Groundwater to Storage Application
Well Location Map
Tax Lots 200 and 2800

Located in SE-SE Qtr-Qtr of Section 10 and in SW-NE Qtr-Qtr & NE-SE Qtr-Qtr of Section 15 and in NW-NW of Section 22, T.11S., R.20E., W.M. Wheeler County, Oregon

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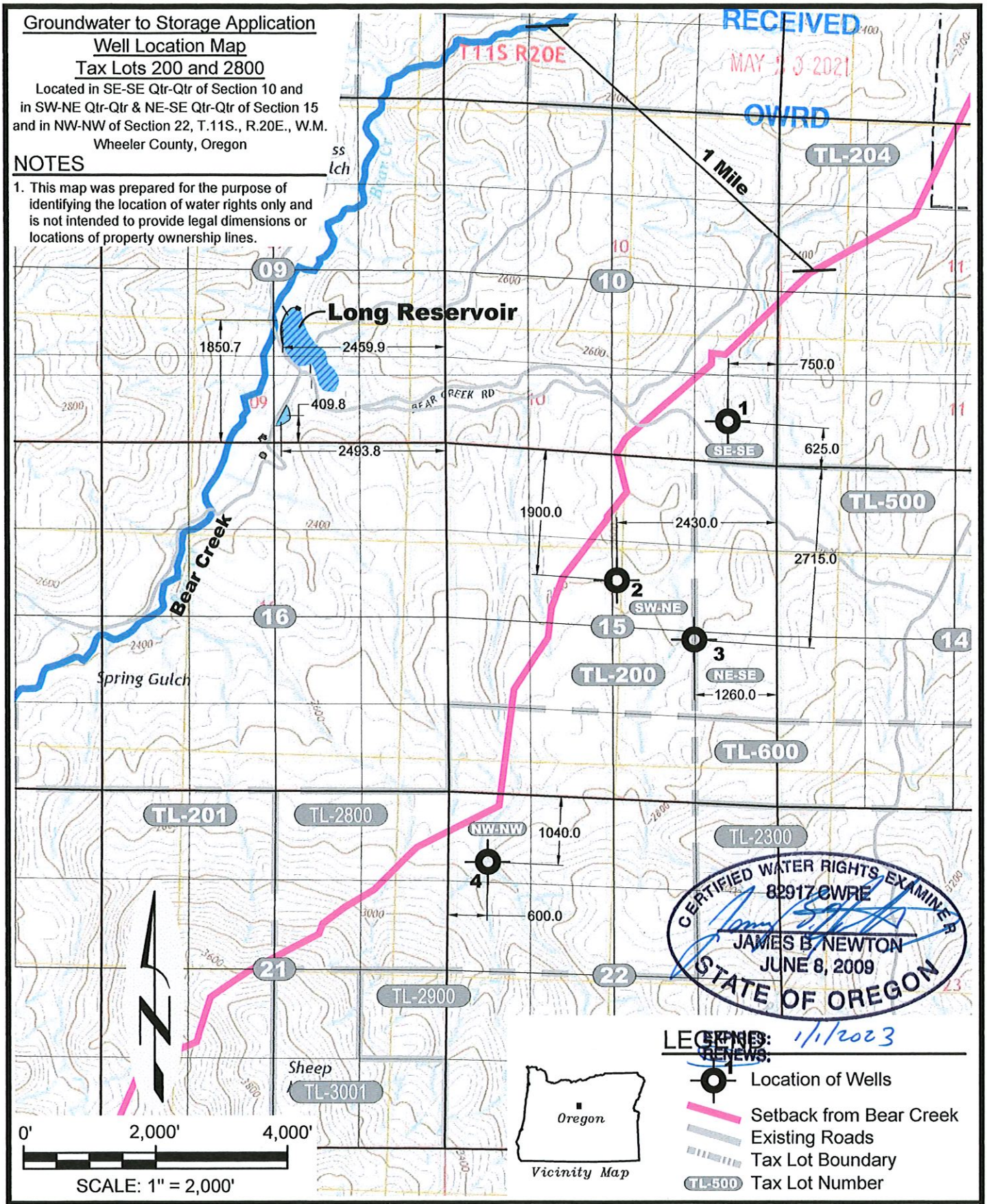
NOTES

1. This map was prepared for the purpose of identifying the location of water rights only and is not intended to provide legal dimensions or locations of property ownership lines.



