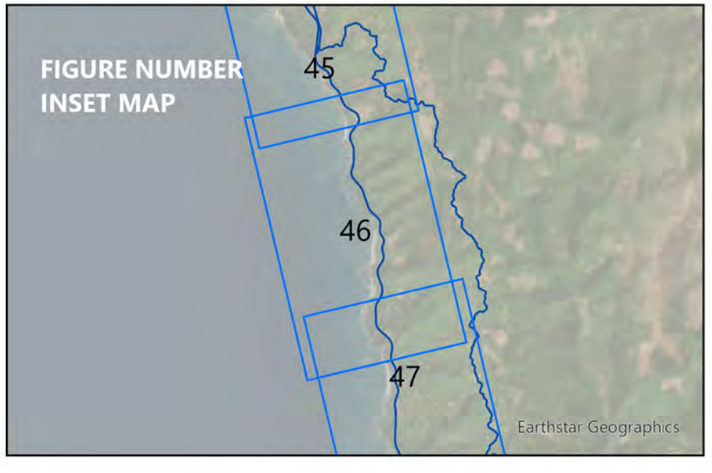
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 45





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

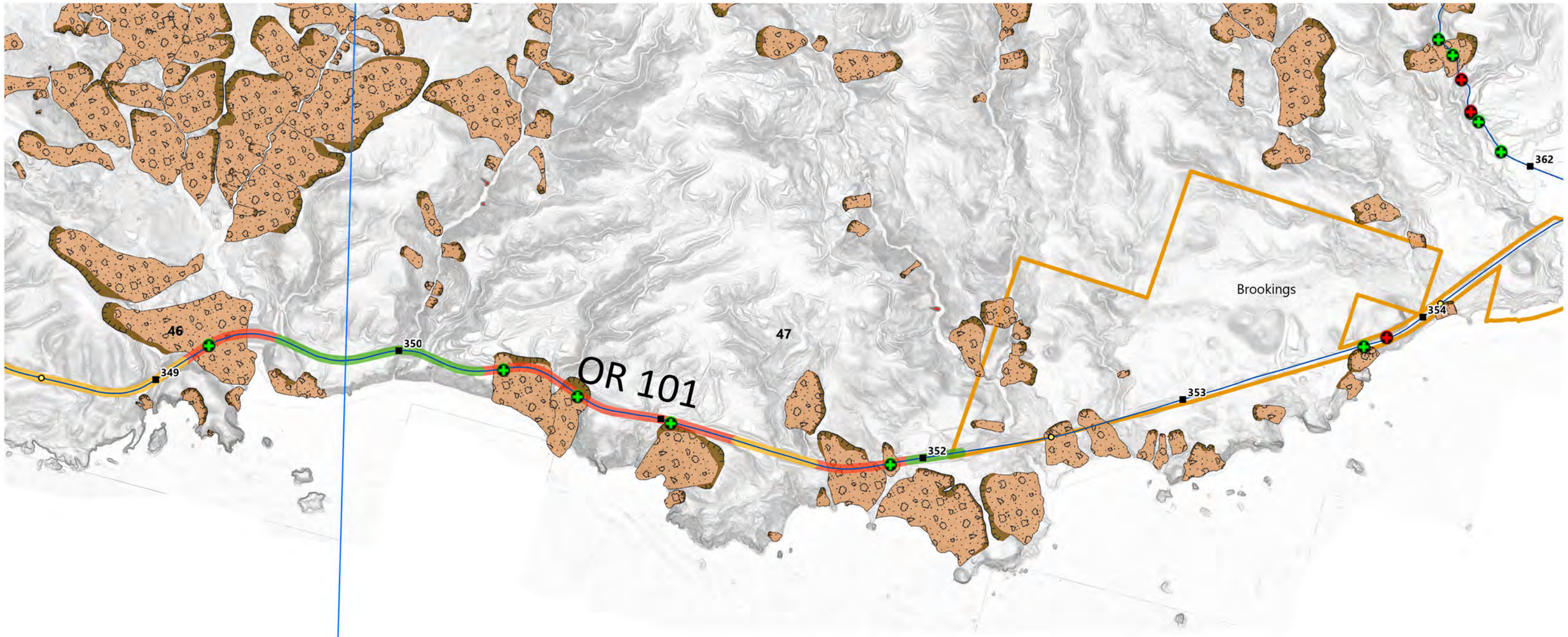
0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 46



