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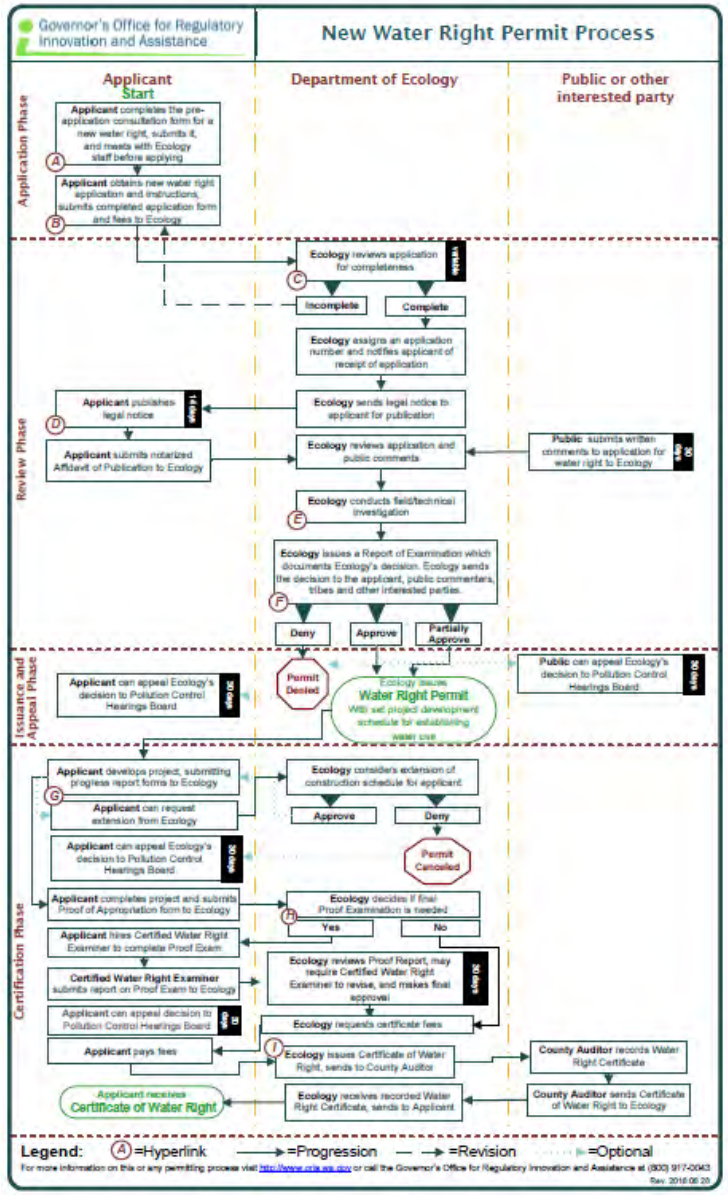
CASE STUDY: Benchmark Farms

