Technical Memorandum

TO: Ryan Moore, P.E., Vector Engineering Inc.

FROM: Tom Briggs, P.E., LHg, and Lance Levine, P.E.

DATE: July 8, 2022

RE: **Hydrogeologic Evaluation**
Eagle Cliff Mine
Lewis County, Washington
Project No. 1403014.010

RECEIVED
August 17, 2022
Washington Geological Survey

Introduction

Vector Engineering Inc. (Vector) is currently providing engineering services for the Eagle Cliff Northwest, LLC (Eagle Cliff) Mine (mine), located at 451 Mandy Road in Toledo, Washington (Site). The mine is an active gravel pit located near the Cowlitz River that was originally permitted in 1992. The mine was purchased by Eagle Cliff and the associated Reclamation Permit was approved for transfer in 2012. Eagle Cliff is proposing to expand the active mining area from 20 to approximately 30 acres. As a result, Vector has engaged Landau Associates (Landau) to prepare a hydrogeologic assessment to evaluate potential impacts mine expansion and reclamation activities may have, if any, on local groundwater flow. This technical memorandum summarizes the site geologic and hydrogeologic setting, surrounding land use, mining operations, and proposed mining expansion and reclamation activities, and provides a general discussion of potential impacts mine expansion and reclamation may have on local groundwater flow. A vicinity map and site map are presented on Figures 1 and 2, respectively.

Land Use and Zoning

The Site is located within two parcels (Parcel No. 012524000000 and Parcel No. 012487002002) that total 56.95 acres and are zoned Agricultural Resource Lands by Lewis County's Geographic Information System (GIS) Web Map website (Lewis County, Accessed February 21, 2022). Adjacent properties to the north, south, east, and west are also zoned Agricultural Resource Lands, and parcels located along the Cowlitz River further to the northeast and west are zoned as Mineral Resource Lands. The area along the south side of the Cowlitz River that includes the Site is designated as a critical aquifer recharge area (Lewis County). Surrounding land use generally consists of rural residential and agriculture land, with what appears to be an active surface mine located approximately 0.4 mile west of the Site. The surrounding property is generally unpaved except for public roads and private drives. The nearest commercial development is located approximately 0.4 mile southeast of the Site, across US Interstate 5 (I-5).

A review of well logs available online at the Washington State Department of Ecology's (Ecology's) Washington State Well Report Viewer (Ecology, Accessed February 21, 2022) indicates the nearest domestic well is approximately 0.18 mile south of the Site. The Washington State Department of

Health (WDOH) Source Water Protection (SWAP) mapping program (WDOH 2020) identifies four Group B Public Water Systems in the vicinity of the Site. One system is for a well located at the Site, one system is located approximately 0.4 miles to the west on property containing a surface mine, and two systems are located approximately 0.4 miles to the south and southeast near I-5 (Figure 2). No wellhead protection areas for the Group B wells overlap, and no offsite wellhead protection areas extend to the Site.

Geologic and Hydrogeologic Setting

The Site is located along the Cowlitz River approximately 3.5 miles southwest of the town of Toledo. It lies within a region referred to as the West-Central Lowland, part of a structural and topographic basin that includes flood plains of the Cowlitz River (Weigle and Foxworthy 1962). The Cowlitz River has its origin in the glaciers, lakes, and streams on Mount Rainier and the Cascade Range to the east and northeast and drains approximately 1,300 square miles of Lewis County. The Cowlitz River flows west and southwest from its origins to the town of Vader, just west of the Site, then turns south where it continues approximately 25 miles to the Columbia River.

The Site sits at an elevation of approximately 80 feet (ft; North American Vertical Datum of 1988 [NAVD88]) and is bounded by the Cowlitz River to the north, northwest, and northeast, and to the south and southeast by Foster Creek and an elevated ridge that rises approximately 80 ft above the Site. Regional topography south of the Site slopes north to a flat bench along the south side of the Cowlitz River where the Site is located.

Surface geology, documented in the *Geologic Map of Washington Southwest Quadrant* (Walsh et al. 1987), accessed through the online *Washington Interactive Geologic Map* hosted by Washington Department of Natural Resources' Geology and Earth Resources Division *(*WDNR, Accessed February 21, 2022*)*, maps surface geology at the Site as quaternary unconsolidated or semi-consolidated alluvial clay, silt, sand, gravel and (or) cobble deposits. These deposits are locally underlain by deposits of siltstone and sandstone of the Cowlitz formation, which is present in outcrops immediately south of the Site and to the north across the Cowlitz River. The Cowlitz formation underlies much of the West-Central Lowland and is considered a dense, much less permeable unit than the upper unconsolidated deposits that border the Cowlitz River.

The U.S. Department of Agriculture Natural Resource Conservation Service (NRCS USDA) Web Soil Survey (USDA NRCS, Accessed February 21, 2022) classifies near surface soil at the Site as Newberg fine sandy loam, well drained, 0 to 3 percent slopes to a depth of 5 ft. The deeper portion of the unit, between 1.5 and 5 ft below ground surface (bgs), is characterized as containing approximately 84 percent sand, 9 percent silt, and 7 percent clay. Well logs on file with Ecology document topsoil within the upper 2 to 4 feet of the surface, underlain by a mixture of clay, sand, gravel, and boulders between 5 and 45 ft bgs, which are in turn underlain by a hard sandstone or shale, which is consistent

with the outcrops documented by WDNR near the Site. The well logs document depth to water within the upper 20 ft of the ground surface, which likely fluctuates seasonally and in response to changes in water levels in the Cowlitz River. The location of the domestic well logs on file with Ecology are shown on Figure 2,[1] and the well logs are included in Attachment 1.

Mine Operations

On January 26, 2022, Landau conducted a site reconnaissance to observe site conditions and mining activities, and to discuss the planned expansion and reclamation activities with the mine operator.

The mine is a gravel pit operated by L Rock Industries (LRI), which has mined alluvial sand and gravel alluvium in the area for over 25 years. LRI intends to expand the pit to the north and northeast by use of tracked excavator and skyline excavator methods. Eventually, the pit will also be expanded towards the southwest corner of the property.