CERTIFIED WATER RIGHTS EXAMINER
82917 OWRE
JAMES B. NEWTON
JUNE 8, 2009
STATE OF OREGON
EXPIRES: 1/1/2023
RENEWS:

LEGEND:

- 1 Location of Wells
- Setback from Bear Creek
- Existing Roads
- Tax Lot Boundary
- TL-500 Tax Lot Number

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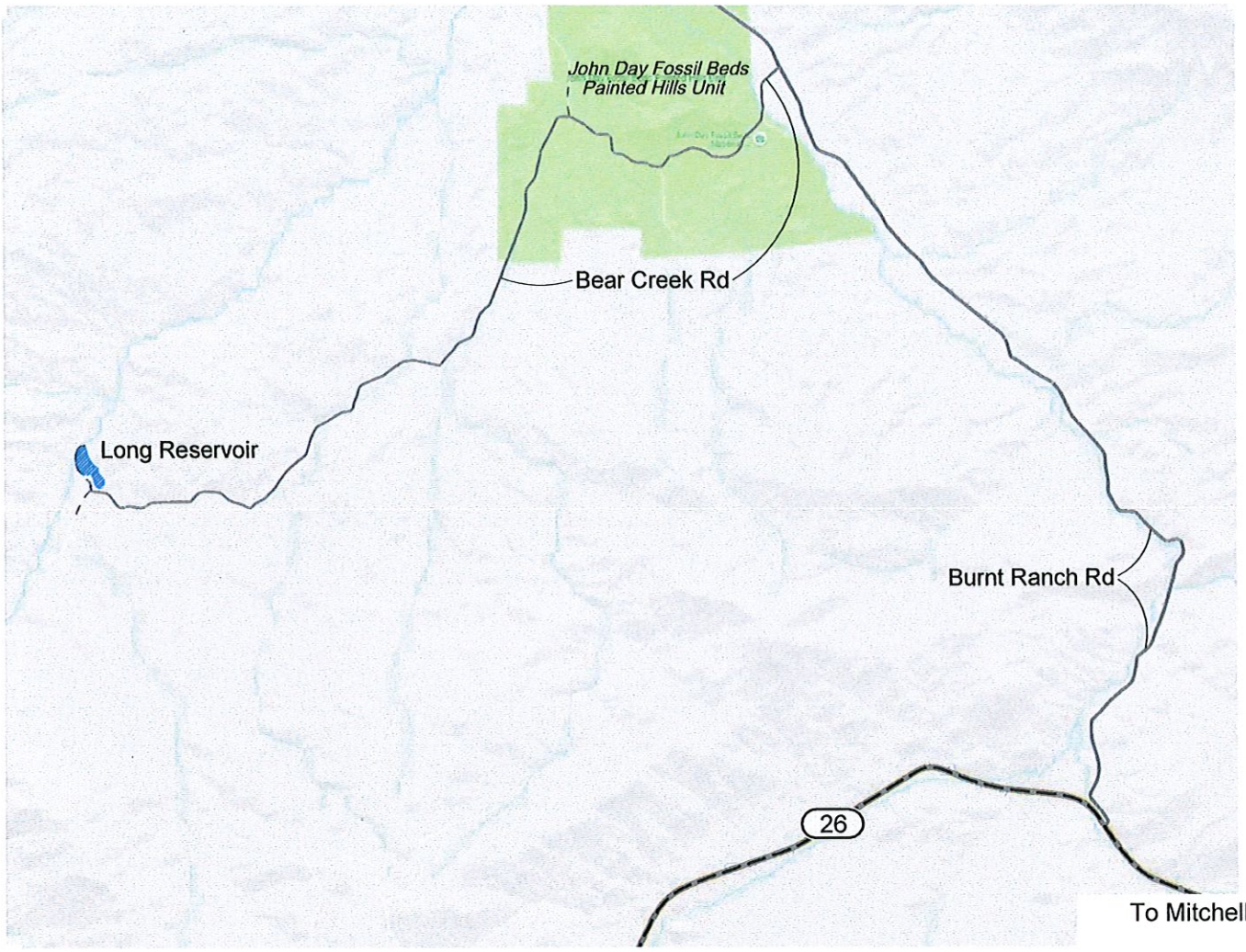
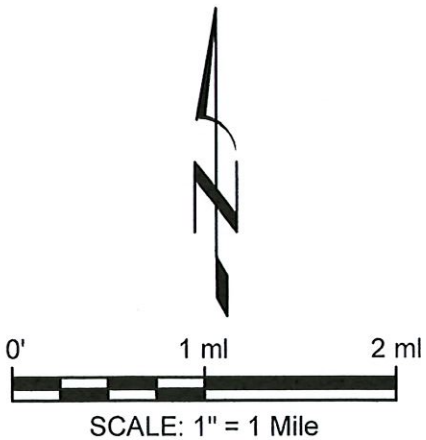
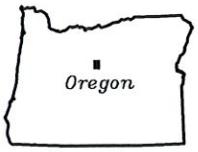
Proposed POA-Well Location Map
Groundwater to Storage Application - Long Reservoir
Wheeler County, Oregon

DESIGNED BY:	DRAWN BY:	DATE:	PROJECT NO.	FIGURE
J. Newton	R2D	APRIL 2021	CG 1000-104	2







Base Map:
Google Internet Map

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Vicinity Map
Groundwater to Storage Application - Long Reservoir
Wheeler County, Oregon