A New Water Right for 1,600 Acres

2024 WATER LAW IN EASTERN WASHINGTON CONFERENCE

BEN LEE, PE, CWRE

// New Water Right Application Process



Source: WA Governor's ORIA

1) APPLICATION

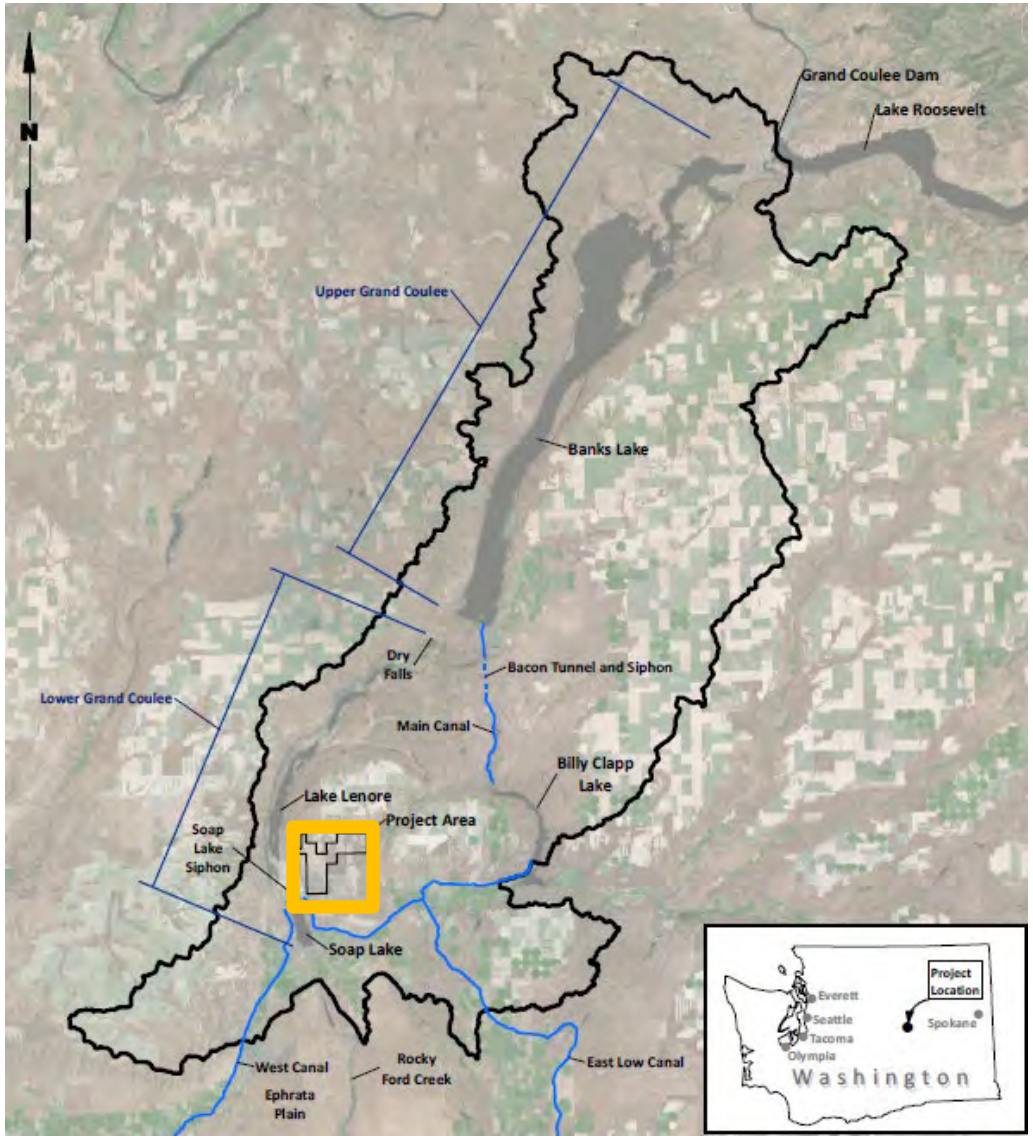
2) REVIEW

3) PERMIT ISSUANCE/APPEAL

4) CERTIFICATE

But first, some background…

// Benchmark Farms - Background



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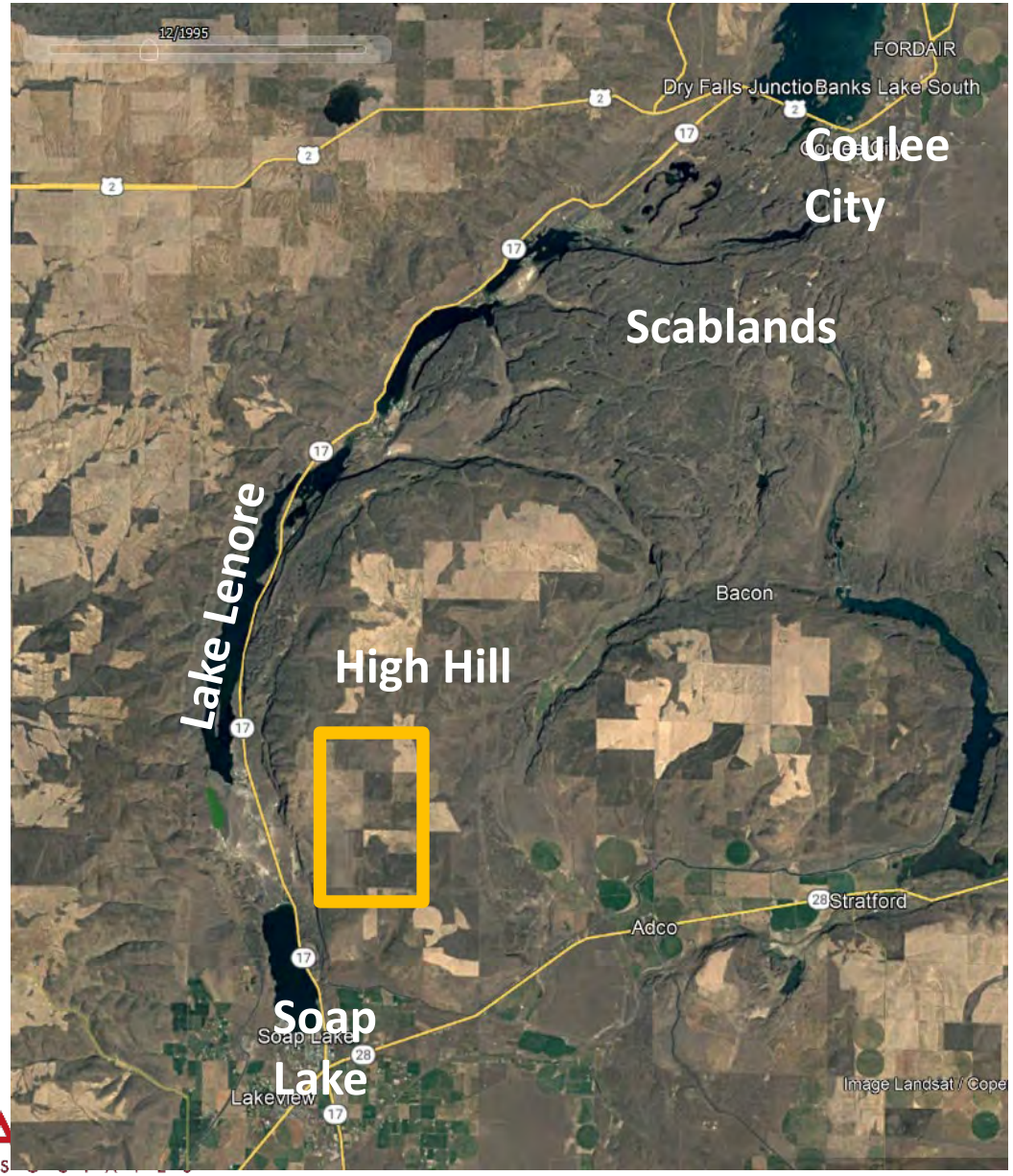
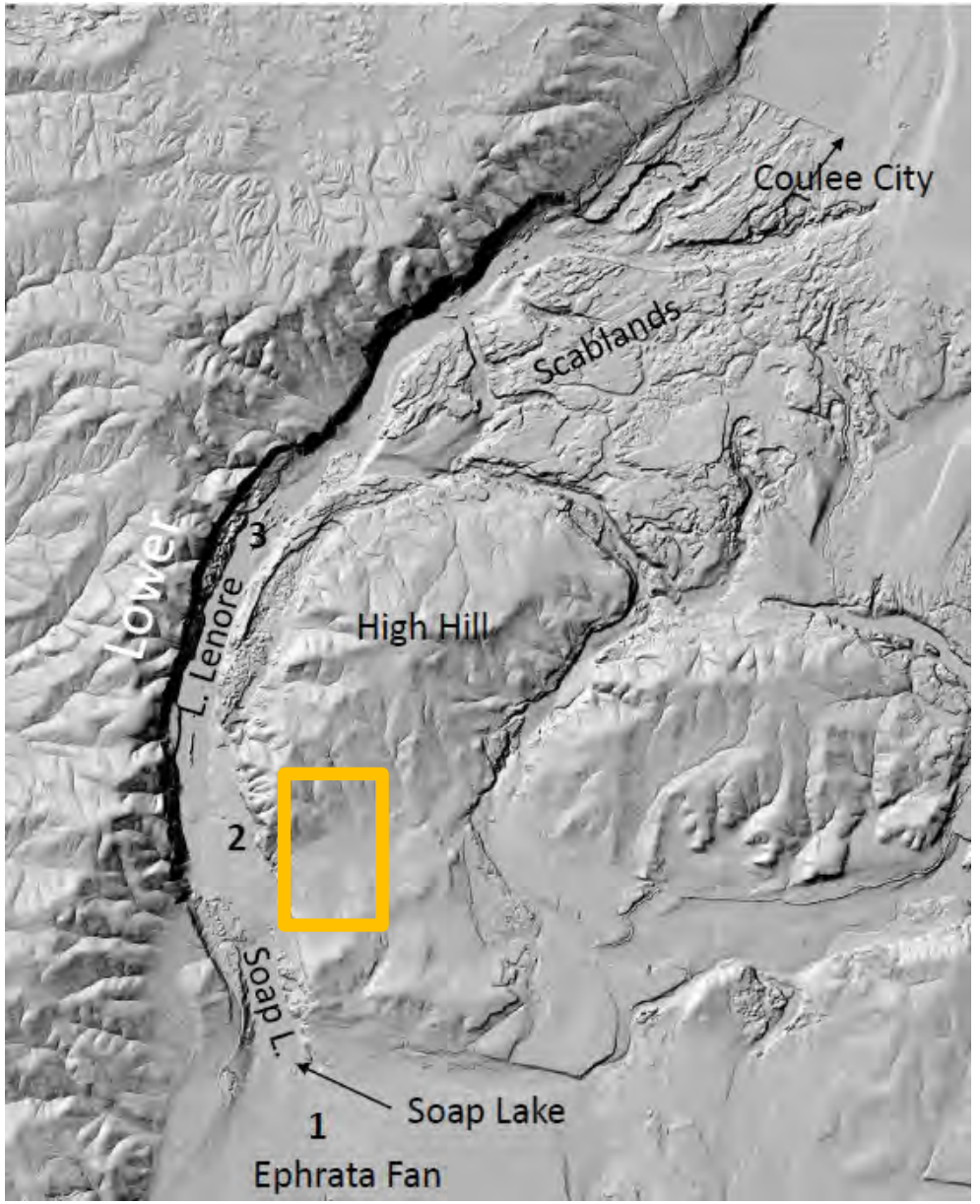
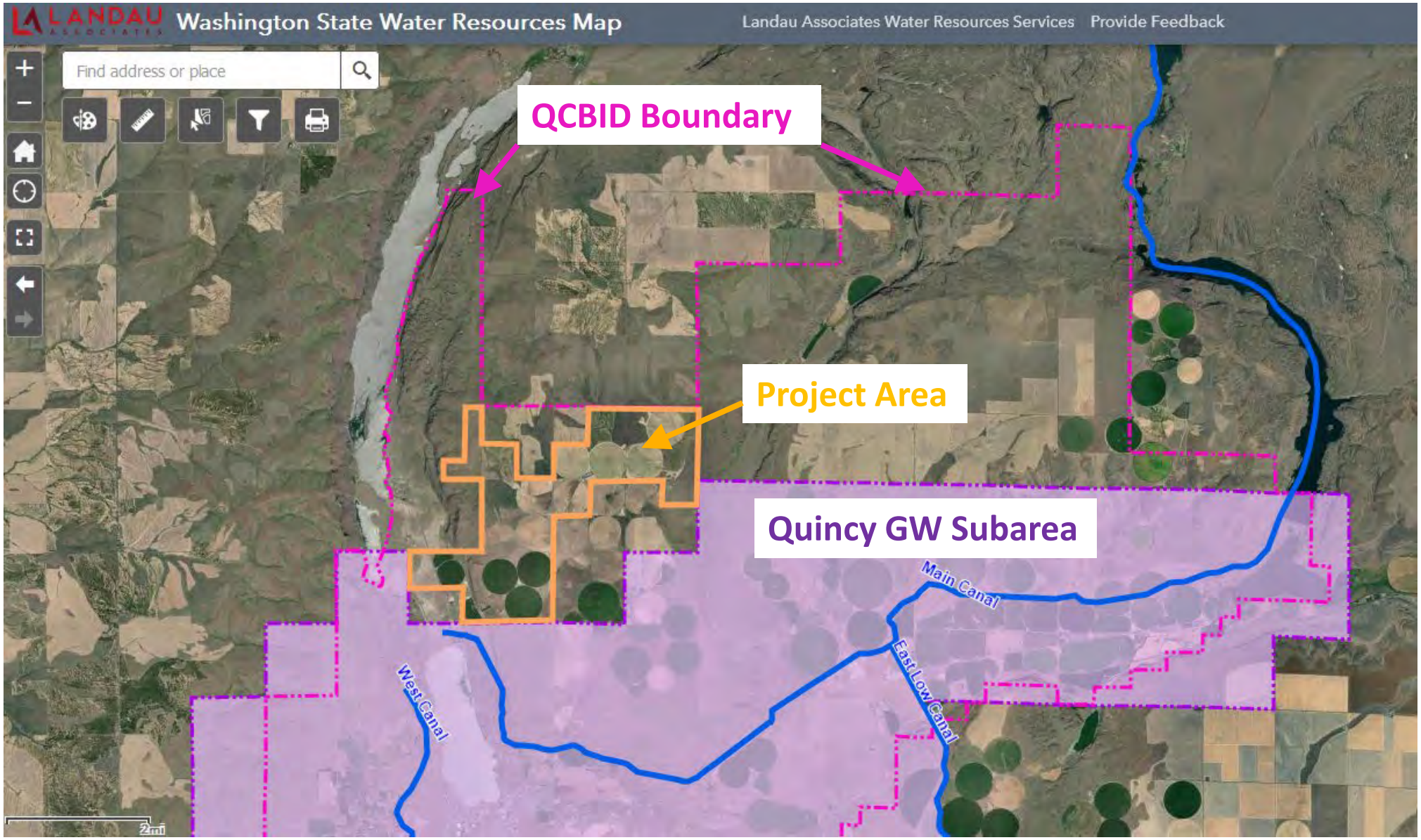
// Benchmark Farms - Background





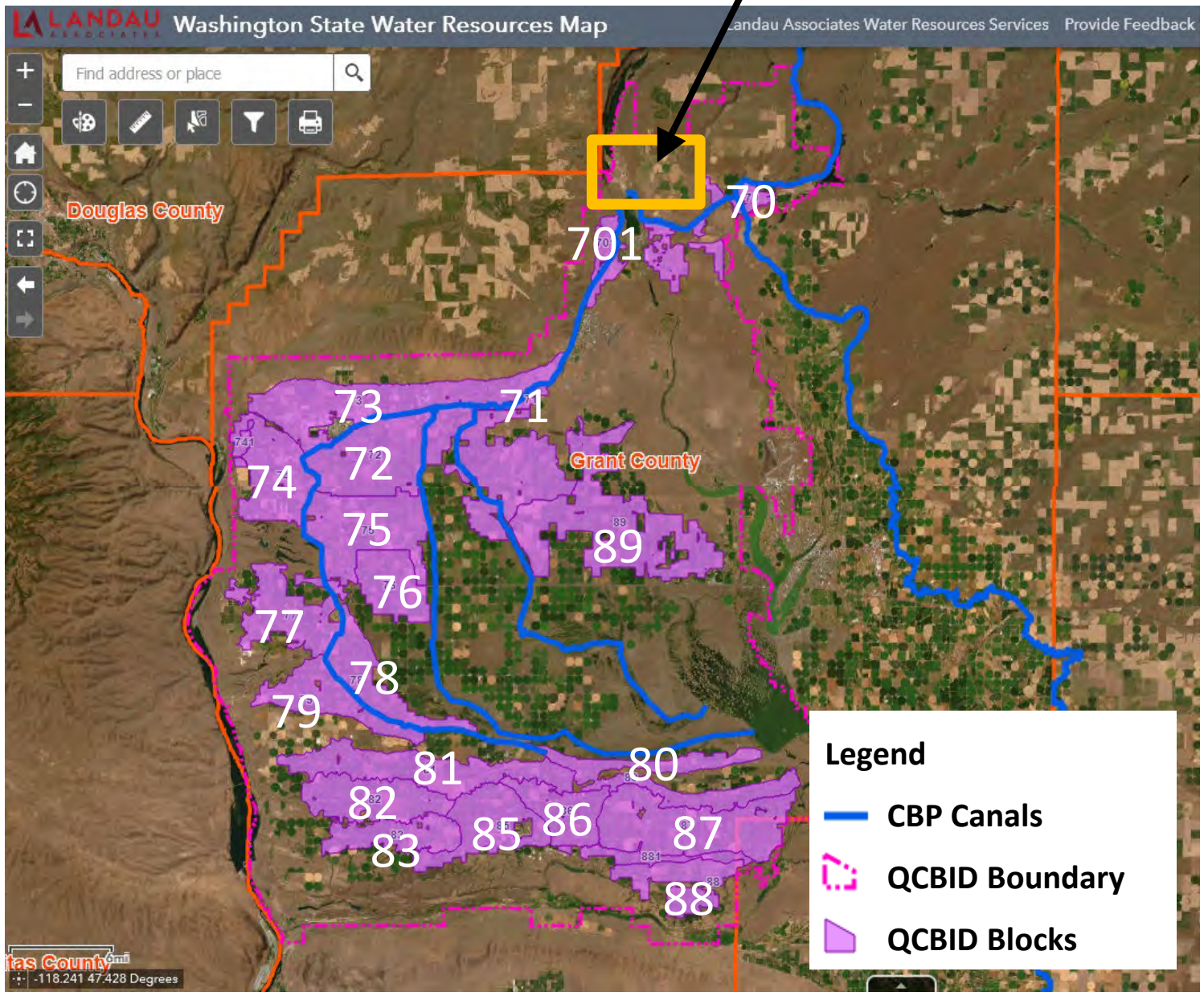
// Benchmark Farms - Background



// History

COLUMBIA BASIN PROJECT

- Quincy-Columbia Basin Irrigation District development by Block
  - Rill or flood irrigation at the time
- Soap Lake Basin (Block 91) Deferred
  - 1967 USBR Directive



COLUMBIA BASIN PROJECT – CANAL AND SIPHON INFRASTRUCTURE

Source: University of Washington

// History

THE "SOAP LAKE PROBLEM"

INVESTIGATION OF THE RISE IN LEVEL
OF SOAP LAKE
AT SOAP LAKE, WASHINGTON

By

M. J. Mundorff, Ground Water Branch
and
G. L. Bodhaine, Surface Water Branch

1954

SOAP LAKE PROBLEM, COLUMBIA BASIN PROJECT (S. 3730) AND ACREAGE LIMITATIONS, COLUMBIA BASIN PROJECT (S. 3826)

1176-5

HEARING
BEFORE THE
SUBCOMMITTEE ON
IRRIGATION AND RECLAMATION
OF THE
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
UNITED STATES SENATE
EIGHTY-FOURTH CONGRESS

THE SOAP LAKE PROBLEM
SOAP LAKE, WASHINGTON

Prepared By
Bureau of Reclamation
Columbia Basin Project

Ephrata, Washington

MARCH 1956

VOL. 7, NO. 4 WATER RESOURCES RESEARCH AUGUST 1971

A Model of the Hydrology of the Lakes of the Lower Grand Coulee, Washington

IRVING FRIEDMAN

U.S. Geological Survey, Denver, Colorado 80225

ALFRED C. REDFIELD

// History

THE SOAP LAKE PROBLEM

HYDROLOGICAL CONTROLS AND FRESHENING IN MEROMICTIC SOAP LAKE, WASHINGTON, 1939-2002[1]

Jahn Kallis, Leo Bodensteiner, and Anthony Gabriel[2]