A rock crusher and wash plant are located immediately southwest of the pit. The wash plant is supplied water from a groundwater well at the Site, presumably under the permit exemption statute (Revised Code of Washington 90.44.050). The wash plant discharges wash water, fine sand, and silt through a 12-inch-diameter corrugated pipe along the south portion of the pit. Except for the final 5 ft, the pipe is covered with material typically consisting of topsoil, silt, sand, and gravel that was brought to the site when clients picked up aggregate. As the discharged material from the wash plant accumulates in the pit, the discharge pipe is extended and covered, leaving the last 5 ft exposed. Additional pipe is anticipated to be added at a rate of approximately 40 to 60 ft per year. When the pipe approaches the southeast corner of the pit, the pipe extension will be reset along the south side of the pit. At the termination of the permit, the discharge pipe will be removed from the site. Reclamation will be minimal due to the ongoing mining operation.

Currently, LRI's mining operations extend down to approximately 30 ft bgs, to the top of a denser sandstone and interbedded siltstone unit of the Cowlitz Formation. LRI intends to continue mining gravel to this depth before considering deeper excavations to the permitted depth of 50 ft bgs. The LRI mine operator stated that the water level in the pit typically drops about 6 ft from the wet season water level highs to the dry season water level lows and indicated that the bottom of the Cowlitz River appears to be at approximately the same relative elevation as the bottom of the pit. A grain size analysis of a sample representative of the native gravel collected during the Site visit indicates the material classifies as a sandy fine to coarse gravel, with less than 1 percent silt. The grain size curve is included in Attachment 2.

[1] Well log locations are imprecise and are typically identified on a ¼ Section basis or using well addresses, where available. Ground surface elevations at well locations are estimated from Google Earth.

A large sewage septic system is located on the adjacent property east of the Site. This system services the Gee Cee's Truck Stop located approximately 0.6 mile south on Foster Creek Road and includes a drain field with a design rate of 14,500 gallons per day (gpd) (WDOH 2020).

Conceptual Site Model

The information discussed above describes relevant site features related to surface and subsurface conditions that can be used to develop a conceptual model of groundwater flow near the Site. The conceptual model illustrates the physical processes that control groundwater flow and provides a basis for understanding how changes in site features may impact hydrogeologic conditions.

Based on the information described above, shallow groundwater flow beneath the Site is interpreted to occur within the unconsolidated sand and gravel deposits that are present in the upper 30 to 50 ft of the ground surface. The presence of a denser siltstone/sandstone unit below may act as a less permeable boundary, which suggests that groundwater flow occurs primarily in the upper unit. Recharge to the Cowlitz River likely occurs from surface runoff and from the shallow groundwater flow during certain times of the year depending on seasonal groundwater and surface water levels; therefore, shallow groundwater flow beneath the Site is interpreted to flow northwest toward the Cowlitz River.

Due to its depth and location near the Cowlitz River, the mine pit and operations temporarily intercept groundwater flow within the upper unconsolidated deposits that would normally discharge directly to the Cowlitz River. The pit acts as a localized intermediate discharge point of both natural groundwater flow and groundwater pumped from the well for mine operations, which is illustrated by groundwater flow lines in the immediate vicinity of the mine pit being directed towards the pit (Figure 3). Groundwater flowing into the pit would then discharge out of the pit through its down gradient (generally northwestern) boundary, where it will continue to flow within the unconsolidated unit and discharge to the Cowlitz River. The impact of the pit on groundwater flow diminishes with distance away from the pit, as shown in Figure 3.

Impacts of Mine Reclamation and Expansion

Mine expansion is planned by extending the pit along the north, northeast, and southeast boundaries. The result would increase the pit area from approximately 20 to 30 acres, resulting in a larger water storage capacity for the pit. The increased storage capacity would likely result in additional groundwater flow toward the pit, which would then likely result in minor additional deflection of groundwater flow towards the pit. However, due to the permeable nature of the gravel deposits, and because the water level in the expanded pit area will be consistent with current water levels, impacts to groundwater flow from expansion are expected to be minor.

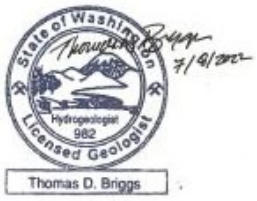
Mine reclamation includes the discharge of wash water and associated suspended fine material from the rock crusher and wash plant back into the pit via a 12-inch pipe, as shown in Figure 3. Due to the small percentage of fine material present in the sand and gravel mined from the pit, and because soil or rock will not be backfilled into the pit for reclamation, mine reclamation activities are not expected to restrict groundwater flow and are therefore not expected to have a substantive impact on local groundwater flow beyond what has been occurring historically.

USE OF THIS REPORT

This Technical Memorandum has been prepared for the exclusive use of Vector Engineering Inc. for specific application to the Eagle Cliff Mine Site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau makes no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.



Tom Briggs, PE, LHG
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Senior Geotechnical Engineer

TDB/LGL/BDL/kjg/kee
[\\OLYMPIA1\PROJECTS\1403\014.010\R\EAGLE CLIFF HYDROGEO EVALUATION_FINAL - REVISED 07082022.DOCX]

References

Ecology. Washington State Well Report Viewer. Washington State Department of Ecology. Available online at https://fortress.wa.gov/ecy/wellconstruction/Map/WCLSWebMap/default.aspx.

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Walsh, Timothy J., M.A. Korosec, W.M. Phillips, R. L. Logan, and H.W. Schasse. 1987. Geologic Map of Washington - Southwest Quadrant. Washington State Department of Natural Resources.