DESIGNED BY:	DRAWN BY:	DATE:	PROJECT NO.	FIGURE
J. Newton	R2D	APRIL 2021	CG 1000-104	1

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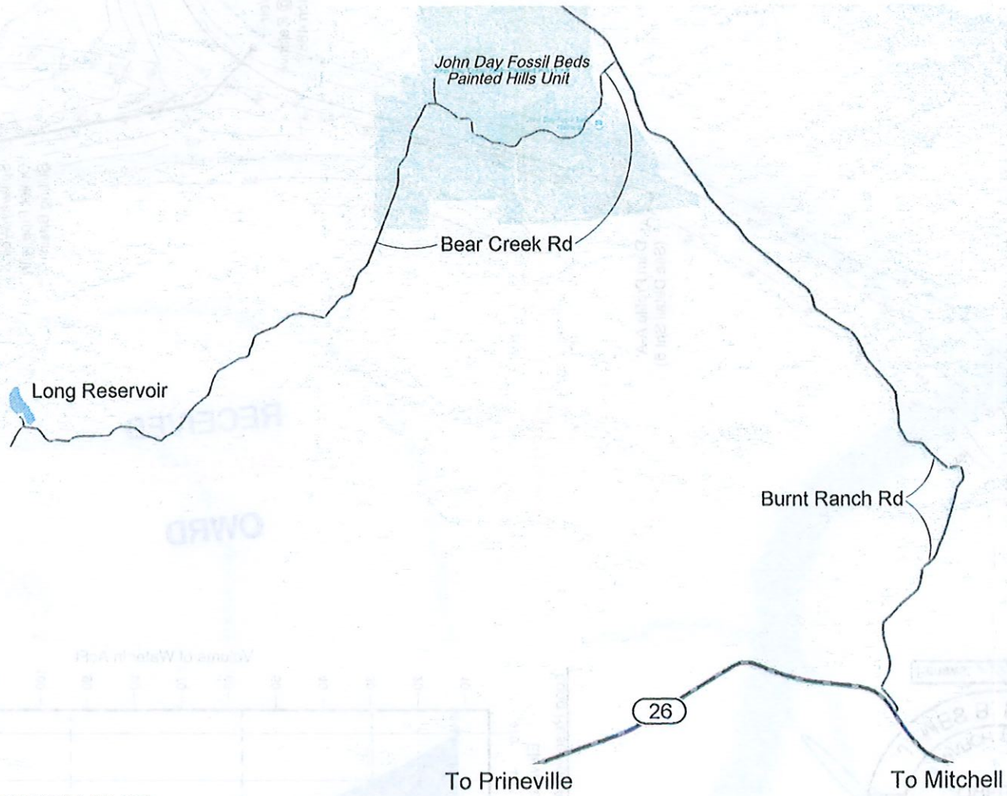
~ Long Reservoir Dam Project ~

Canyon Properties, LLC

June 2020



VICINITY MAP

Scale 1" = 1 Mile

SHEET INDEX

REGISTERED PROFESSIONAL ENGINEER
82917
OREGON
MARCH 15, 2017
JAMES B. NEWTON
Renews: 12/31/2021

PREPARED BY:

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PATH: F:\CG_Projects\CG-1000 TLong\104\CG1000_104_S1_Cover 11:23 06/11/2020 SC

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Stilling Basin
(See Detail Sht)

5% Slope

Proposed
Emergency
Spillway Weir &
Outlet Pipe with
Stilling Basin

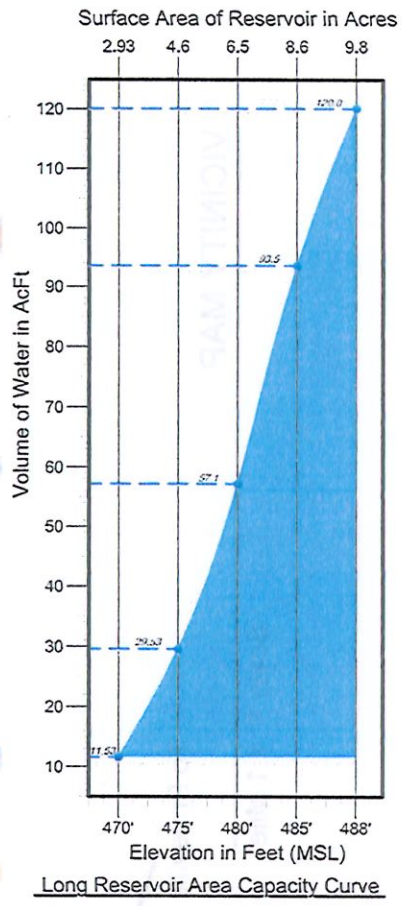
Primary Outlet
Concrete Encased
8.0" PVC (Sch 35/40)
Pipe