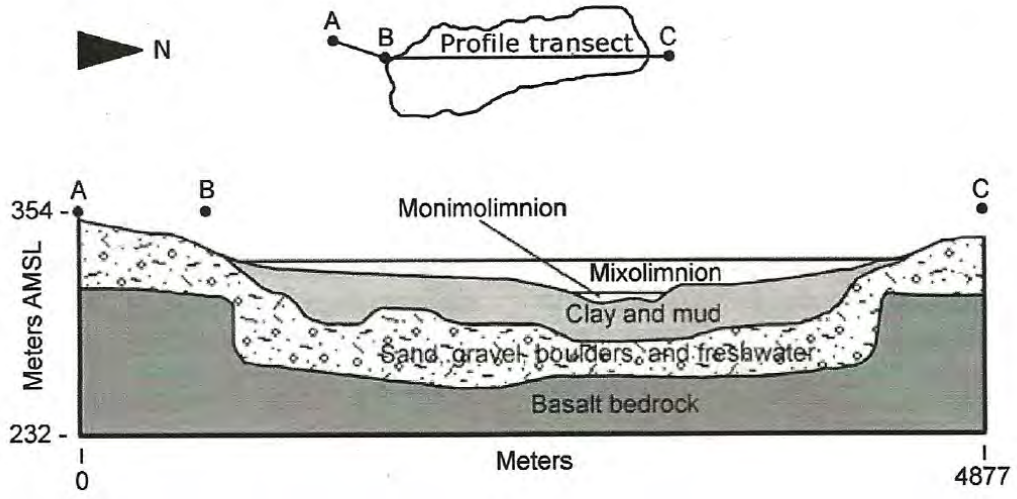
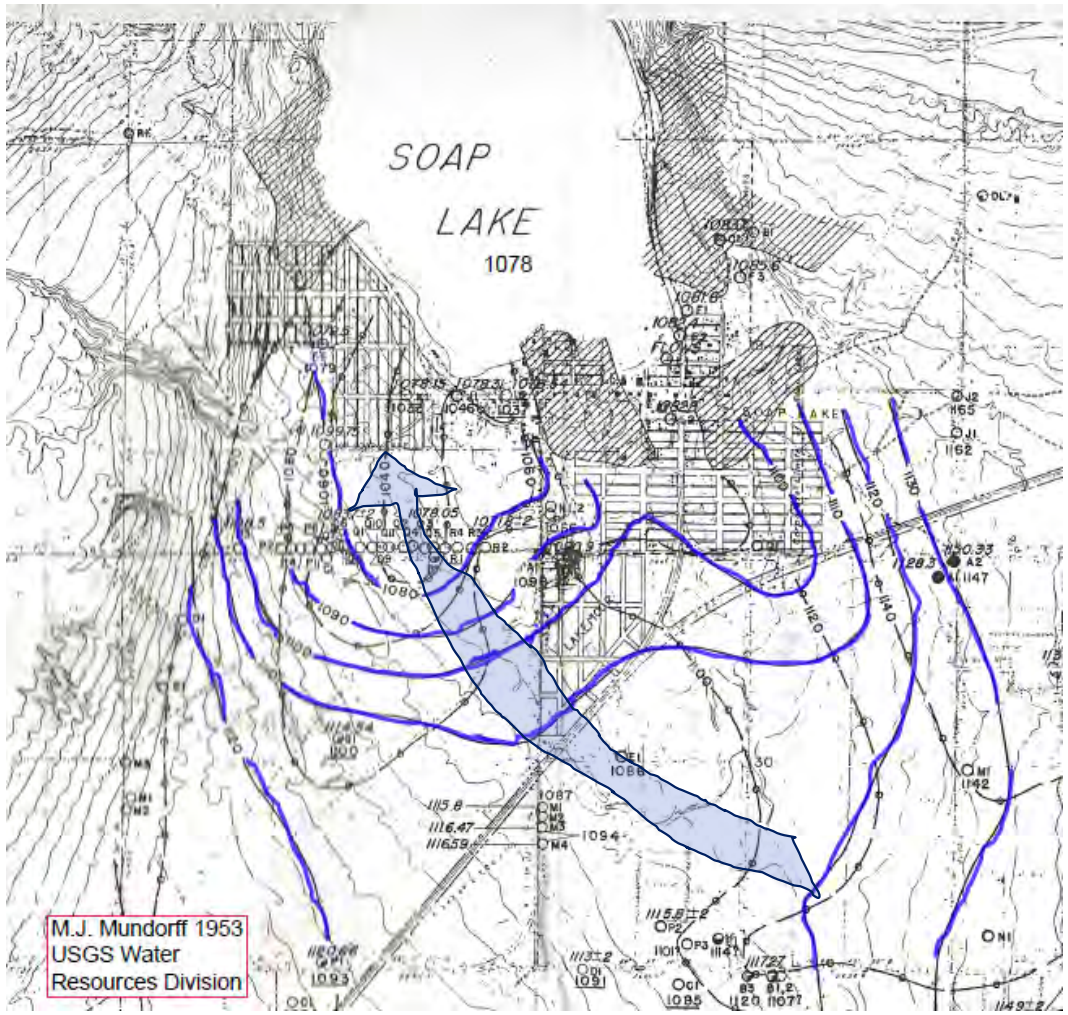
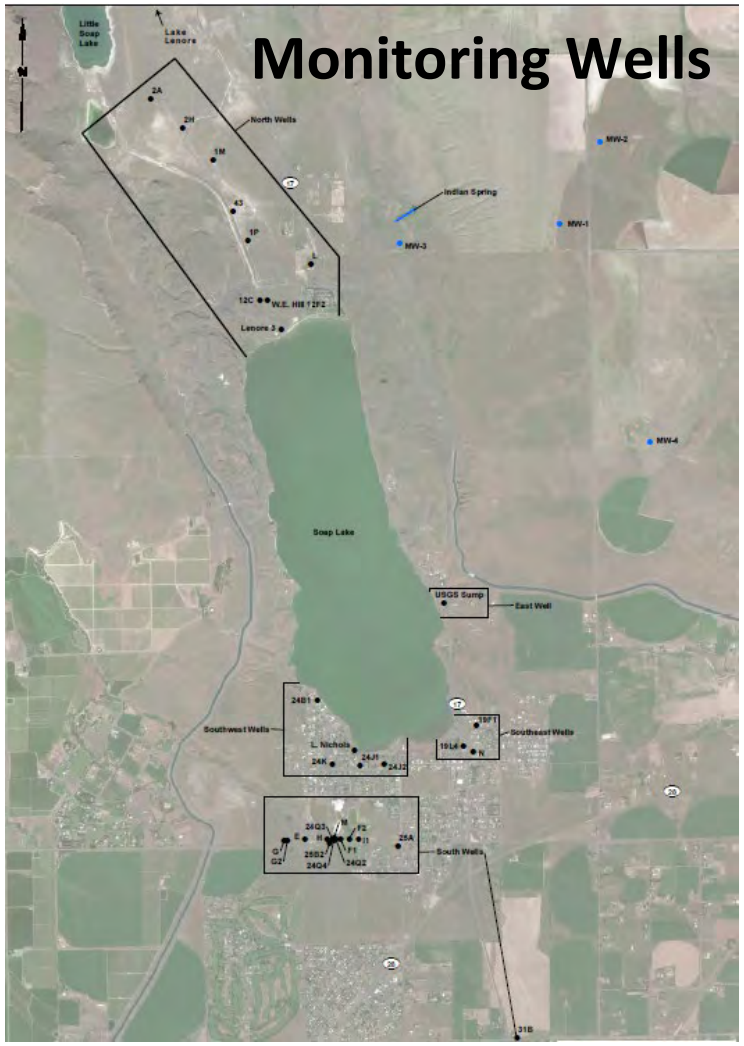


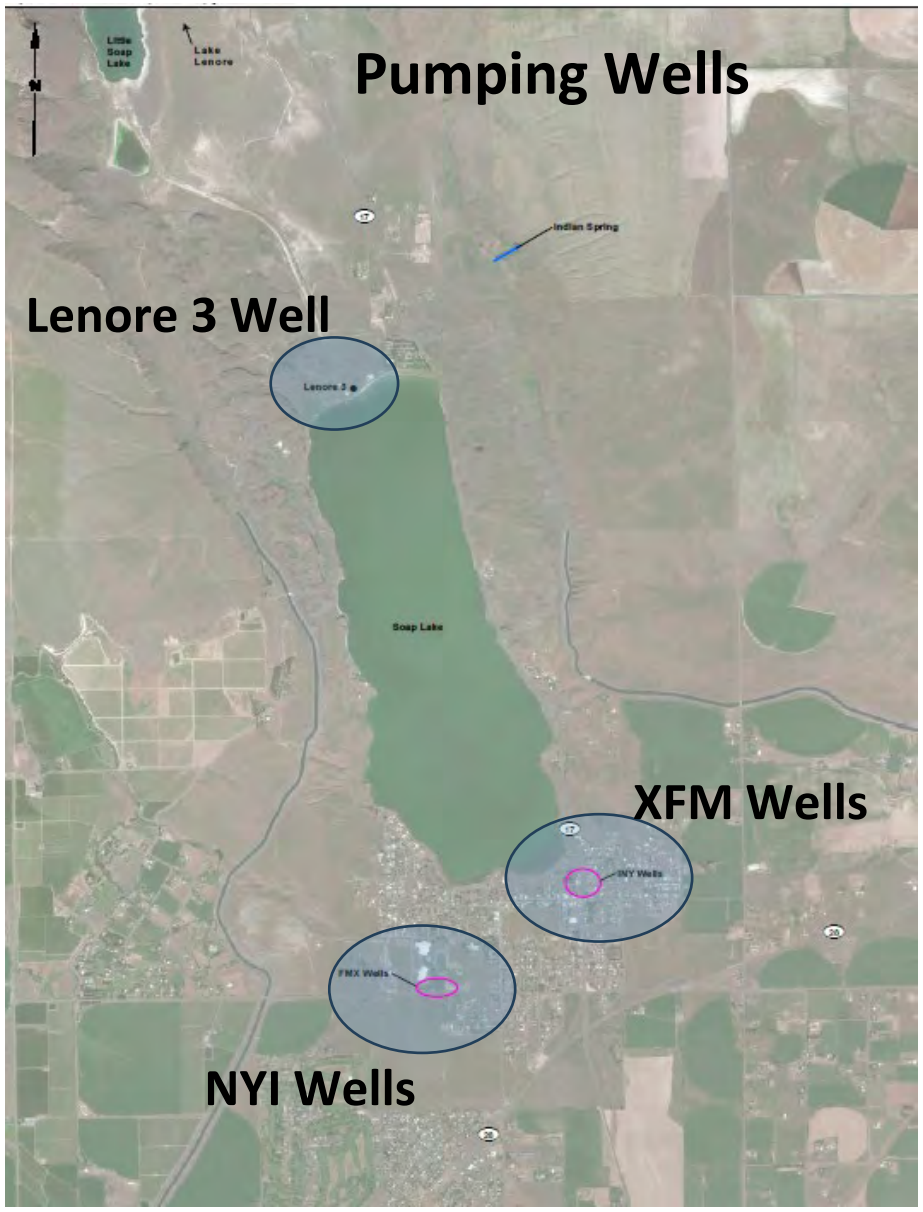
FIGURE 2. Cross-Sectional Profile of Soap Lake Showing Chemical Strata and Subsurface Geology (USBR, 1945).