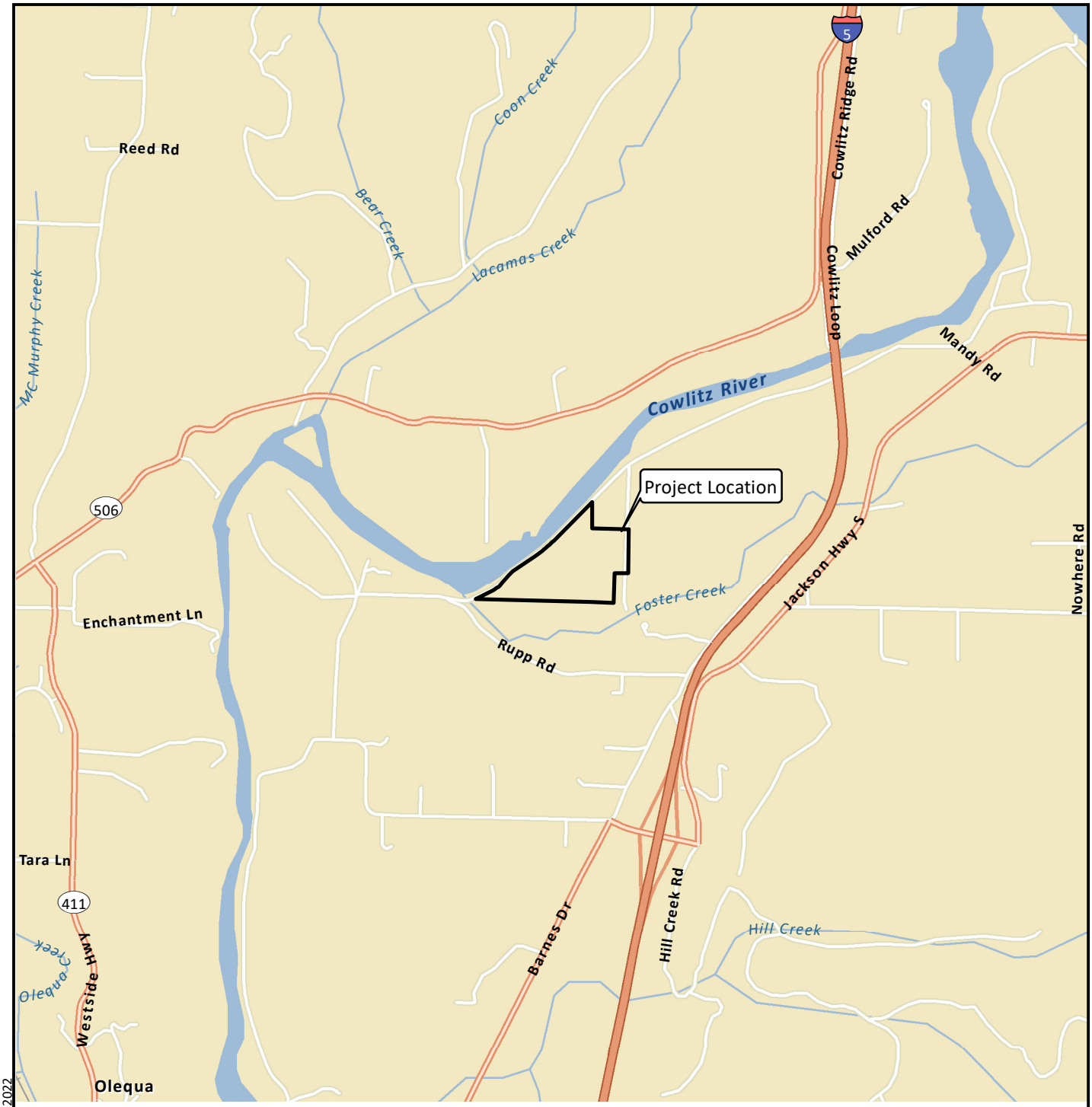
WDNR. Washington Interactive Geologic Map. Washington Department of Natural Resources. Available online at https://fortress.wa.gov/dnr/protectiongis/geology/?Theme=wigm.

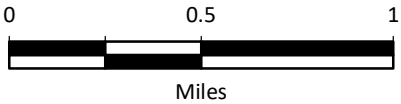
WDOH. 2020. Web Page: Source Water Assessment Program (SWAP) Mapping Application. Available online at https://fortress.wa.gov/doh/swap/index.html.

Weigle, J.M. , and B.L. Foxworthy. 1962. *Geology and Ground-Water Resources of West-Central Lewis County, Washington*. United States Geological Survey Water Supply Bulletin 17.

Attachments

Figure 1	Vicinity Map
Figure 2	Site Plan
Figure 3	Site Detail
Attachment 1	Select Well Logs
Attachment 2	Plot of Grain Size Analysis