Inlet Weir
Plate @ Relative
Elevation 488'

Estimated
In-Water
Contours

A' Dam Profile A-A'
(See Detail Sht 5)

12" PVC Reservoir
Inflow Diversion Pipe



Long Reservoir Area Capacity Curve

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82917
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0' 100' 200'
SCALE: 1" = 100'

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Existing Dam Site

Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

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J. Newton	R2D	JUNE 2020	CG 1000-104	

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T11S R20E

Pass Gulch

Spillway
Primary Outlet
Dam Structure
L= 1,293'

Tax Lot 200

Long Reservoir Area of Use
Reservoir Area of Inundation
Elevation 2,269.5'
Volume: 23 AcFt
Surface Area: 120 Ac Ft
11.70 Ac

Un-Named Road

Red Scar Knoll

JOHN DAY F

John Day Fossil Beds National Monument

Adjustable Sluice Gate at POD #2 Diversion

Fish Screen

Spring Gulch

OWRD Peak Discharge Estimation Mapping Tool (2.30 Square Miles Watershe			
Return Period	Peak Flow	95% Confidence Limit	
(years)	(cfs)	Lower Limit (cfs)	Upper Limit (cfs)
2	3.96	1.42	10.96
5	6.21	2.51	15.39
10	7.96	3.29	19.28
20	9.75	4.03	23.60
25	10.35	4.25	25.13
50	12.25	4.96	30.20
100	14.24	5.64	36.06
500	19.17	7.07	52.12

Long Reservoir Watershed
1,475 Acres
2.30 Sq. Miles

Sheep Mtn

T11S R20E

Lawson Mountain

Cougar

HWY

0' 2,000' 4,000'

SCALE: 1" = 2,000'

JAMES B. NEWTON
OREGON
MARCH 15, 2017
Renews:
REGISTERED PROFESSIONAL ENGINEER
82917

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Watershed Map

Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

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J. Newton	R2D	JUNE 2020	CG 1000-104	SHEET 3 OF 7

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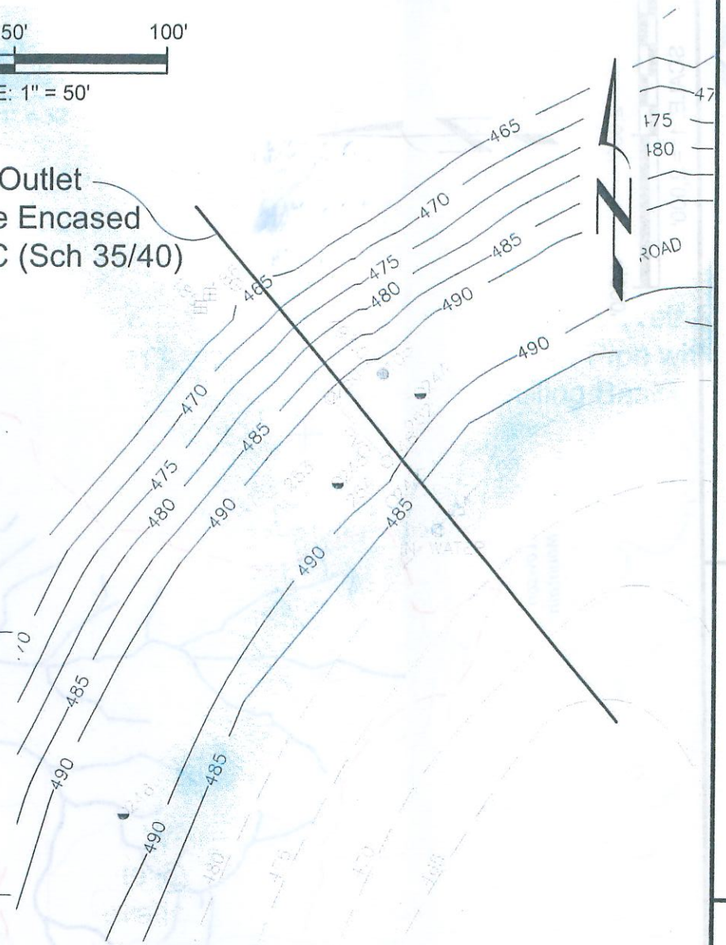
0' 50' 100'
SCALE: 1" = 50'

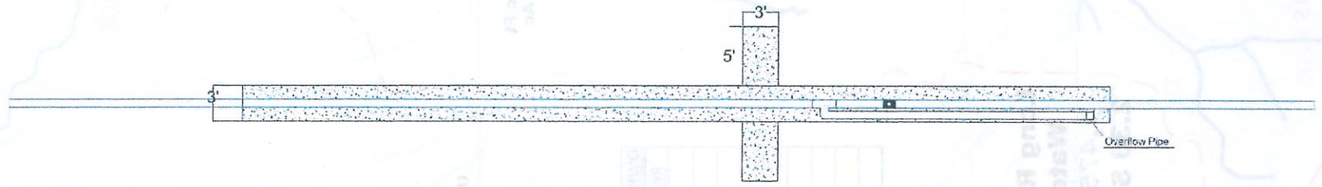
Primary Outlet
Concrete Encased
8.0" PVC (Sch 35/40)
Pipe