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

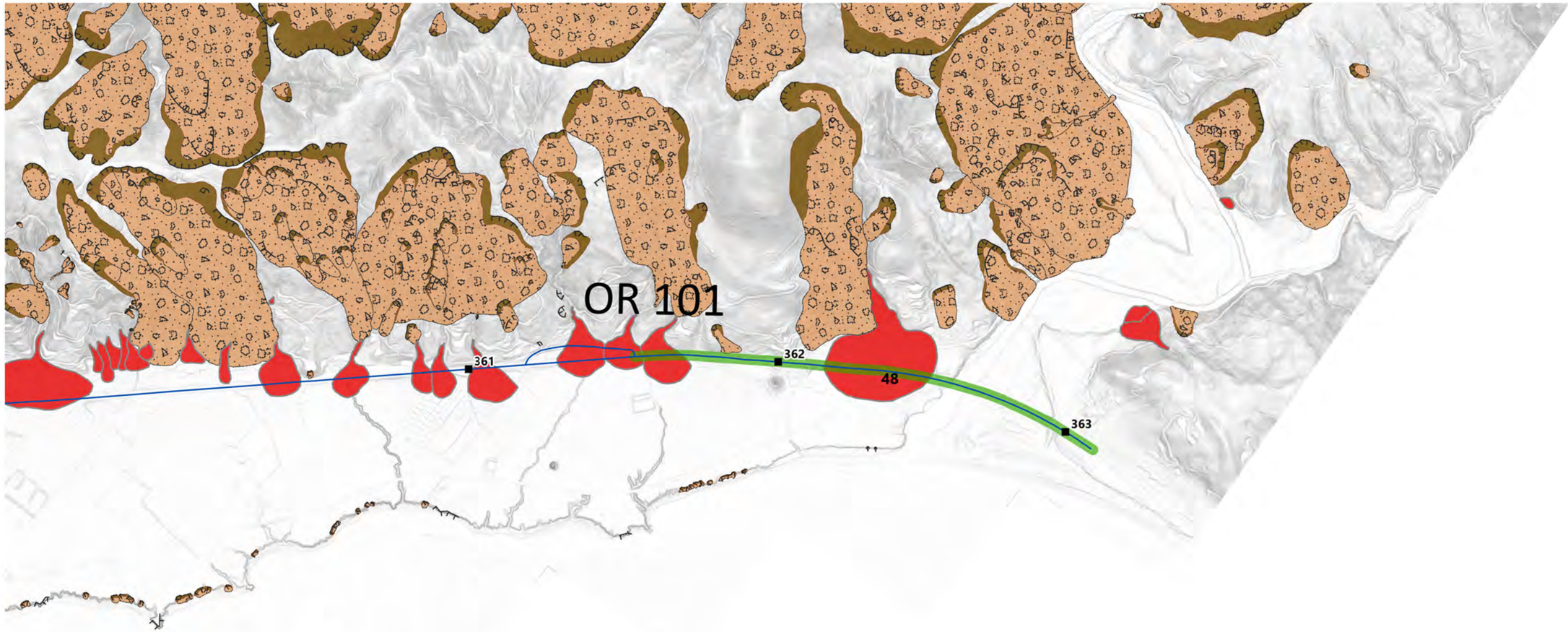
0 2,000 4,000 FT

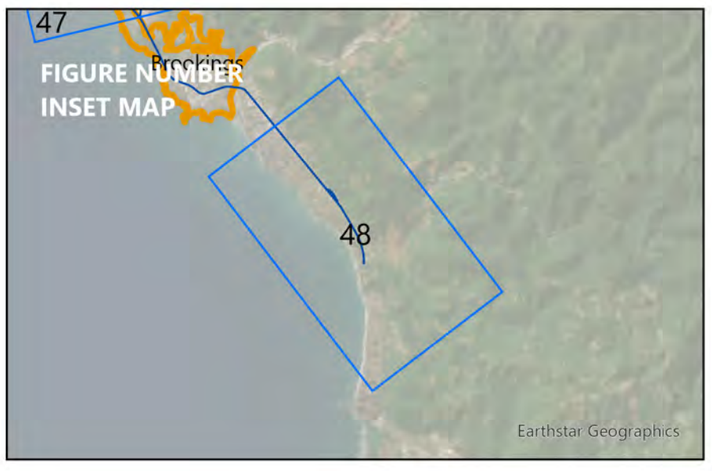
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-G) GOLD BEACH TO BROOKINGS