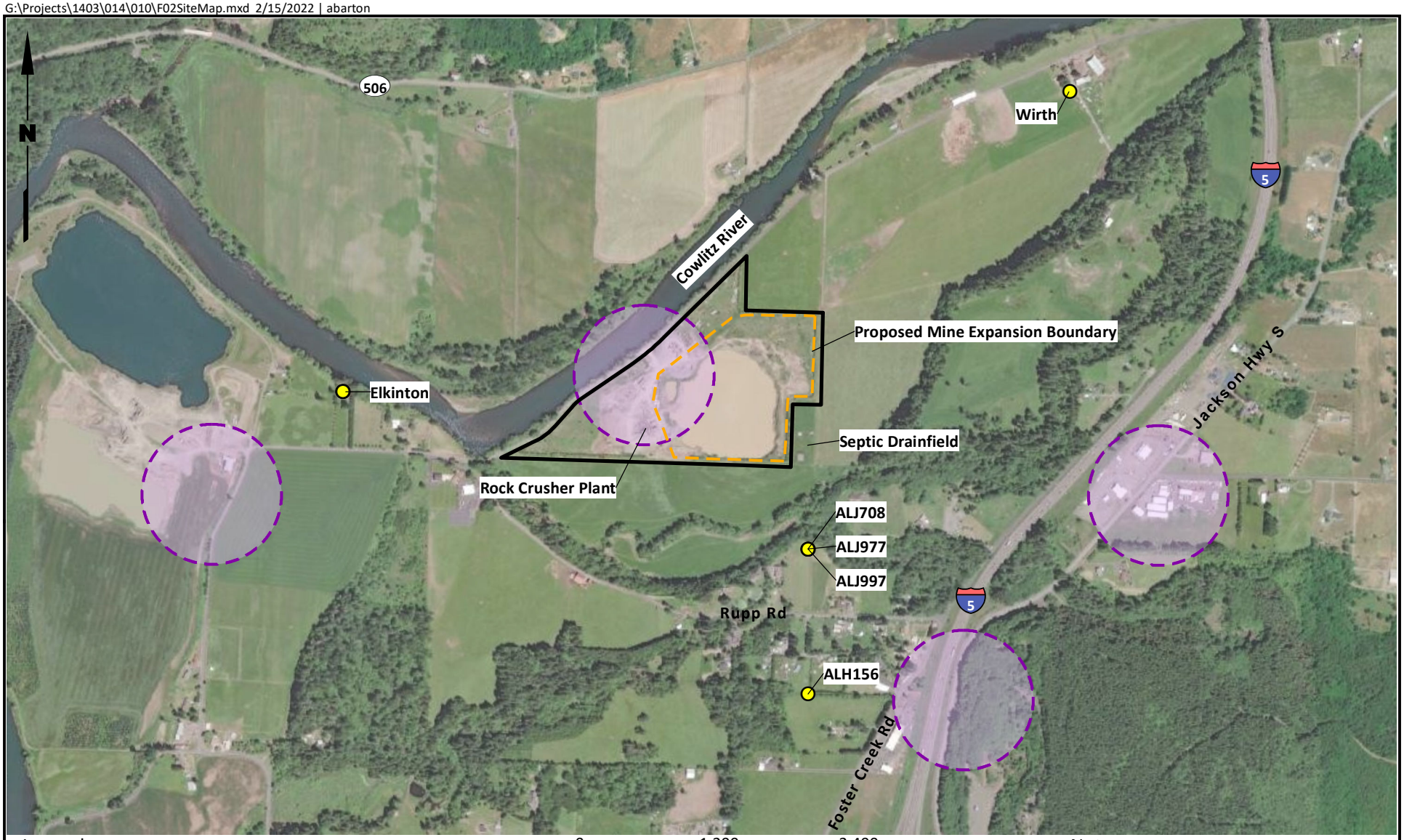
Data Source: Esri.

G:\Projects\1403\014\010\F01VicMap.mxd 2/14/2022

LANDAU ASSOCIATES

Eagle Cliff Mine Lewis County, Washington	**Vicinity Map**	Figure 1

G:\Projects\1403\014\010\F02SiteMap.mxd 2/15/2022 | abarton



Legend

- Domestic Wells
- Subject Property
- Proposed Mine Expansion Boundary
- Group B Wellhead Protection Areas

0 1,200 2,400

Scale in Feet

Data Sources: WDOH; Lewis County GIS; Esri World Imagery.

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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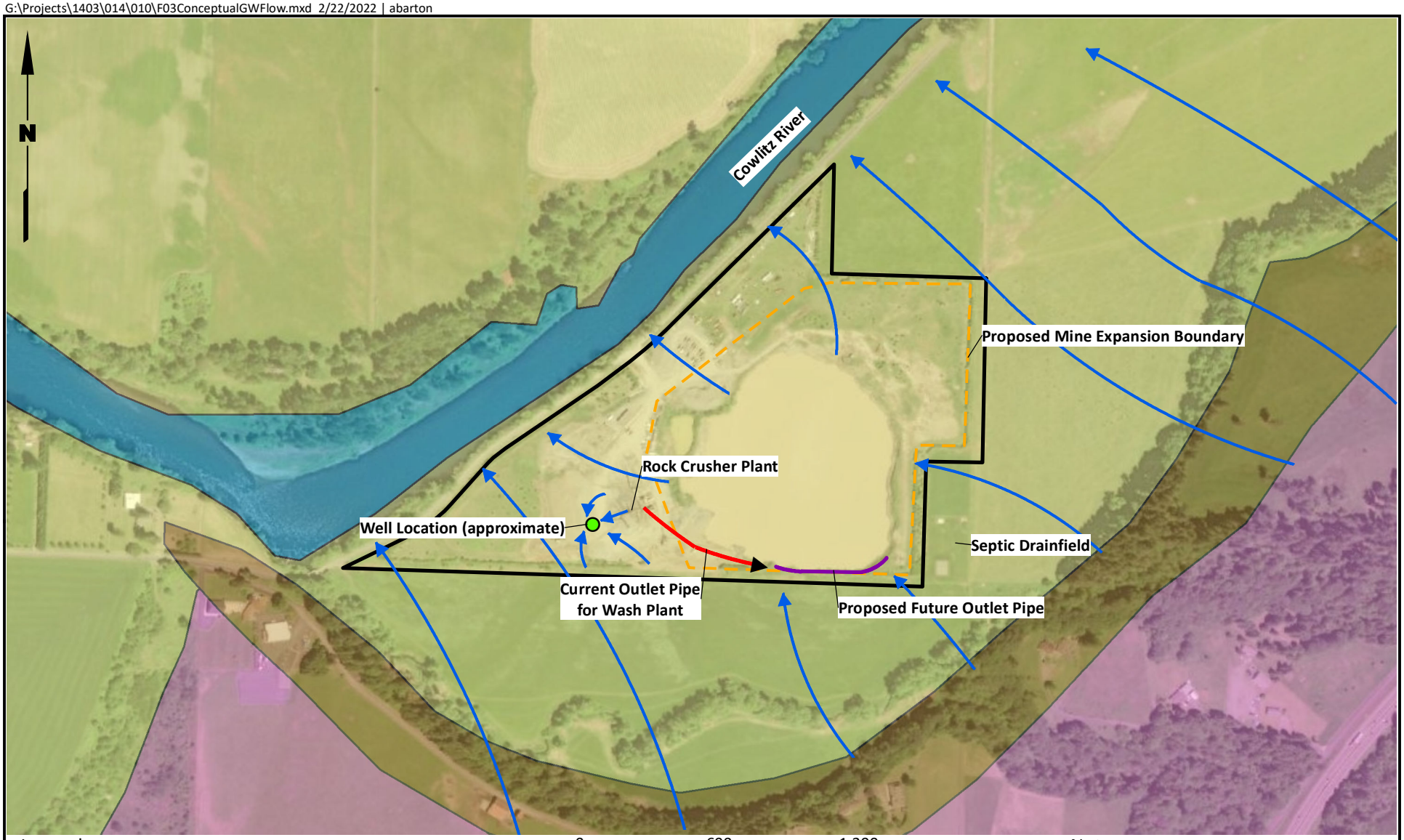
Eagle Cliff Mine
Lewis County, Washington