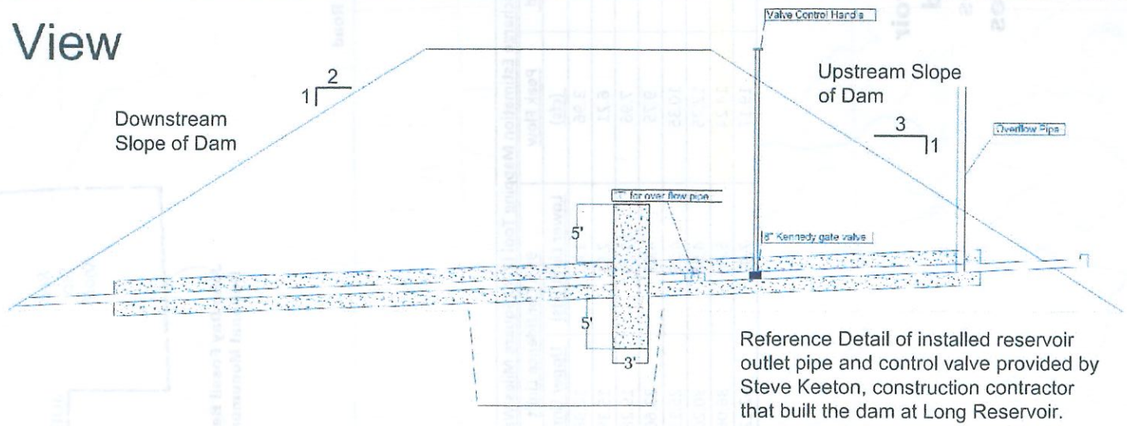
Primary Outlet

Primary Outlet Pipe & Concrete Encasement Detail

Top View



Side View



Reference Detail of installed reservoir outlet pipe and control valve provided by Steve Keeton, construction contractor that built the dam at Long Reservoir.

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MARCH 15, 2017
JAMES B. NEWTON
Renews:

Proposed Dam Emergency Spillway Modifications

Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

SHEET 4 OF 7
PROJECT NO. CG 1000-104
DATE: JUNE 2020
DRAWN BY: R2D
DESIGNED BY: J. Newton

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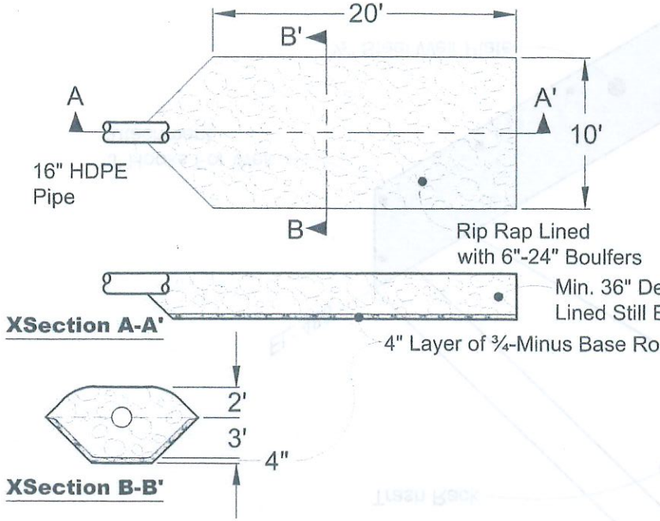

Stilling Basin Detail

Scale : 1" = 10'