// History

SOAP LAKE PROTECTIVE WORKS





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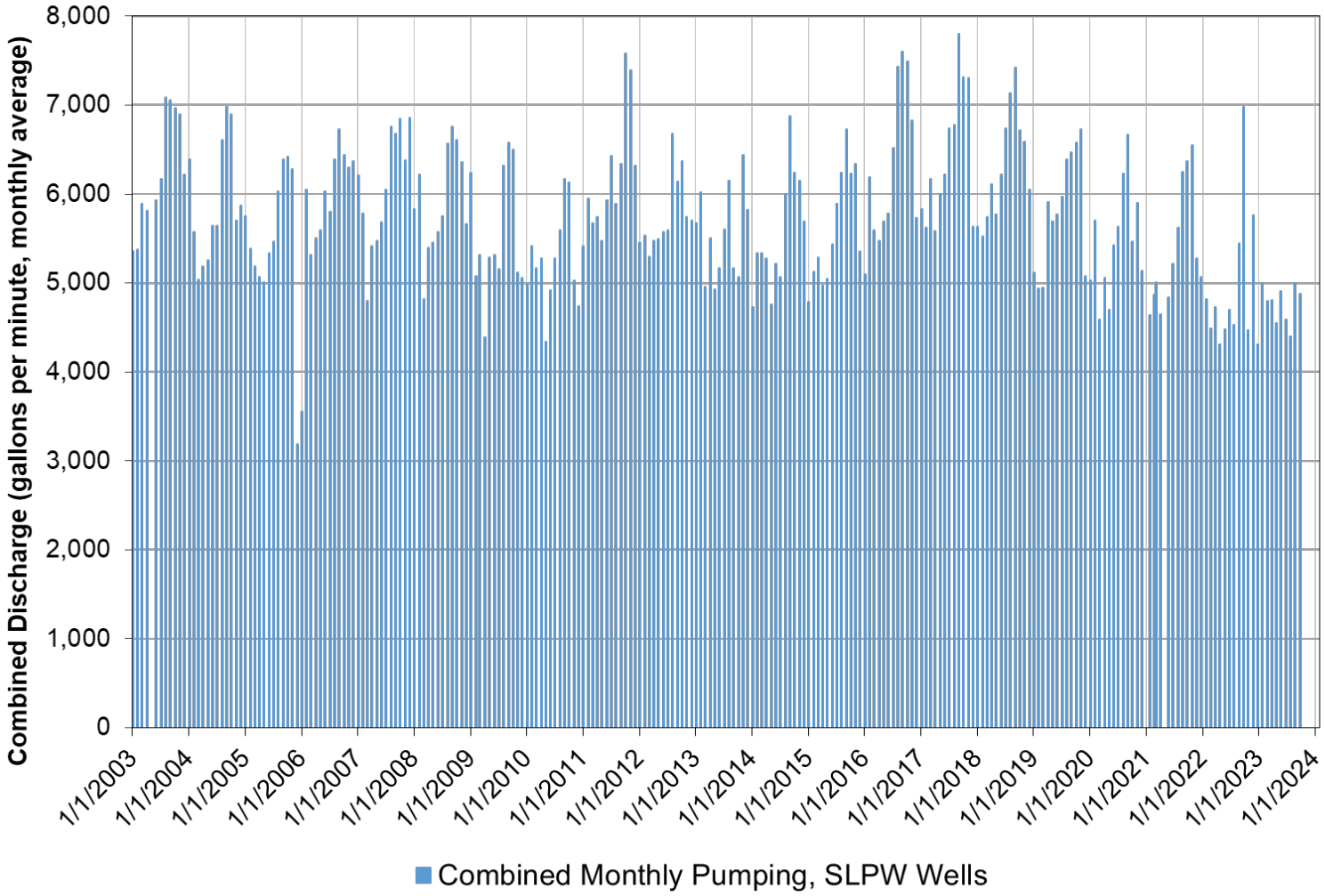
// History

SOAP LAKE PROTECTIVE WORKS



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// Benchmark Farms - Background

AN IDEA IS BORN…

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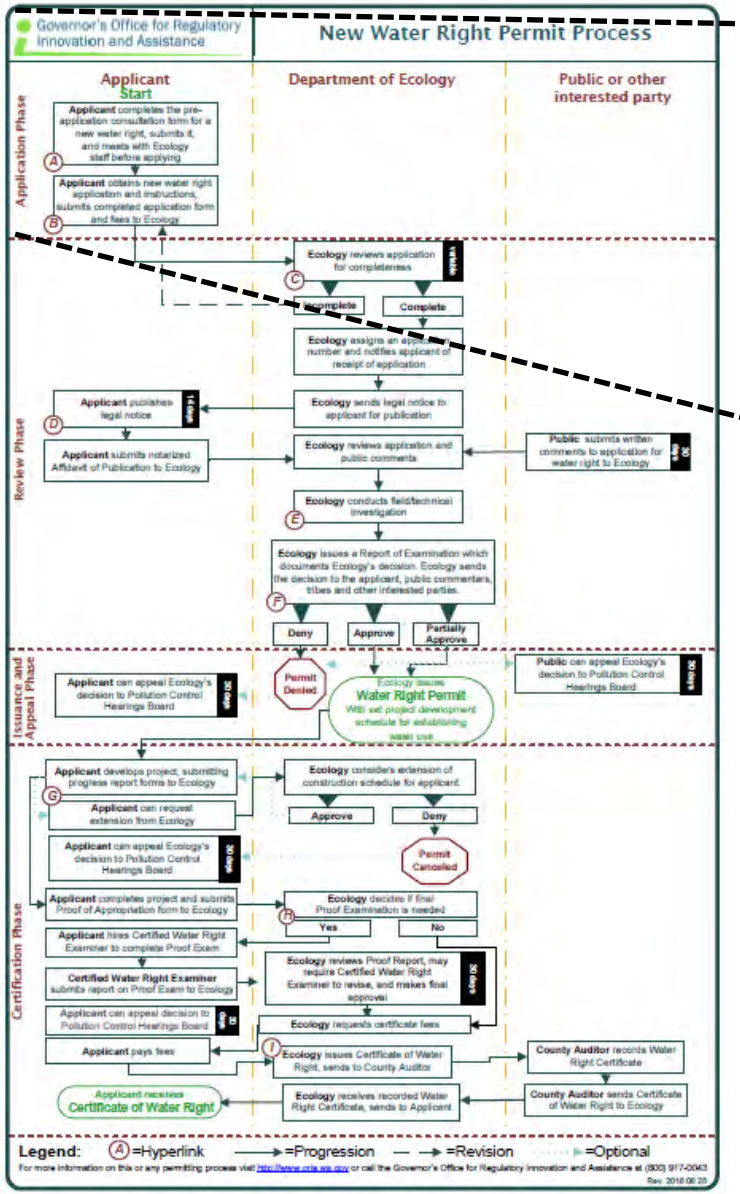
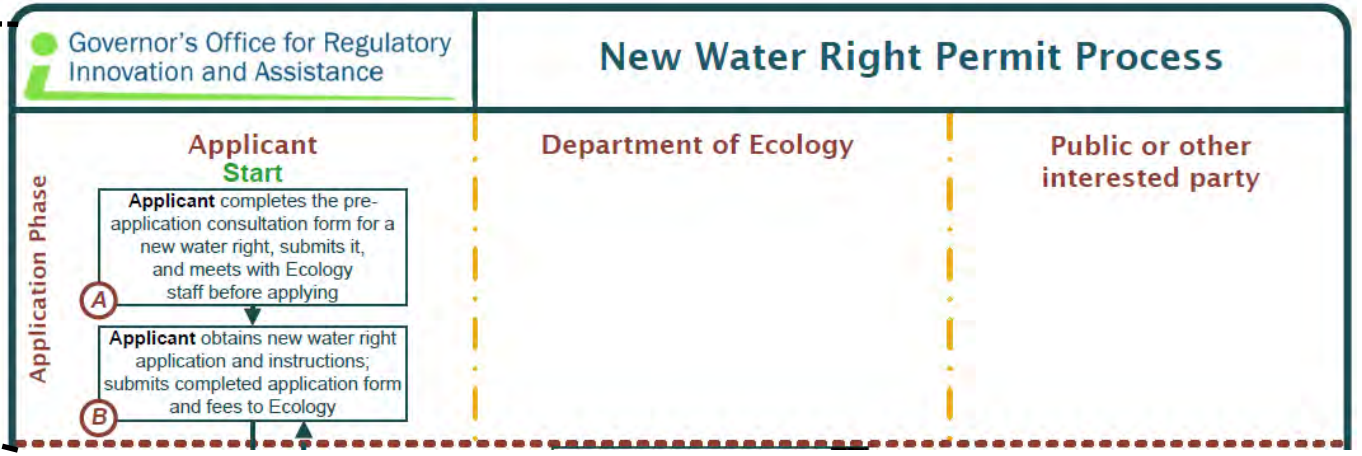
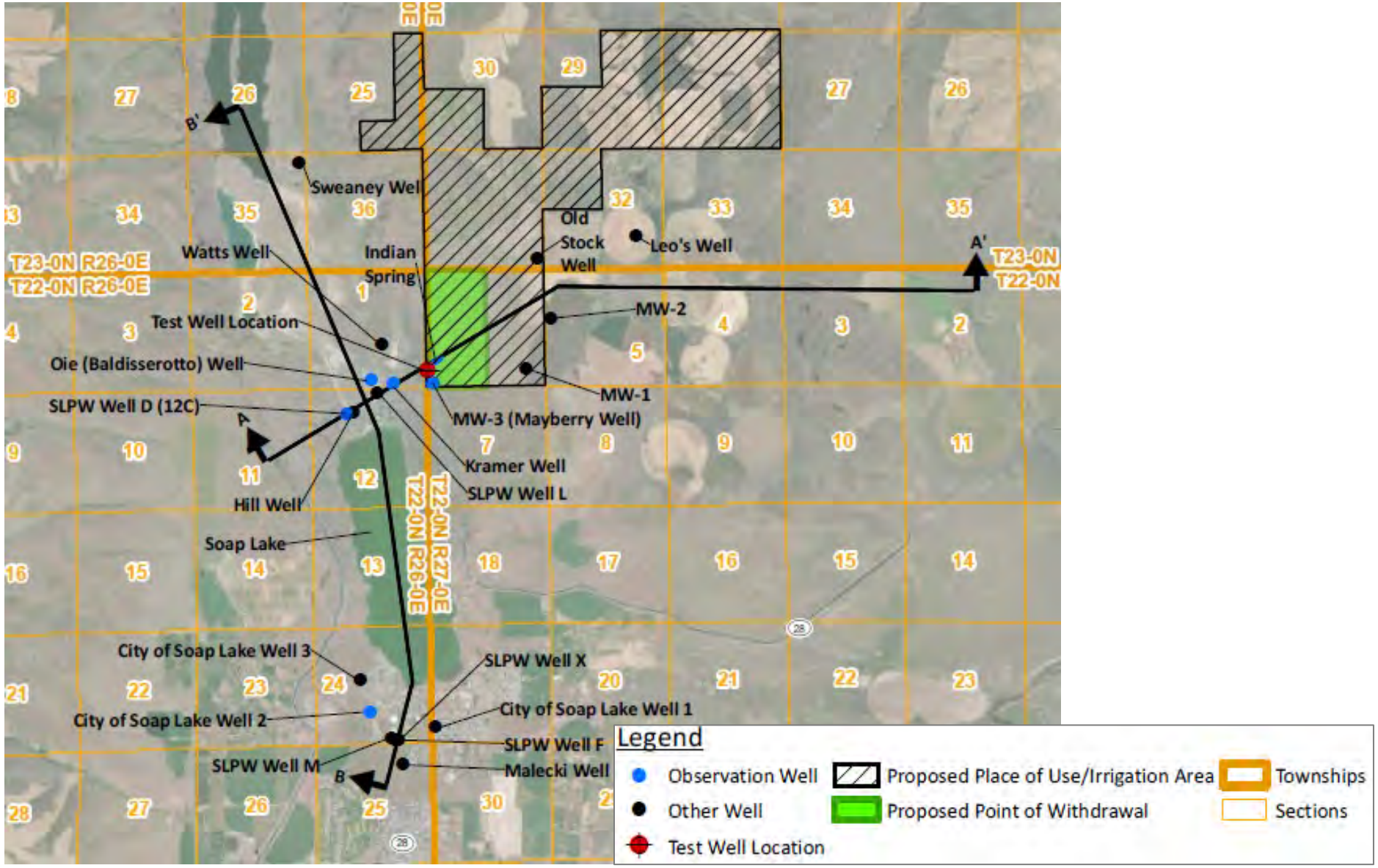
New Water Right Application Process – the Application