Site Map

Figure 2

G:\Projects\1403\014\010\F03ConceptualGWFlow.mxd 2/22/2022 | abarton



Legend

- Subject Property
- Proposed Mine Expansion Boundary
- Groundwater Flow Direction

Geology

- Alluvium
- Alpine Glacial Outwash, Pre-Fraser
- Nearshore Sedimentary Rocks
- Water

0 600 1,200

Scale in Feet

Data Sources: WADNR; Lewis County GIS; Esri World Imagery.

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Eagle Cliff Mine
Lewis County, Washington

Conceptual Model of Groudwater Flow

Figure 3

ATTACHMENT 1

Select Well Logs

WATER WELL REPORT

ECOLOGY Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Deconunission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number* 175029

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)

☒ New Well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6" inches, drilled 61 ft.
Depth of completed well 61 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 61 ft.
☐ Liner installed ____ Diam. from ____ ft. to ____ ft.
☐ Threaded ____ Diam. from ____ ft. to ____ ft.

Perforations: ☐ Yes ☒ No
Type of perforator used
SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location
Manufacturer's Name
Type Model No.
Diam. Slot Size from ft. to ft.
Diam. Slot Size from ft. to ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand
Materials placed from ft. to ft.

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft
Materials used in seal Bentonite-Hole plug
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

PUMP: Manufacturer's Name
Type: H.P.

WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 16 ft. below top of well Date 6-4-05
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (cap,valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after Ins.
Yield: gal./min. with ft. drawdown after Ins.

Recovery data (time taken as zero when pump turned offi(water level measuredfrom well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 30 gal./min. with stem set at 60 ft. for 2 lus.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

CURRENT **Notice of Intent No.** W-186088

Unique Ecology Well ID Tag No. AKR-708

Water Right Peffnit No.

Property Owner Name Randy Wallace

Well Street Address 241 A. Foster Ck. Rd.

City Toledo,Wa. County: Lewis

Location N.W. 1/4-1/4 N.W. 1/4 Sec 35 Twn 11 R 2W. EWM *circle or one* WWM

Lat/Long: (s,t,r still REQUIRED) Lat Deg Lat Nlin/Sec
Long Deg Long Nhn/Sec

Tax Parcel No.

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	2
Clay,Yellow	2	26
Sand & Gravel	26	61
W/Bearing 51-61		

RECEIVED
JUL 05 2005
Washington State Department of Ecology

Start Date 6-3-05 Completed Date 6-4-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Kenneth Williams

Driller/Engineerfrrainee Signature Kenneth Williams

Driller or Trainee License No. 1768

If **trainee, licensed driller's** Signature and License no.

Drilling Company Williams Well Drilling, Inc.

Address 957 Jackson Hwy. S.

City, State, Zip Toledo, WA 98591

Contractor's Registration No WILLIWD000KP Date 6/30/05

Ecology is an Equal Opportunity Employer.ECY 050-1-20 (Rev 4/01)

WATER WELL REPORT

ECOLOGY Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Deconunission *("x" in circle)* 312000

☒ Construction

☐ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number*_____

CURRENT **Notice of Intent No.** W-235540

Unique Ecology Well ID Tag No. ALH-156

Water Right Peffnit No. _____

Property Owner Name Randy Wallace

Well Street Address Near 153 Foster Creek Rd.

City Toledo County: Lewis

Location S.E. 1/4-1/4 N.W. 1/4 Sec. 35 Twn. 11N. R 2W.. EWM *circle or one* WWM

Lat/Long: (s,t,r still REQUIRED) Lat Deg _____ Lat Nlin/Sec _____ Long Deg _____ Long Nhn/Sec _____

Tax Parcel No. 012701005000

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other_____

TYPE OF WORK: Owner's number of well (if more than one)_____

☒ New Well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 8" inches, drilled 160 ft. Depth of completed well 160 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 8" Diam. from +2 ft. to 53 ft.

☒ Liner installed 6"P.V>C. Diam. from 40 ft. to 160 ft.

☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No

Type of perforator used Drilled

SIZE of perfs 9/16 in. by Round in. and no. of perfs 100 from 60 ft. to 120 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location_____

Manufacturer's Name_____

Type_____ Model No._____

Diam._____ Slot Size_____ from_____ ft. to_____ ft.

Diam._____ Slot Size_____ from_____ ft. to_____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand_____

Materials placed from_____ ft. to_____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 35 ft

Materials used in seal Bentonite--Hole Plug

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water?_____ Depth of strata_____

Method of sealing strata off_____

PUMP: Manufacturer's Name_____

Type:_____ H.P._____

WATER LEVELS: Land-surface elevation above mean sea level_____ ft.

Static level 35 ft. below top of well Date 7-24-08

Artesian pressure_____ lbs. per square inch Date_____

Artesian water is controlled by_____ (cap,valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level.

Was a pump test made? ☐ Yes ☒ No If yes, by whom?_____

Yield:_____ gal./min. with_____ ft. drawdown after_____ hrs.

Yield:_____ gal./min. with_____ ft. drawdown after_____ Ins.

Yield:_____ gal./min. with_____ ft. drawdown after_____ Ins.

Recovery data (time taken as zero when pump turned offi(water level measuredfrom well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test_____

Bailer test_____ gal./min. with _____ ft. drawdown after_____ hrs.