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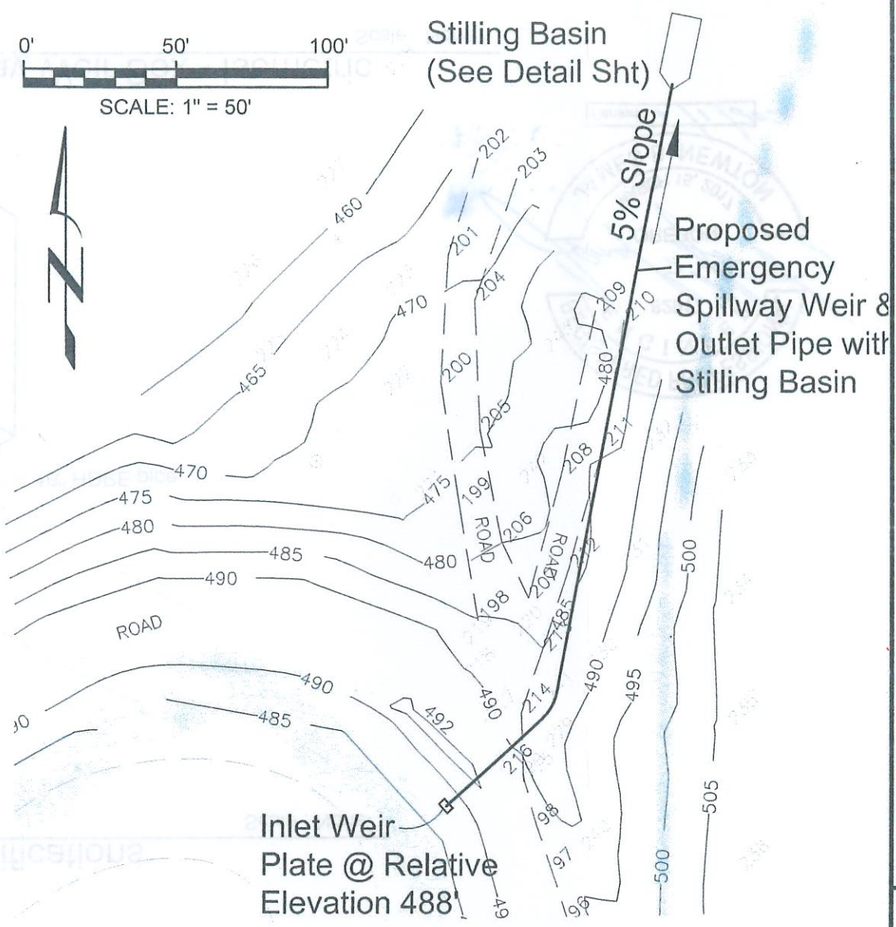
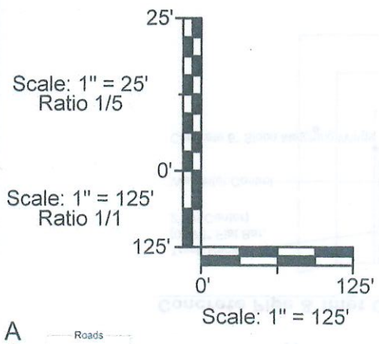
82917
OREGON
MARCH 15, 2017
JAMES B. NEWTON
Renews: 12/31/21



Proposed Emergency Spillway Weir & Outlet Pipe



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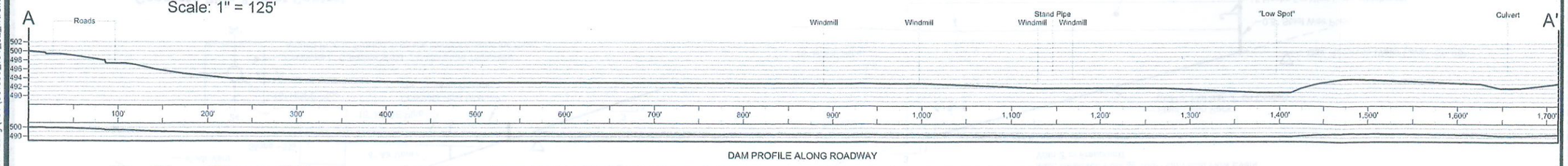

Profile - Top of Dam

Details

Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

SHEET 5 OF 7
PROJECT NO. CG 1000-104
DATE: JUNE 2020
DRAWN BY: R2D
DESIGNED BY: J. Newton

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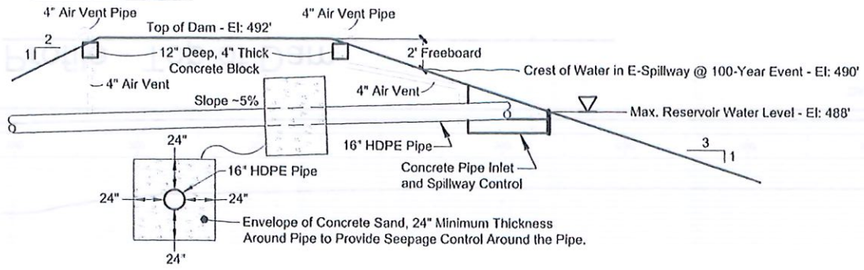
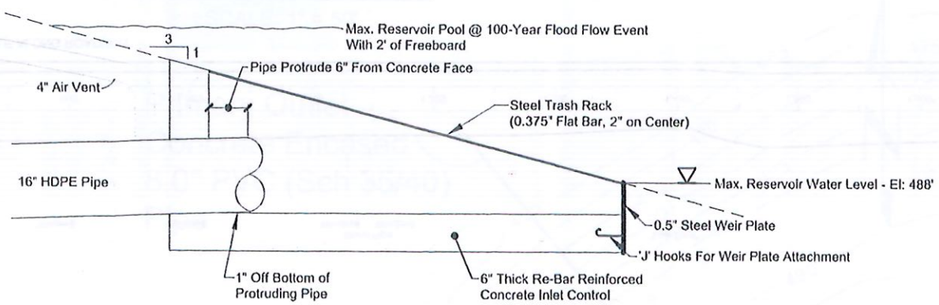
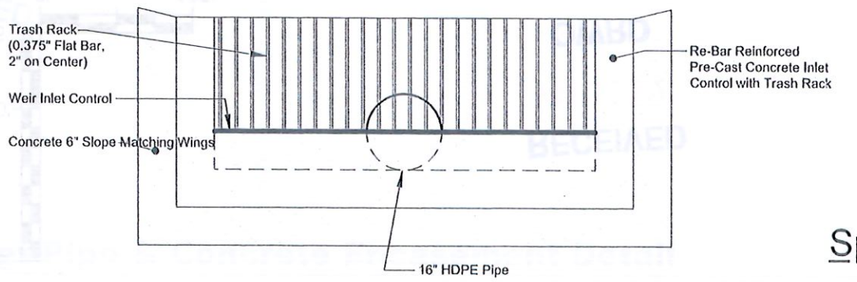
Dam X-Section