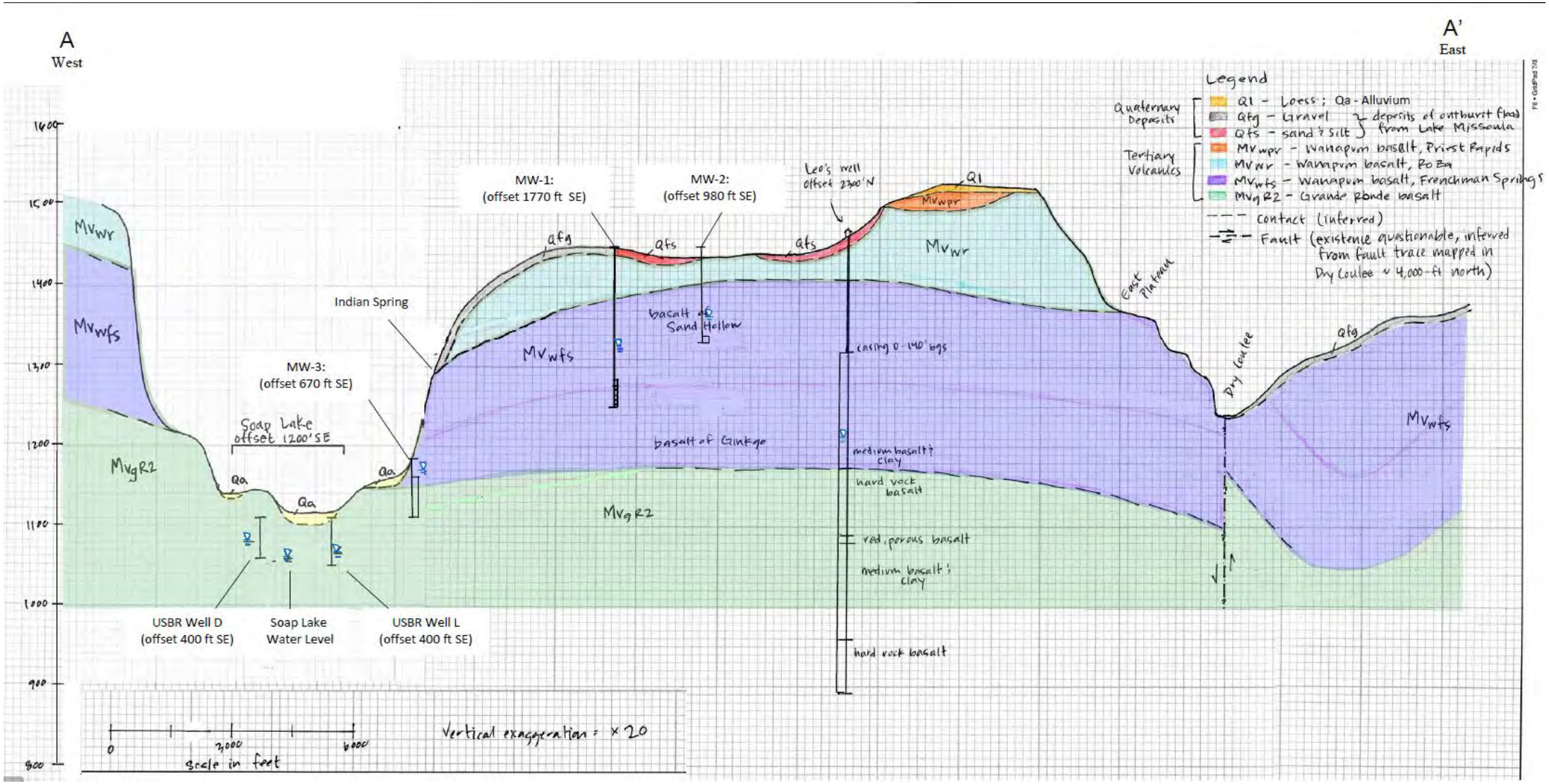


- Pre-Application Meeting(s)
- Application – G3-30774 (Sept. 21, 2016)
  - Quantities: 10,200 acre-ft; 20,500 gpm; 2,920 acres; 10 wells
  - Hydrogeologic Information
  - Preliminary System Design
  - Fees
  - Public Notice and Stakeholder Involvement

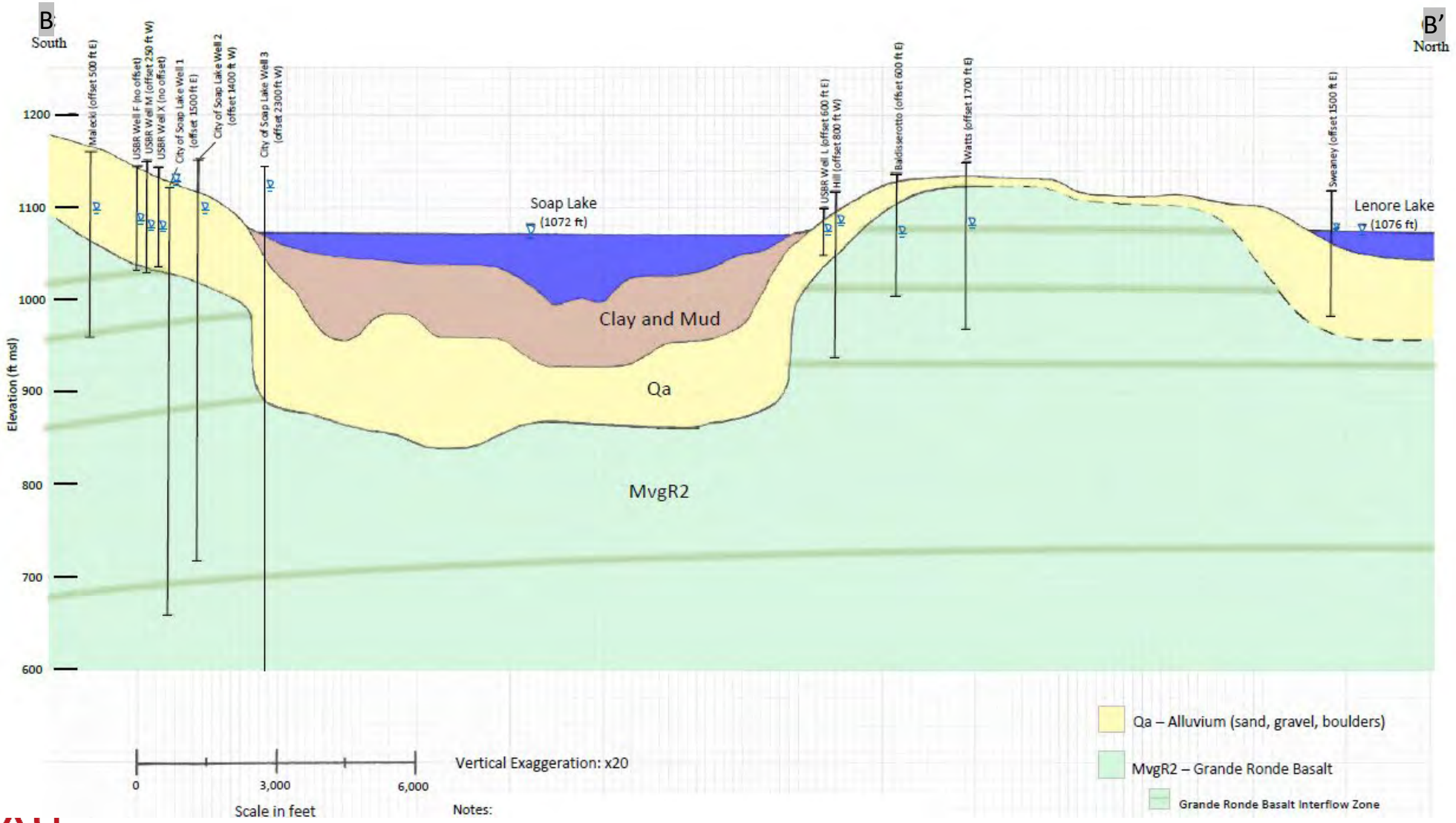
// Application – Hydrogeologic Supporting Information



// Application – Hydrogeologic Supporting Information



// Application – Hydrogeologic Supporting Information



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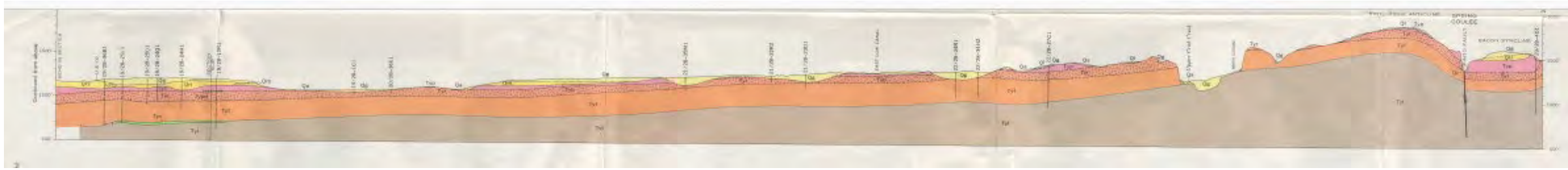
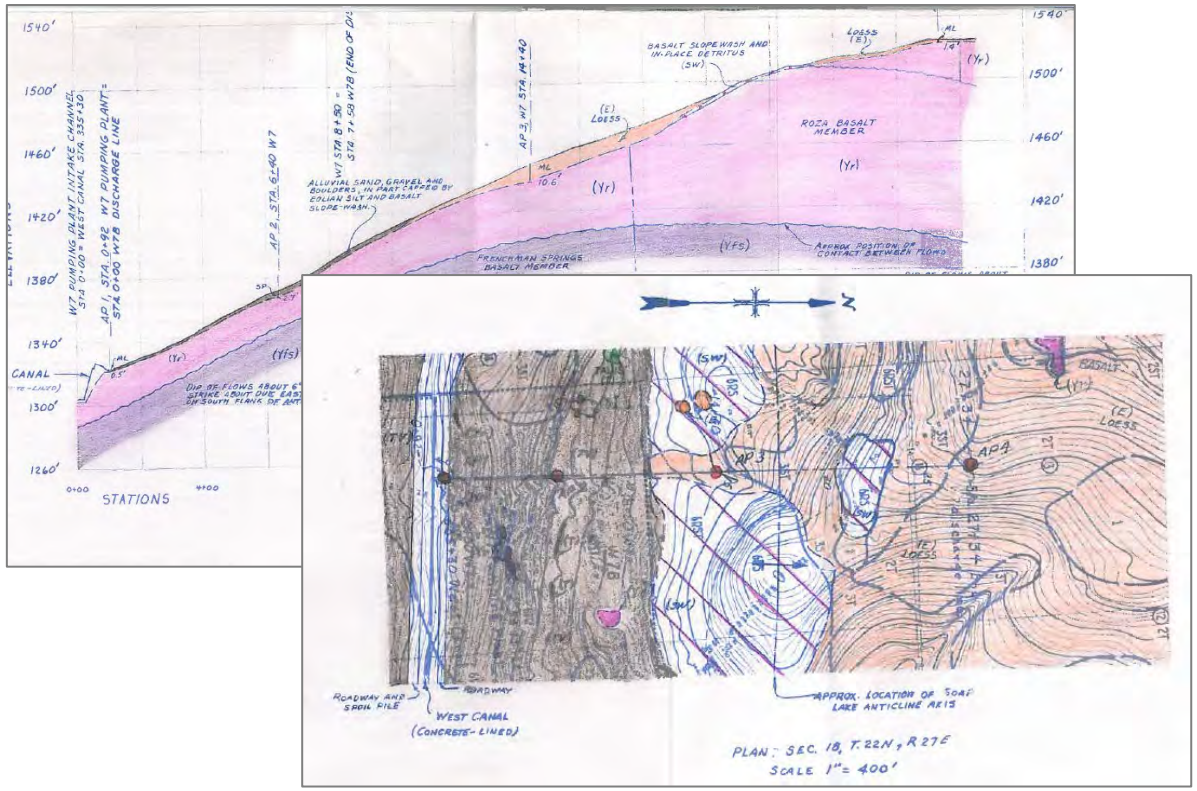
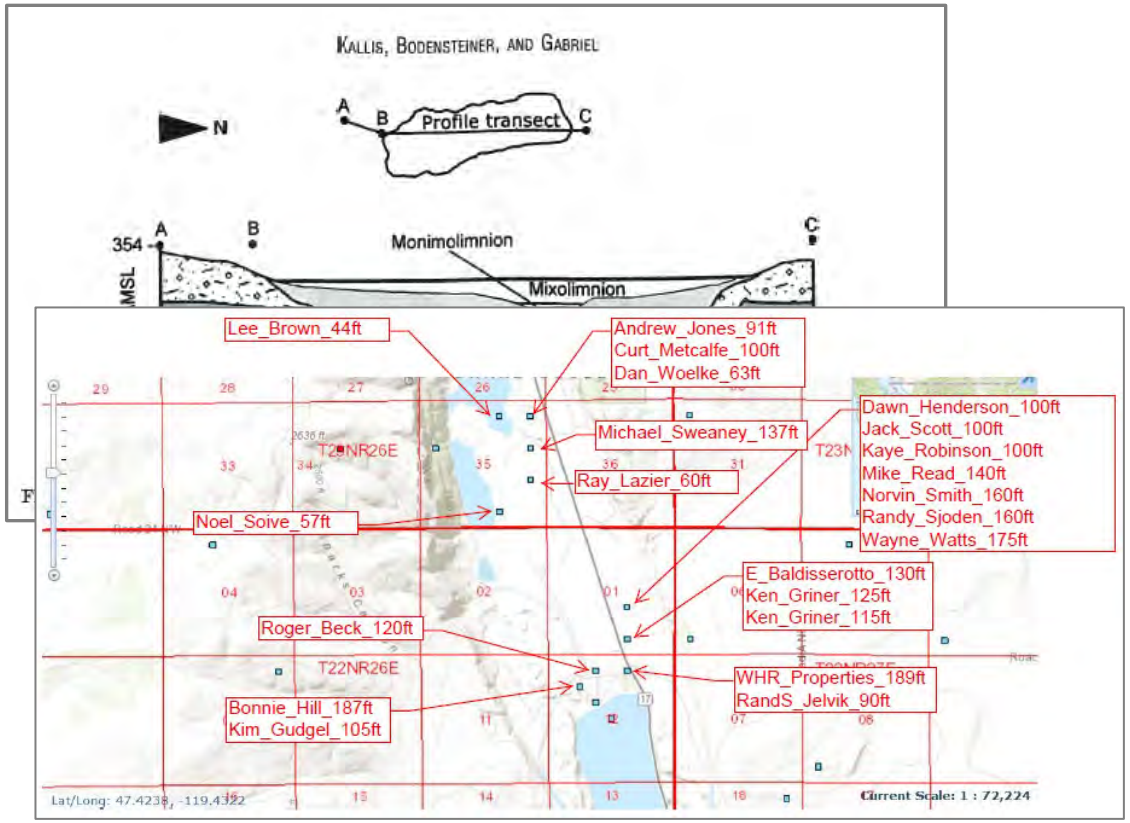
// Application – Hydrogeologic Supporting Information