Airtest 15 gal./min. with stem set at 155 ft. for 1 lus.

Artesian flow_____ g.p.m. Date_____

Temperature of water_____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Fill	0	2
Clay, Yellow	2	31
Clay, Yellow W/Gravel Cemented	31	36
Gravel & Sand Some Water	36	40
Clay, Blue	40	46
Shale, Blue	46	58
Sandrock, Blue Water/Bearing 85-100	58	101
Shale, Blue Hard	101	160

RECEIVED

AUG 2 5 2008

Washington State Department of Ecology

Start Date 7-23-08 Completed Date 7-24-08

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Kenneth D. Williams

Driller/Engineerfrrainee Signature Kenneth Williams

Driller or Trainee License No. 1768

Drilling Company Williams Well Drilling Inc.

Address 957 Jackson Hwy. S,

City, State, Zip Toledo, Wa.

Contractor's Registration No. WilliWD000KP Date 8/21/08

If **trainee, licensed driller's** Signature and License no._____

Ecology is an Equal Opportunity Employer. ECY 050-1-20 (Rev 4/01)

487950

WATER WELL REPORT

ECOLOGY Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Deconunission *("x" in circle)*

☒ Construction
☐ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number*_____

CURRENT **Notice of Intent No.** W-2726665

Unique Ecology Well ID Tag No. ALJ-977

Water Right Peffnit No. _____

Property Owner Name Gail C. Wallace

Well Street Address 741 Foster Creek Rd.

City Toledo, County: Lewis

Location N.W. 1/4-1/4 N.W. 1/4 Sec 35 Twn 11N. R 2W.. EWM *circle or one* WWM

Lat/Long: (s,t,r still REQUIRED) Lat Deg _____ Lat Nlin/Sec _____ Long Deg _____ Long Nhn/Sec _____

Tax Parcel No. 12692-3

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other_____

TYPE OF WORK: Owner's number of well (if more than one)_____

☒ New Well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6" inches, drilled 52 ft.
Depth of completed well 52 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 52 ft.
☒ Liner installed 4.5P.V.C. Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No
Type of perforator used Holt-Air
SIZE of perfs 1/4 in. by 1 in. and no. of perfs 80 from 37 ft. to 42 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location_____
Manufacturer's Name_____
Type_____ Model No._____
Diam._____ Slot Size_____ from_____ ft. to_____ ft.
Diam._____ Slot Size_____ from_____ ft. to_____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand_____
Materials placed from_____ ft. to_____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft
Materials used in seal Bentonite-Hole Plug
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water?_____ Depth of strata_____
Method of sealing strata off_____

PUMP: Manufacturer's Name_____
Type:_____ H.P._____

WATER LEVELS: Land-surface elevation above mean sea level_____ ft.
Static level ~~40.5~~ 38.5 ft. below top of well Date 9-29-10
Artesian pressure_____ lbs. per square inch Date_____
Artesian water is controlled by_____ (cap,valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? ☐ Yes ☒ No If yes, by whom?_____
Yield:_____ gal./min. with_____ ft. drawdown after_____ hrs.
Yield:_____ gal./min. with_____ ft. drawdown after_____ hrs.
Yield:_____ gal./min. with_____ ft. drawdown after_____ hrs.

Recovery data (time taken as zero when pump turned off (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test_____
Bailer test_____ gal./min. with _____ ft. drawdown after_____ hrs.
Airtest 2.5 gal./min. with stem set at 42 ft. for 1 hrs.
Artesian flow_____ g.p.m. Date_____
Temperature of water_____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	2
Clay, Yellowish Brown	2	19
Clay, Yellow W/Gravel Cemented Hard	19	33
Sand, Brown Clay Binder	33	35
Clay, Yellow W/Gravel Cemented	35	37
Sand & Gravel Water/Bearing	37	42
Shalerock, Blue Med.	42	52

RECEIVED
DEC 17 2012
WA State Department of Ecology (SWRO)

Start Date 9-27-10 Completed Date 9-29-10

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Willie D. Williams

Driller/Engineer/trainee Signature _____

Driller or Trainee License No. 2470

Drilling Company Williams Well Drilling, Inc.

Address 957 Jackson Hwy. S.

City, State, Zip Toledo, WA 98591

Contractor's Registration No. WILLIWD000KP Date 10/23/10

If trainee, licensed driller's Signature and License no._____

448533

WATER WELL REPORT

ECOLOGY Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Deconunission *("x" in circle)*

☒ Construction
☐ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number* _____

CURRENT **Notice of Intent No.** W-277687

Unique Ecology Well ID Tag No. ALJ-997

Water Right Peffnit No. _____

Property Owner Name Gail Wallace

Well Street Address 241 Foster Creek Rd.

City Toledo, County: Lewis

Location N.W. 1/4-1/4 N.W. 1/4 Sec 35 Twn 11N. R 2W.. EWM *circle or one* WWM

Lat/Long: (s,t,r still REQUIRED) Lat Deg _____ Lat Nlin/Sec _____ Long Deg _____ Long Nhn/Sec _____

Tax Parcel No. 012692001001

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New Well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6" inches, drilled 40 ft. Depth of completed well 40 ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +2 ft. to 40 ft.
☒ Liner installed 4.5"P.V.C. Diam. from _____ ft. to _____ ft.
☐ Threaded _____ Diam. from _____ ft. to _____ ft.

Perforations: ☒ Yes ☐ No
Type of perforator used Holt-Air
SIZE of perfs 1/4 in. by 1 in. and no. of perfs 45 from 28 ft. to 31 ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot Size _____ from _____ ft. to _____ ft.
Diam. _____ Slot Size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft
Materials used in seal Bentonite - Hole Plug
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 23 ft. below top of well Date 4-10-12
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap,valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ Ins.
Yield: _____ gal./min. with _____ ft. drawdown after _____ Ins.