X-Section - Concrete Pipe & Inlet Control



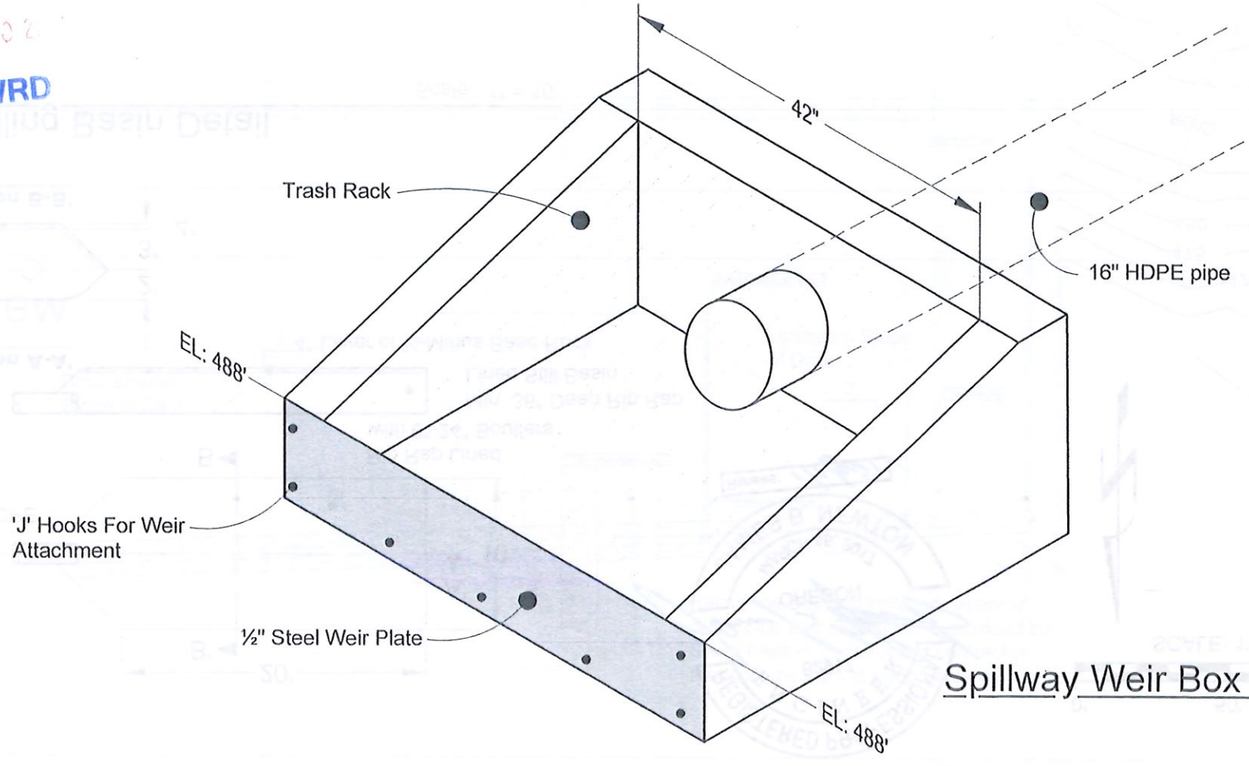
Concrete Pipe & Inlet Control



Long Reservoir Spillway Modifications Sketch 2

Spillway Modifications

Scale : None



Spillway Weir Box - Isometric

Scale : None

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82917
OREGON
MARCH 15, 2017
JAMES B. NEWTON
Renews: 6/11/22

Details

Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

SHEET 6 OF 7

PROJECT NO. CG 1000-104

DATE: JUNE 2020

DRAWN BY: R2D

DESIGNED BY: J. Newton

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Specifications:

New Emergency Spillway Weir Box and Pipeline

The new emergency spillway weir box shall be constructed to the following specifications:

- The weir box should be constructed to allow close tolerance pass through of the 16-inch nominal HDPE pipeline, the pipeline shall be identified prior to fabrication of the weir box to allow for proper sizing of the weir box pipeline penetration.
- The weir box shall be formed with wall thickness no less than 6-inches from outside edge to outside;
- Co shall be 6-sack concrete meeting 3,500 pounds per square inch at 28 days; slump shall not exceed 4-inches.
- No. 2 Rebar shall be plncreteaced approximately center of the 6-inch weir box panels, located along the perimeter of all weir box panels, allowing for a minimum of 3-inches from panel ends.
- The weir box shall be equipped with a weir plate that is level with the bottom of the weir box, and placed level to the ground so that water flows over the weir plate level. The weir plate shall be constructed of 0.375-inch thick steel and powder coated to reduce corrosion.
- J-bolts shall be inserted in the weir box to allow attachment points to be exposed to mount the weir plate. J-bolts shall be placed in the center of the weir box panels with two on each vertical end panel, and approximately 1-foot centers across the bottom of the weir box panel.
- The weir box shall be equipped with a trash rack made from 0.375" thick by 2" steel flat bar constructed with 2-inch on center. The perimeter of the trash rack shall be attached to the weir box with either cast in place J-bolts, or, drilled and epoxied anchor bolts to allow for removal, repair and/or replacement.

The new weir box pipeline shall be constructed to the following specifications:

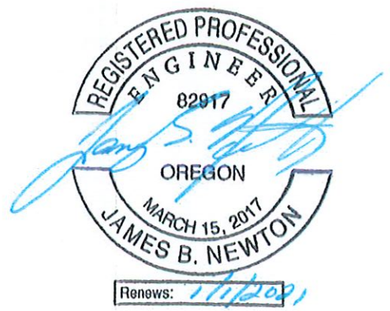
- The pipeline shall be composed of HDPE DR32.5 16-inch IPS pipe having a minimum I.D. of 14.0 inches. If an alternate pipe is proposed, confirmation of the conformation of the alternative must be approved by the engineer of record prior to installation of the pipeline.
- The pipe shall be butt-fusion welded by a certified butt-fusion operator using a welding machine certified to weld the proposed pipeline.
- Pipe shall protrude from the interior face of the weir box by a minimum of 6-inches;
- If a pipe collar is not cast in place during fabrication of the weir box, the annuls space between the HDPE pipe and the concrete weir box shall be sealed with a no shrink grout.
- The pipeline shall be placed in a clean trench properly compacted to the compaction specification enclosed herein, and be set to a uniform slope of 5%. In areas outside of the dam where the pipeline must follow the native slope of the adjacent hillside, the pipe will continue to be installed with a uniform 5% slope.
- The pipeline will be buried and compacted with suitable backfill material approved by the engineer of record, to be compacted in place and have no rock or other hard materials larger than 3-inches of nominal size to reduce point loads on the pipeline. Backfill material shall cover the pipe a minimum of 2-feet below ground surface.
- The backfill material within the dam abutment will have an envelope of concrete sand placed near the centerline of the dam suitable to allow for 2-feet of concrete sand placement around the pipe and a minimum of 5-feet in pipe length to provide a filter cutoff reducing the potential or fine-grained embankment fill material from piping and eroding the spillway outlet pipe.

Compaction of weir box and spillway pipeline:

- Penetrations through the dam abutment shall be excavated to a uniform bottom and recompacted to meet the 92% compaction with +/-2% of maximum moisture content.
- Compacted materials will be placed at lifts not exceeding 8-inches in uncompacted height to a relative uniform thickness and meet compaction testing specifications.
- Compaction tests by a certified material testing laboratory and field personnel must be done of borrow/fill materials prior to placement of fill material and every 2.5 feet of total lift placement. Reports of compaction and location of compaction tests shall be provided to the engineer of record for reporting to the OWRD Dam Safety.

Stilling Basin

- The outlet of the emergency spillway shall discharge into a stilling basin measuring a minimum top width of 10 feet, length of 20 feet and a minimum water depth of 2-feet.
- Riprap lining in the stilling basin shall be underlain by 4-inches of ¾-minus crushed rock.
- Riprap comprising the stilling basin shall be composed of 6-inch to 24-inch durable and angular basalt approved by the engineer. The riprap shall be placed so the 24-inch boulders are close-packed by the smaller cobbles and boulder materials as to create an interlocking matrix of riprap to reduce scour and erosion of the stilling basin.



Dam Specifications
Long Reservoir Dam - 'Canyon Properties, LLC
Wheeler County, Oregon

SHEET 7 OF 7
PROJECT NO. CG 1000-104
DATE: JUNE 2020

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DESIGNED BY: J. Newton