APR. 2024 JOB NO. 6897-A FIG. 47





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(101-H) BROOKINGS TO CA BORDER

APR. 2024 JOB NO. 6897-A FIG. 48

OR 42

Coquille

6

9

10

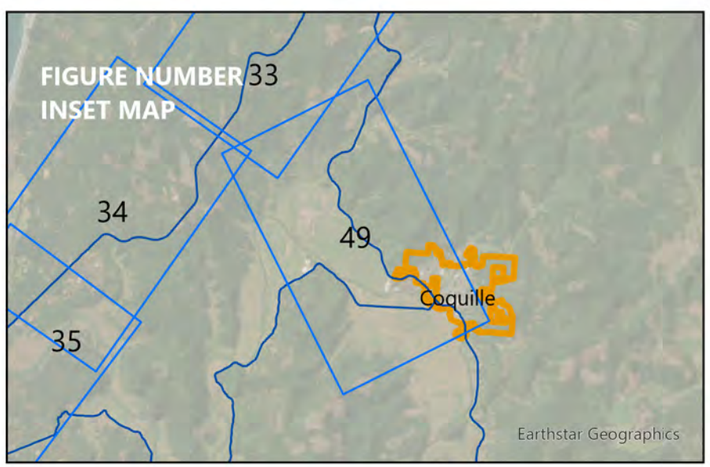
15

16

33

34

49



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-A) WEST OF COQUILLE

APR. 2024 JOB NO. 6897-A FIG. 49

Myrtle Point

21

22

50

OR 42

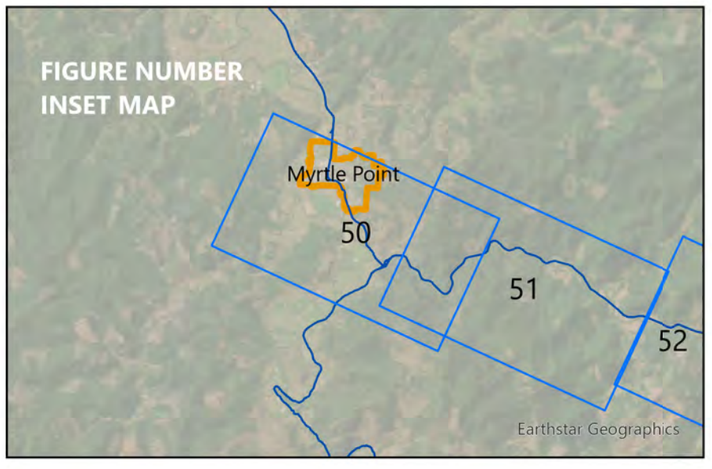
24

51

25

26

FIGURE NUMBER
INSET MAP



- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

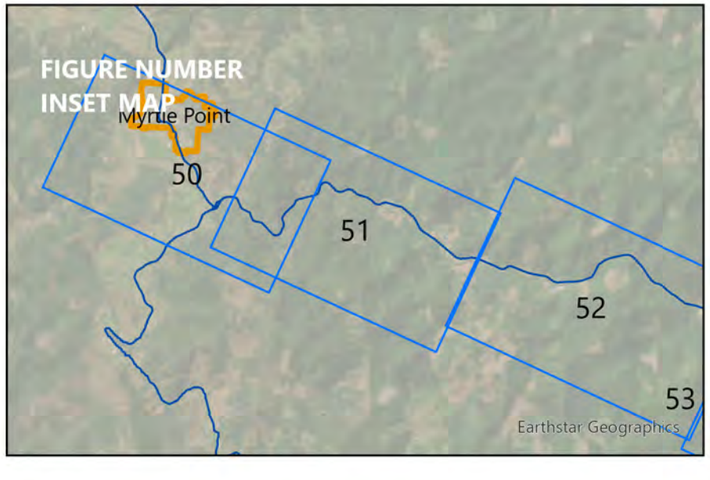
DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-B) MYRTLE POINT TO OR 542