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// Application – Hydrogeologic Supporting Information

"HELL TO BREAKFAST"

A STORY OF
THE COLUMBIA RIVER FROM MOLTEN LAVAS AND ICE
TO

The Grand Coulee Dam

By

FRED O. JONES

Chief Geologist for the National Hydroelectric Engineering Bureau
National Resources Commission of China

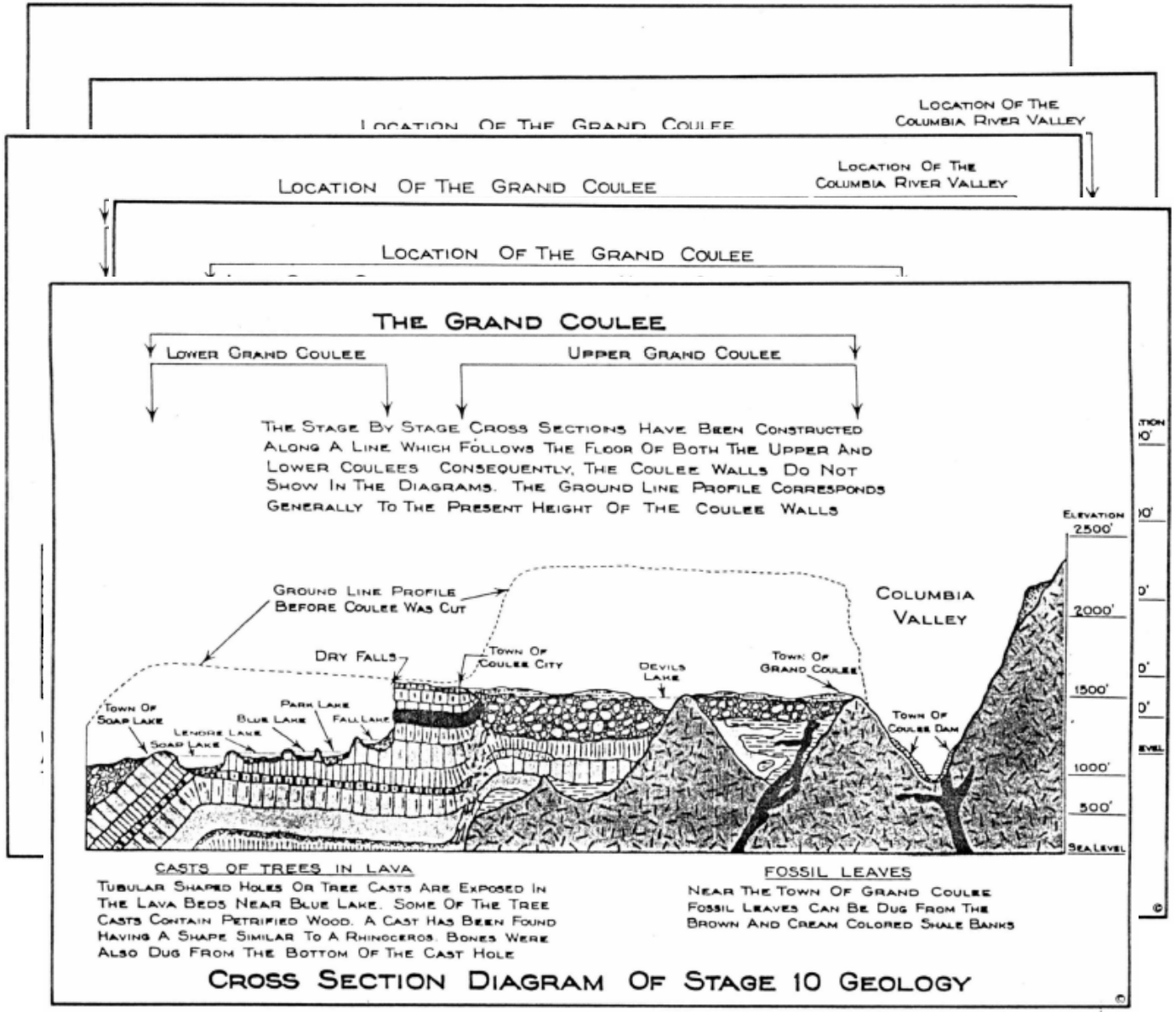
Formerly Geologist for the United States Bureau of Reclamation, Coulee Dam, Washington

Drawings by Charles W. Zack

Copyright, 1947,
by
Fred O. Jones

BINFORDS & MORT, Publishers, Portland, Oregon

All photos
by
U. S. Bureau of Reclamation
(unless otherwise noted)



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// Benchmark Farms - Application

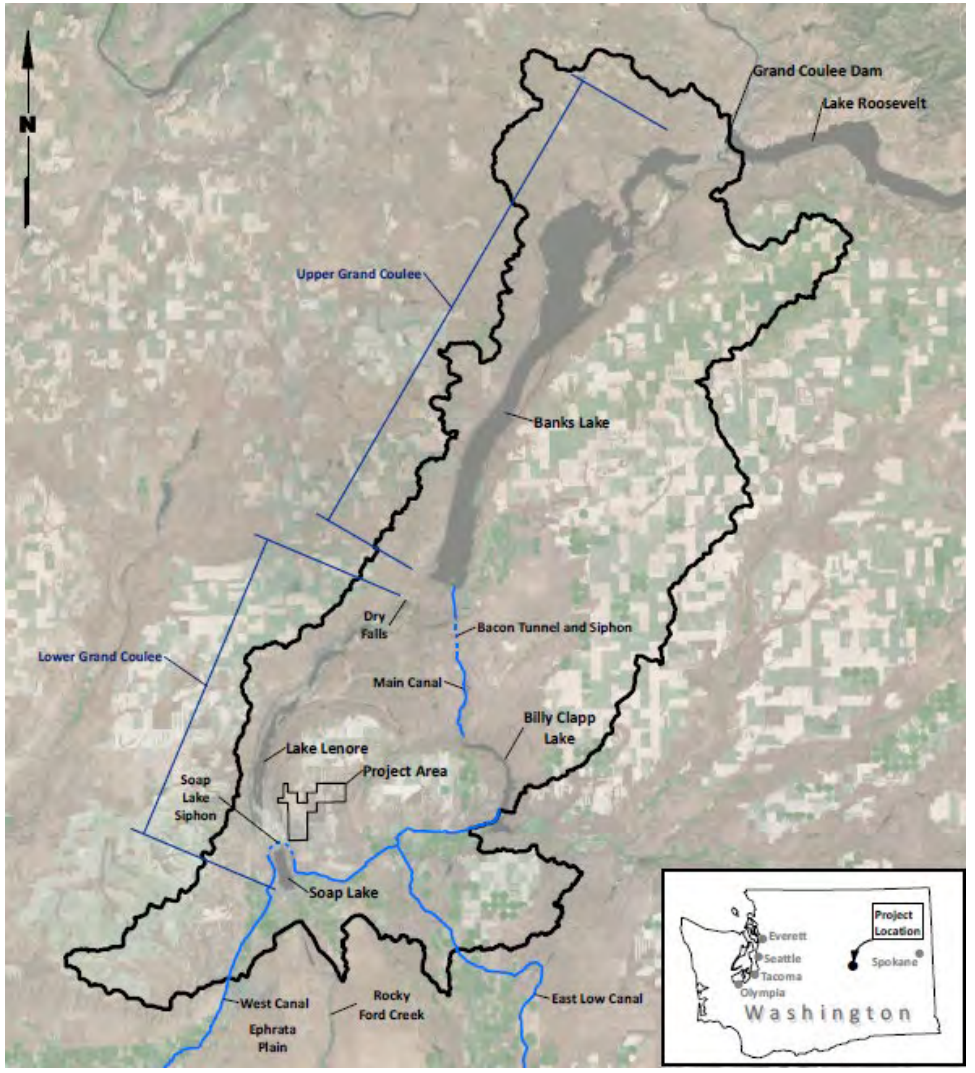
IMPAIRMENT AND WATER AVAILABILITY

Impairment

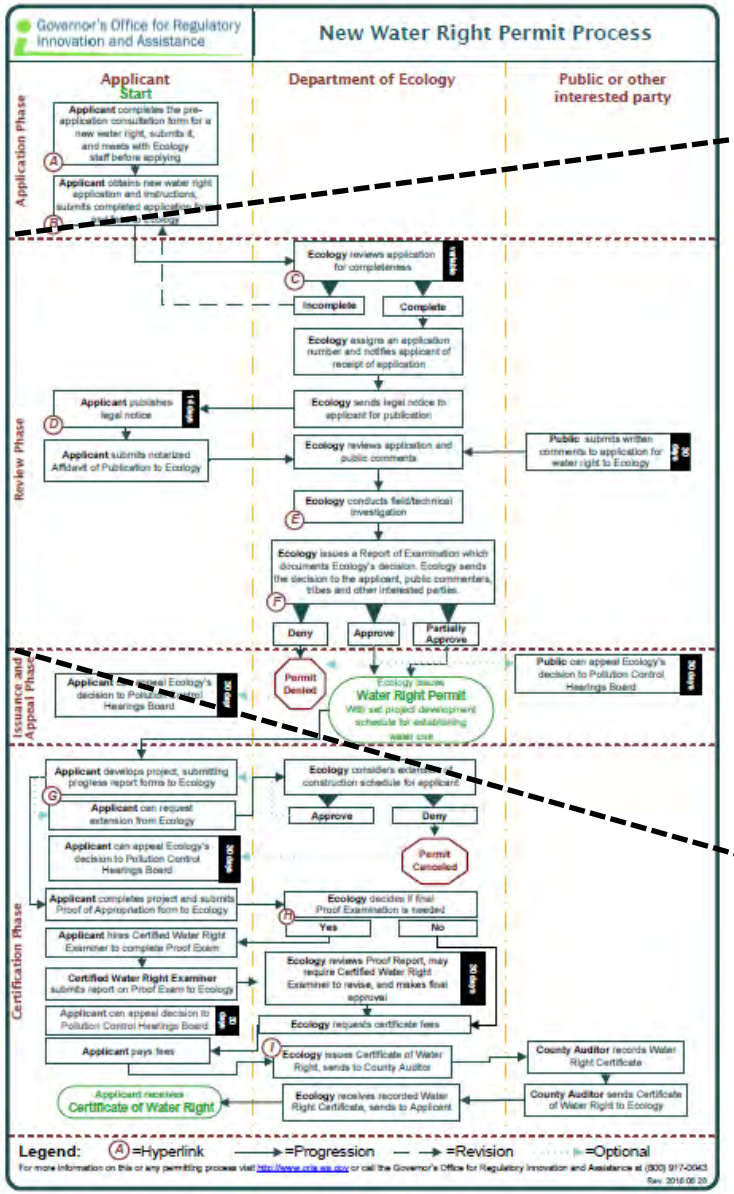
- Pumping would be a benefit to Soap Lake
- Any impact could be offset by reduced Bureau pumping
- Closed basin – no connection to regulated stream
- Local water supply wells?