Recovery data (time taken as zero when pump turned offi(water level measuredfrom well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 4 gal./min. with stem set at 31 ft. for 1 lus.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Topsoil	0	1
Clay,Grey	1	3
Clay,Yellow W/Gravel Boulders Cemented	3	18
Clay,Yellow W/Gravel Cemented	18	27
Sand & Gravel Water Bearing	27	31
Clay,Blue,Gavel Cemented	31	33
Clay,Blue	38	40

RECEIVED
APR 19 2012
WA State Department of Ecology (SWRO)

Start Date 4-9-12 Completed Date 4-10-12

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Willie D. Williams

Driller/Engineer/Trainee Signature _____

Driller or Trainee License No. 2470

If **trainee, licensed driller's** Signature and License no. _____

Drilling Company Williams Well Drilling Inc.

Address 957 Jackson Hwy. S,

City, State, Zip Toledo,Wa.

Contractor's Registration No WilliWD000KP Date 4/16/12

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Virgil Elkinton Address 532 Mandy Rd, Toledo, Wash. 98591

(2) LOCATION OF WELL: County Lewis — S.E.¼ S.W.¼ Sec. 27 T. 11 N., R. 2 W.W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 30 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: NONE" Diam. from ..... ft. to ..... ft.
Threaded ☐ ....." Diam. from ..... ft. to ..... ft.
Welded ☐ ....." Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 0-30 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 0 ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: 0 gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 0 gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top Boil, Sandy Loam	0	4
Clay, Brown, Sandy	4	18
Gravel, W/Brown Clay	18	28
Clay, Blue	28	30

RECEIVED MAY 22 1987 DEPARTMENT OF ECOLOGY

Work started 5/6 19 87 Completed 5/6 19 87

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Williams Well Drilling Inc. (Person, firm, or corporation) (Type or print)

Address 957 Jackson Hwy. S. Toledo, Wash. 98591

[Signed] Mike Williams (Well Driller)

License No. 0525 Date 5/8 19 87

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Virgil Elkinton Address 532 Mandy Rd. Toledo, Wash. 98591

(2) LOCATION OF WELL: County Lewis S.E. ¼ S.W. ¼ Sec 27 T 11 N., R 2 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 30 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +1 ft. to 30 ft.
Threaded ☐ ." Diam. from ft. to ft.
Welded ☐ ." Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used Torch
SIZE of perforations 1/4 in. by 2 in.
25 perforations from 21 ft. to 24 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel: 3/8
Gravel placed from 20 ft. to 26 ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal ~~Neat~~ Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 12 ft. below top of well Date 5/7/87
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Air Date of test
~~Bailer~~ test 15 gal./min. with 12 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top Soil Sandy Loam	0	4
Clay, Brown, Sandy	4	16
Gravel W/Yellow Clay	16	21
Gravel & Sand W/Bearing	21	24
Clay, Blue	24	30

RECEIVED
JUN 22 1987
STATE OF WASHINGTON
DEPT. OF ECOLOGY

Work started 5/6 19 87 Completed 5/7 1987

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Williams Cell Drilling Inc.
(Person, firm, or corporation) (Type or print)

Address 957 Jackson Hwy S. Toledo, Wash. 98591

[Signed] (Well Driller)

License No. 0525 Date 5/8 19 87

(USE ADDITIONAL SHEETS IF NECESSARY)

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Virgil Elkinton Address 532 Mandy Rd. Toledo, Wash. 98591

(2) LOCATION OF WELL: County Lewis — S.E. ¼ S.W. ¼ Sec 27 T 11 N., R 2 W.W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 58 ft. Depth of completed well 58 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" " Diam. from +1 ft. to 38 ft.
Threaded ☐ 5" " Diam. from ..... ft. to ..... ft.
Welded ☒ P.V.C. Diam. from 30 ft. to 58 ft.

Perforations: Yes ☒ No ☐
Type of perforator used Drilled
SIZE of perforations 3/4 in. by Round in.
30 perforations from 40 ft. to 50 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Bad Iron Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 25 ft. below top of well Date 5/6/87
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: 8 gal./min. with 25 ft. drawdown after 1 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Air Bailer test 8 gal./min. with 25 ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top Soil Sandy Loam	0	5
Clay Brown, Sandy	5	16
Gravel W/Yellow Clay	16	26
Clay, Brown	26	28
Clay, Blue	28	35
SandRock, Blue	35	40
Sandstone, W/Bearing	40	55
Shale, Blue	55	58

RECEIVED JUN 22 1987 WATER RIGHTS

Work started 5/6 1987 Completed 5/6 1987

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Williams Well Drilling Inc.
(Person, firm, or corporation) (Type or print)

Address Toledo, Wash. 98591 957 Jackson Hwy. S

[Signed] Dave Williams
(Well Driller)

License No. 0525 Date 5/9, 19 87

(USE ADDITIONAL SHEETS IF NECESSARY)

WATER WELL REPORT
State of Washington

Start Card No. 41070
Water Right Permit No.

(1) OWNER: Dan Wirth Address: 886 Jackson Hyw. S. Toledo, Wash. 98591

(2) LOCATION OF WELL: County Lewis 1/4, 1/4, Sec. 26 ,T 11 R 02W WM.
(2a) STREET ADDRESS OF WELL: (or nearest address)

(3) PROPOSED USE: Domestic

(4) TYPE OF WORK: New Owner's number of well (if more than one)
Method: Air rotary

(5) DIMENSIONS: Diameter of well: 6 inches
Drilled 55 ft. Depth of completed well: 55 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +1 ft. to 54 ft.
" Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations:
Type of perforator used: No
Size of perforations: in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: No
Manufacturer's name:
Type: Mod. No.
Dia. slot size: from ft. to ft.
Dia. slot size: from ft. to ft.

Gravel packed: No Size of gravel:
Gravel placed from: ft. to ft.