APR. 2024 JOB NO. 6897-A FIG. 50

OR 42

24
25
26
27
29
30
31
50
51
52



■ ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

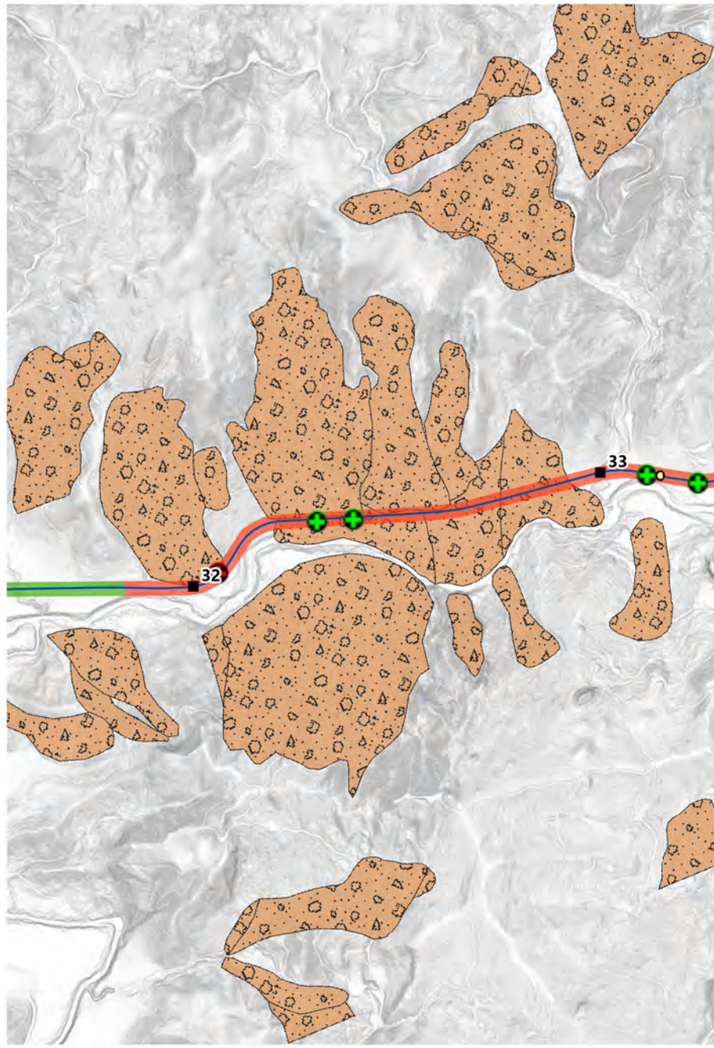
0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-B) MYRTLE POINT TO OR 542