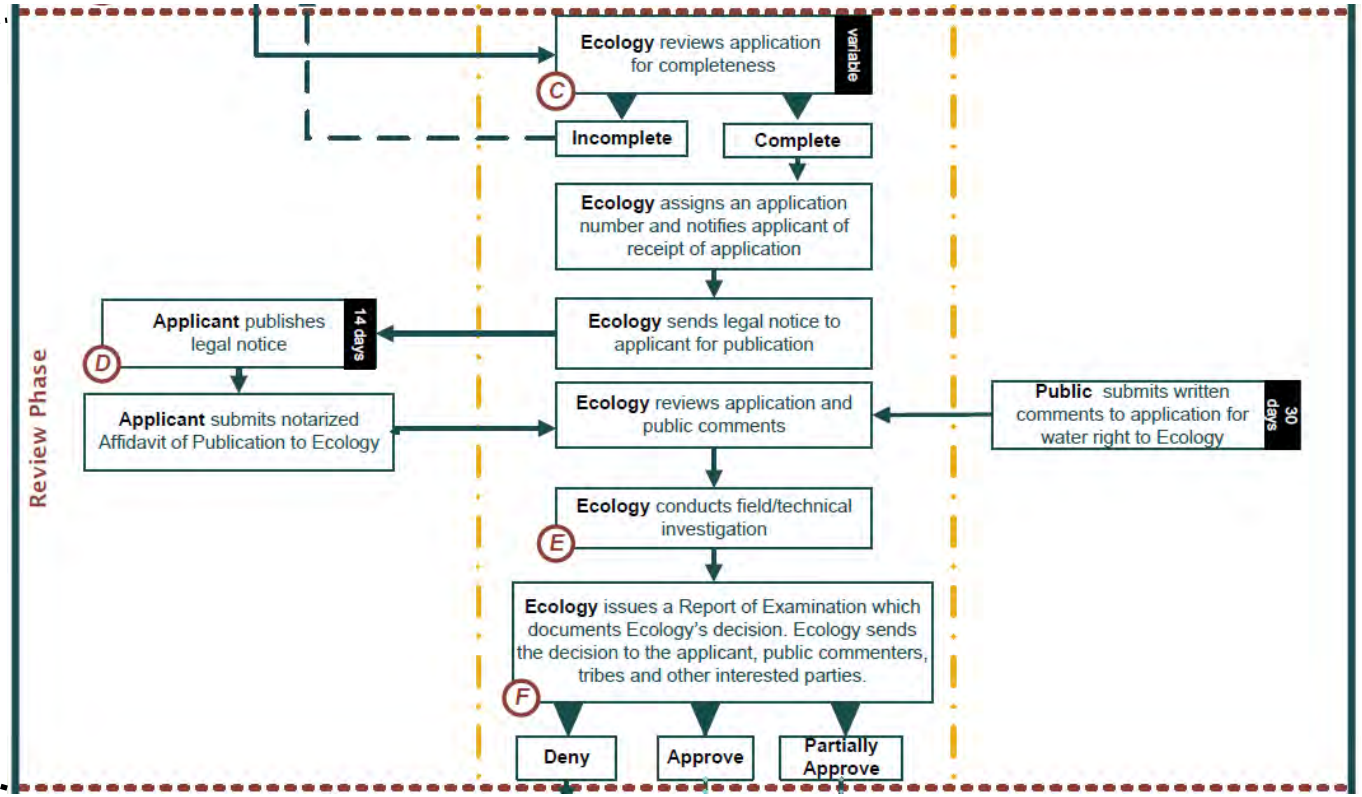
Water Availability

- There is water but how much?



New Water Right Application Process – Review



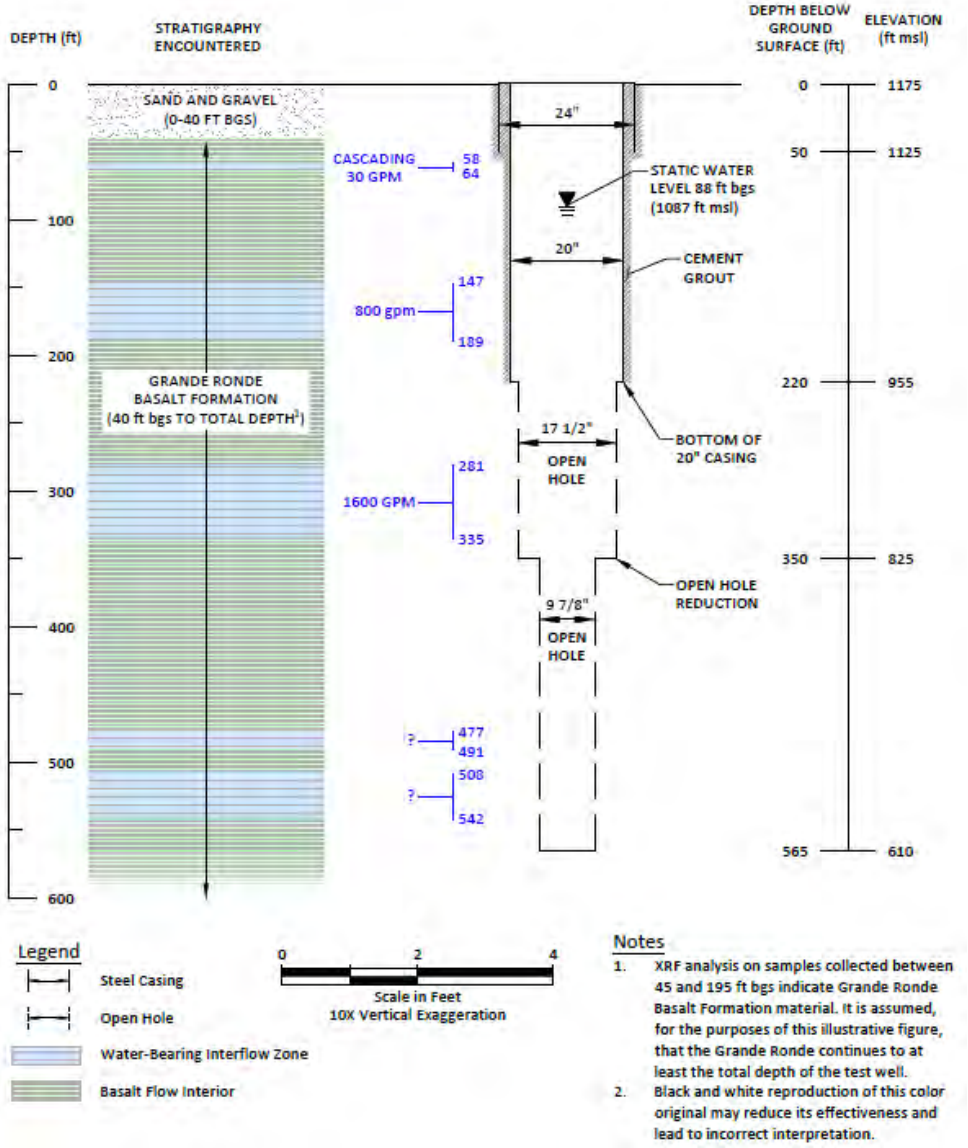


- Preliminary Permit (pumping tests)
- Report of Examination

// Review Period – Preliminary Permit – Test Well

TEST WELL

- 565 ft deep
- Grande Ronde Basalt



// Review Period – Preliminary Permit – Test Well

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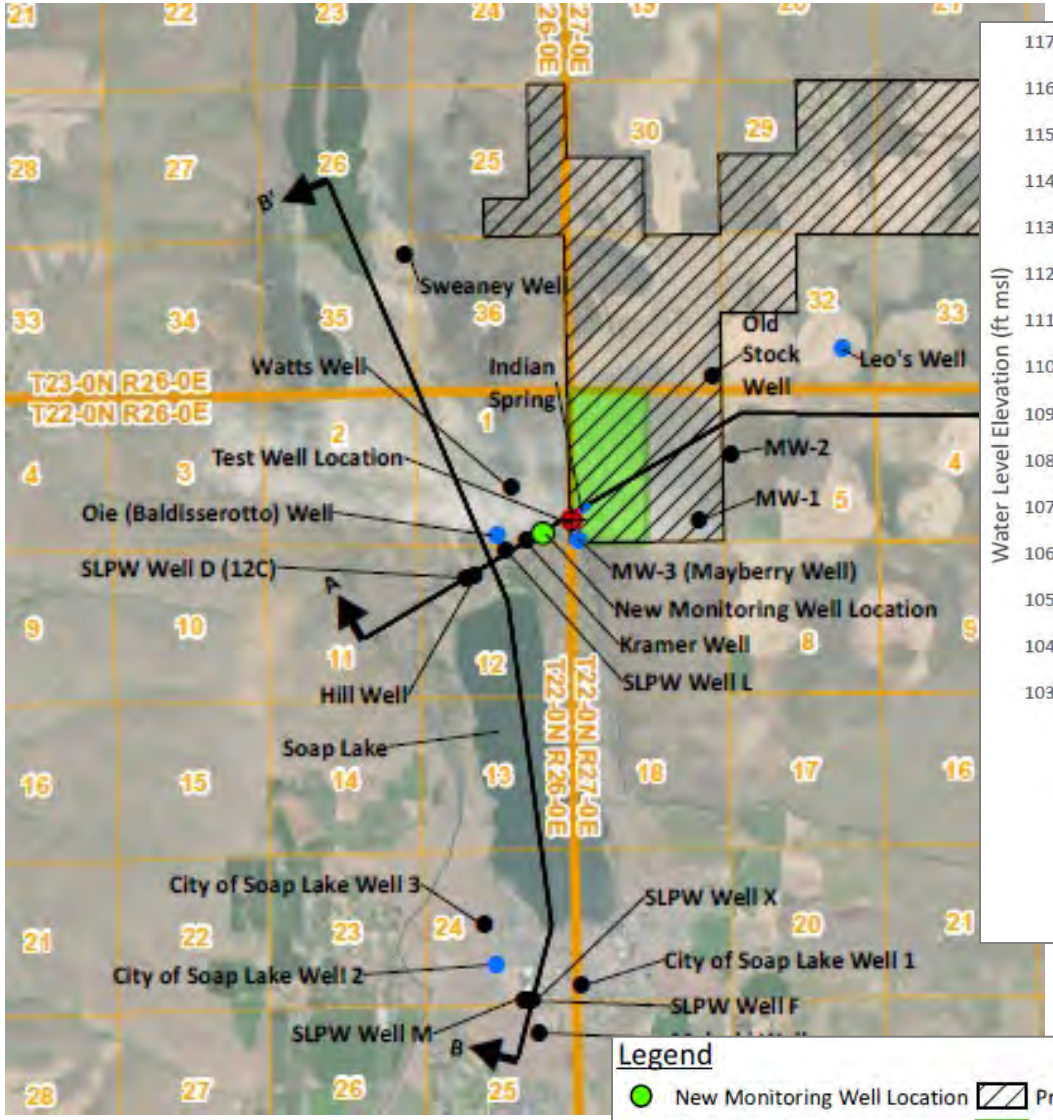
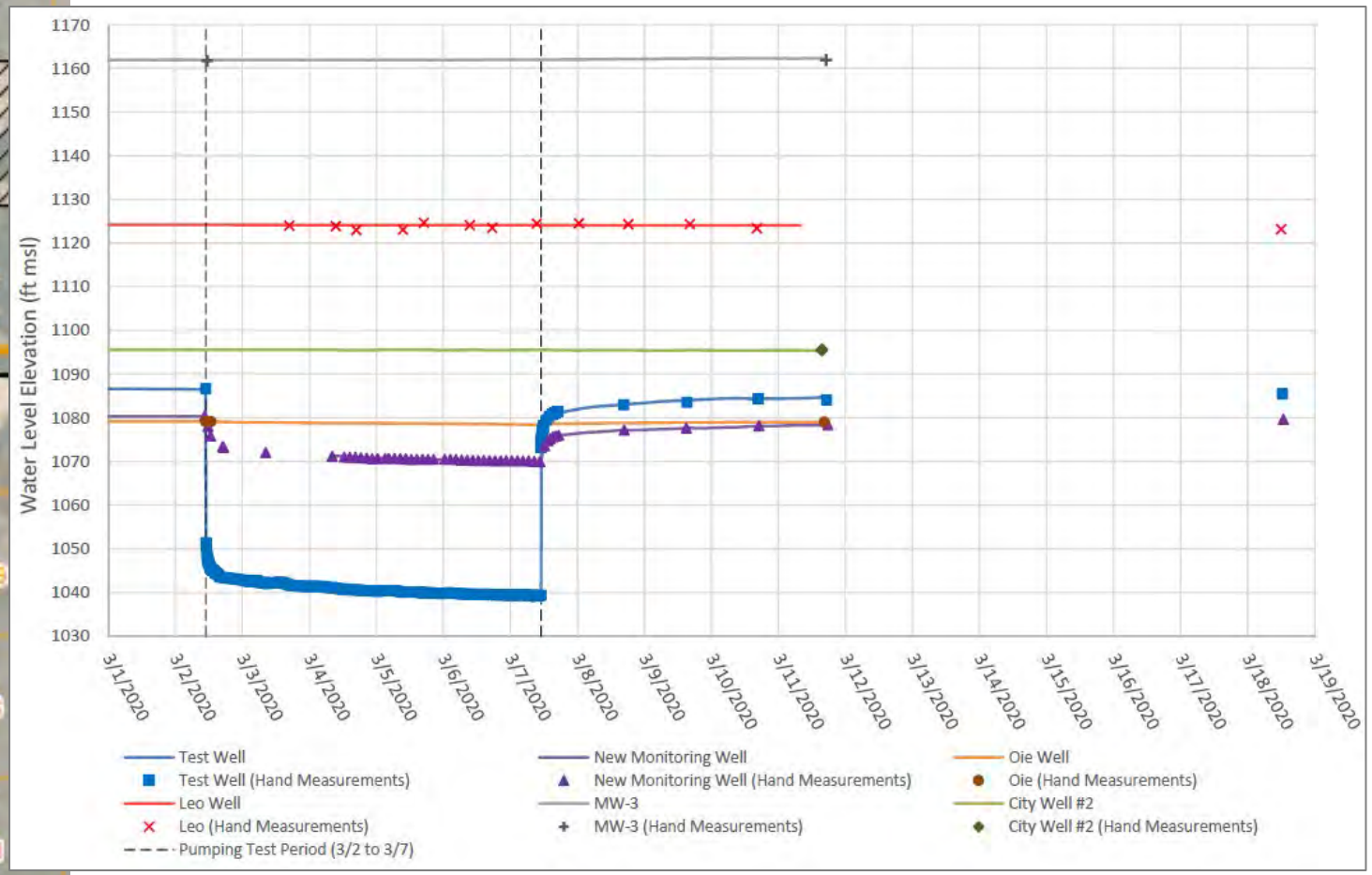
// Review Period – Preliminary Permit – Pumping Test