Surface seal: Yes To what depth: 20
Material used in seal: Bentonite
Did any strata contain unusable water? No
Type of water: Depth of strata:
Method of sealing strata off:

PUMP: Manufacturers name:
Type: Size: H.P.:

(8) WATER LEVELS: Land-surface elevation above mean sea level: ft.
Static level: 19 ft. below top of well Date: 10-4-93
Artesian pressure: lbs. per sq. in. Date:
Controlled by:

9) WELL TESTS: Drawdown is amount water level is lowered below static water level.
Was a pump test made? No If yes, by whom:
Yield: GPM with ft. drawdown after hrs.
GPM with ft. drawdown after hrs.
Date of test: / /
Bailer test: GPM w/ ft. drawdown after hrs.
Air test: 100 GPM w/stem set at 50 ft. for 1 hrs.
Artesian flow: GPM Temp: o Chemical analysis: No

(10) WELL LOG

MATERIAL	FROM	TO
Topsoil	0	2
Clay, Brown	2	10
Clay & Gravel W/Few Boulders	10	30
Sand & Gravel, Yellow	30	42
Clay, Blue	42	44
Blue, Sand & Gravel W/B	44	55

Work Started: 10-1-93 Completed: 10-4-93

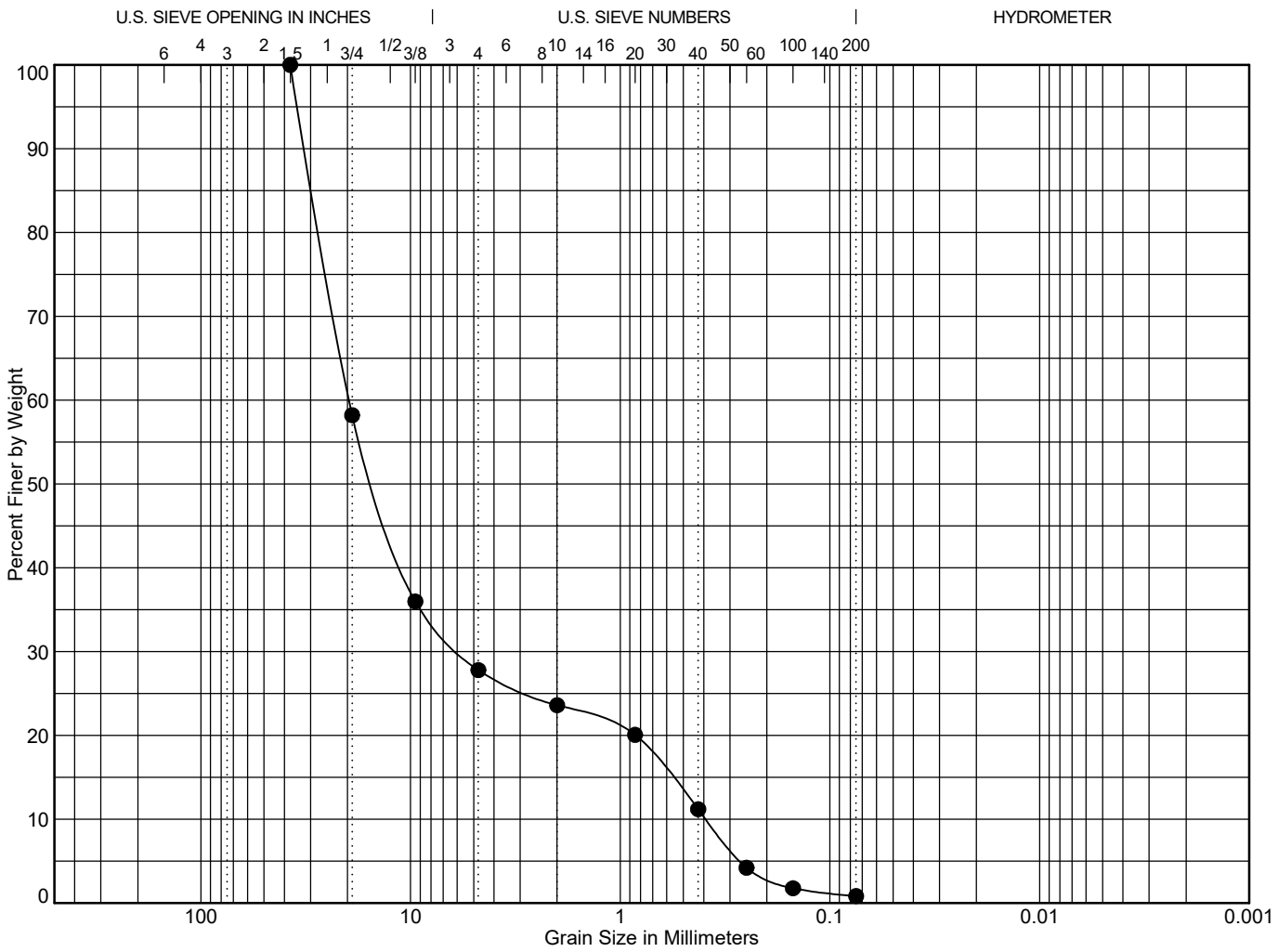
WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to the best of my knowledge and belief.

NAME: WILLIAMS WELL DRILLING, INC.
ADDRESS: 957 Jackson Hwy. So.
Toledo, Wa. 98591 Phone: 864-2951

[Signed] Kenneth D. Williams
License No. 1768 Date: 10-5-93
Cont. Reg. No. WILLIWD251R3

ATTACHMENT 2

Plot of Grain Size Analysis



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point	Depth	Classification	LL	PL	PI	C_c	C_u
● TP-1	5.0	Sandy, fine to coarse GRAVEL (GP)				4.32	50.39

Point	Depth	D_{100}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
● TP-1	5.0	37.5	19.565	14.713	5.727	0.388	41.8	30.4	4.2	12.4	10.4	0.8

$C_c = D_{30}^2/(D_{60} * D_{10})$

$C_u = D_{60}/D_{10}$

To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

1403014.01 2/16/22 Y:\14003\014.010\T\14003014.010.GPJ GRAIN SIZE W/STATS

LANDAU ASSOCIATES

Eagle Cliff Mine
Lewis County, Washington

Grain Size Test Data

Figure
A-2