APR. 2024 JOB NO. 6897-A FIG. 51



OR 42

32 33 34 36 37 38

52

■ ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

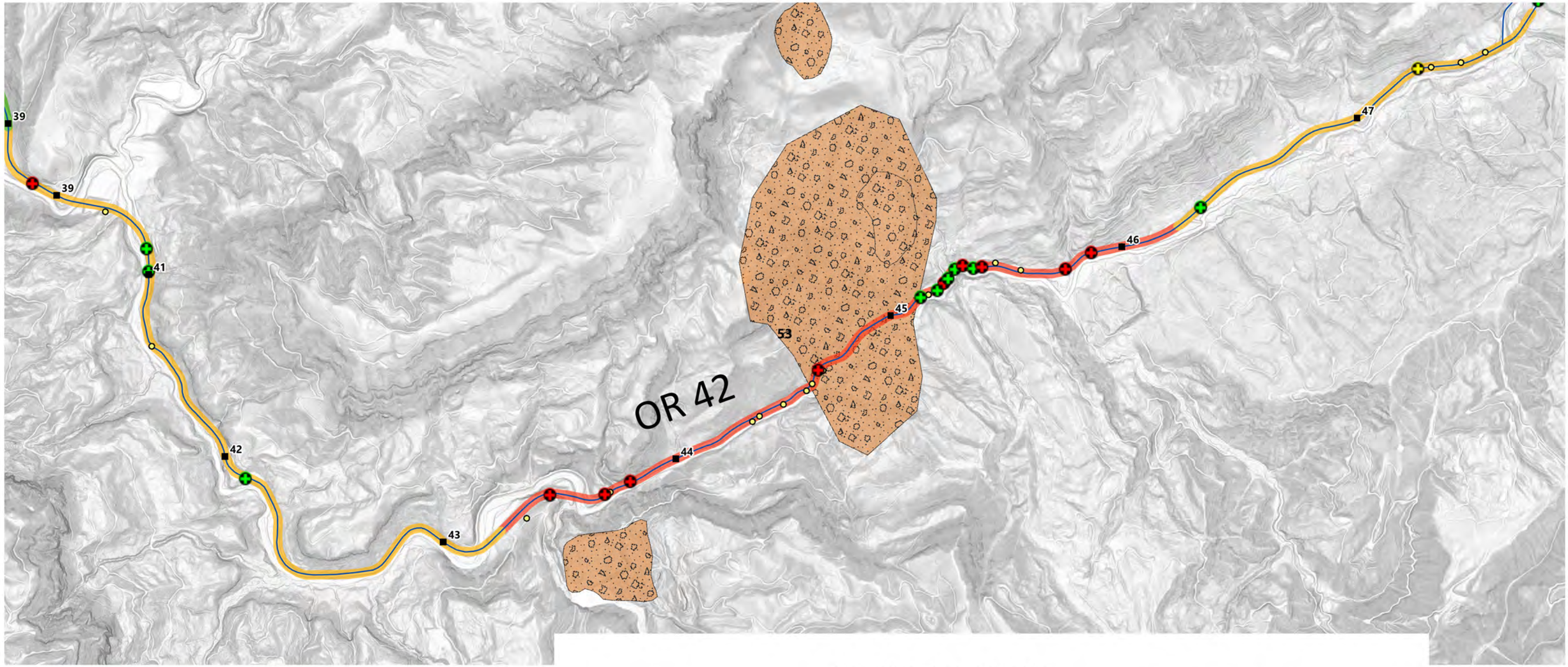
0 2,000 4,000 FT

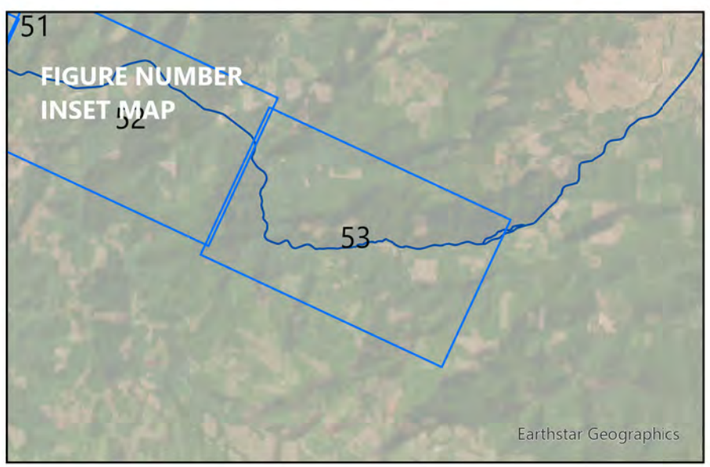
GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-C) OR542 JUNCTION TO OR 42 COUPLET

APR. 2024 JOB NO. 6897-A FIG. 52





- ODOT Mile Posts

Segments

Relative Hazard Assessment

- High Hazard
- Moderate Hazard
- Low Hazard

DOGAMI SLIDO DATABASE

- Historically Active Landslides
- Scarp
- Head Scarp

Deposits

- Talus-Colluvium
- Fan
- Landslide

ODOT Unstable Slopes Inventory

- High Activity
- Medium Activity
- Low Activity

Note: Relative hazards assessment information provided is for preliminary planning purposes only and is based on limited available information. A site evaluation based on field studies will be necessary to confirm site hazards and feasibility of roadway improvements.

N

0 2,000 4,000 FT

GRI

DKS ASSOCIATES
OR 42 AND US 101 PASSING LANES STUDY

(42-C) OR542 JUNCTION TO OR 42 COUPLET

APR. 2024 JOB NO. 6897-A FIG. 53

APPENDIX A

Geoprofessional Business Association Guidance Document

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org