Two 5-Day Tests

- 2,850 gpm
- 5,200 gpm

// Review Period – Preliminary Permit – Pumping Test

Theis Aquifer Analysis

Drawdown Prediction for Confined Aquifers, Theis(1935)

Input Data for prediction of drawdown

Hydraulic conductivity, K, ft/day	700.0
Aquifer Thickness, b, ft	98
Storage Coefficient, S	1.00E-04
Pumping Rate, GPM	5200
Distance from well, ft	1050

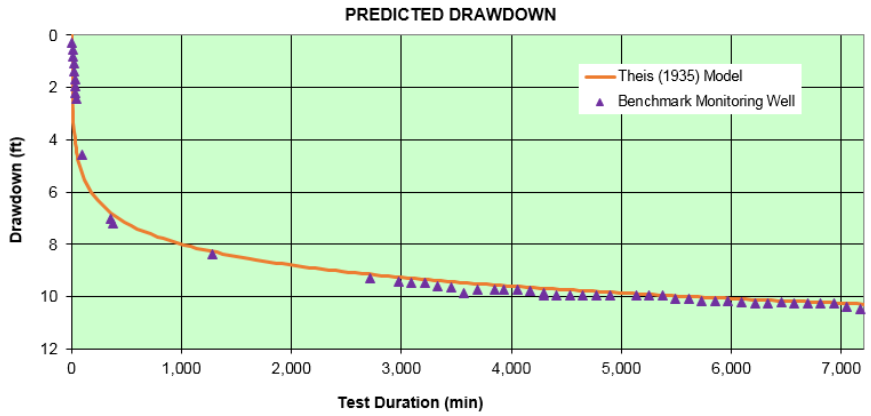
K: 0.0 | 0.1 | 1.0 | 10.0 | 100.0 | 1000.0

S: 1.00E-06 | 1.00E-05 | 1.00E-04 | 1.00E-03 | 1.00E-02 | 1.00E-01 | 1.00E+00

Equation used in prediction

$$s = \frac{Q(W(u))}{4\pi T} \qquad u = \frac{r^2 S}{4Tt}$$

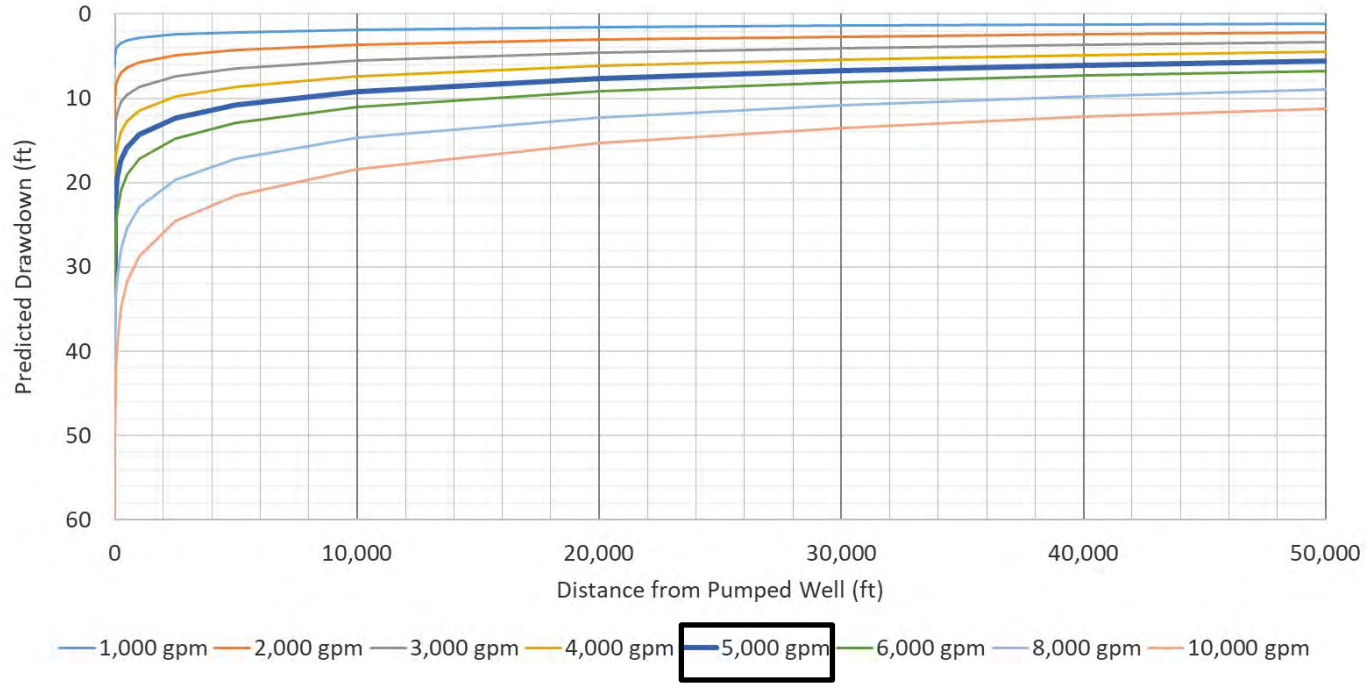
s is drawdown, W(u) is the well function



Hydraulic Conductivity = 700 ft/day

Storativity = 1×10^{-4}

Distance-Drawdown at 245 Days



5,600 acre-ft over 245-day irrigation season is about **5,200 gpm** on average

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// Review Period – SEPA

State Environmental Policy Act (SEPA)

Under chapter 197-11 WAC, a water right application is subject to a SEPA threshold determination (i.e., an evaluation of whether there will be significant adverse environmental impacts) if any of the following conditions are met:

- It is a surface water right application for more than 1 cfs, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cfs, so long as that irrigation project will not receive public subsidies;
- It is a groundwater right application for more than 2,250 gpm;
- It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above;
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA);
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

The subject application's request exceeds 2,250 gpm. Therefore, a SEPA threshold determination was completed. As Lead Agency, Ecology has determined that this proposal will not have a probable significant adverse impact on the environment and has a Determination of Non Significance issued on September 22, 2020.

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// Ecology's Report of Examination

FOUR-PART TEST

ANALYSIS

Under Washington State law (RCW 90.03.290), each of the following four criteria must be met for an application for a new water right permit to be approved:

- Water must be available for appropriation.
- Water withdrawal and use must not cause impairment of existing water rights.
- The proposed water use must be beneficial.
- Water use must not be detrimental to the public interest (public welfare).

Water Availability

For any new appropriation, water mus

Physical Availability

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and 5,600 acre-feet per year for the se
Analysis. There has been no document
area or negative impacts to existing w
water. Therefore, water is both physic

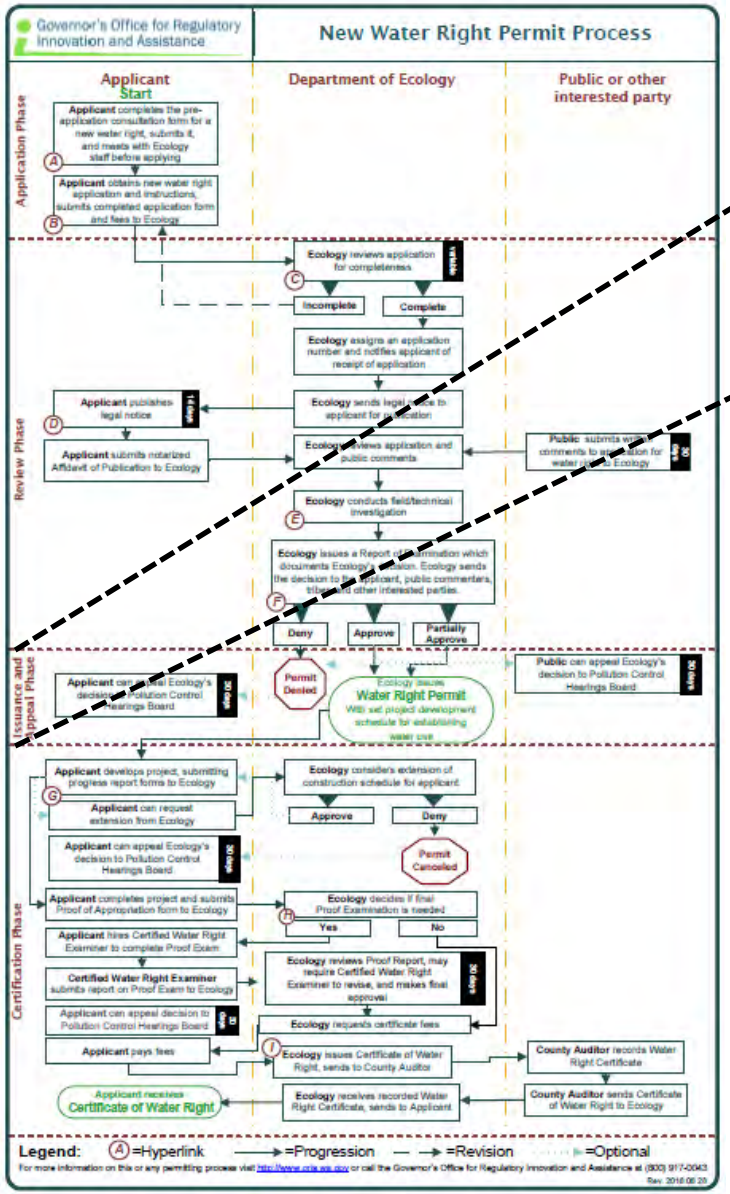
Consideration of Comments

The Department of Ecology received comments from the following party(ies):

Commenter	Date of Comment	Summary of Comment
USBR	July 29, 2020	We believe pumping groundwater from the wells in the deeper aquifer at Benchmark Farms may impact the upper, shallow aquifer that makes up the Quincy Program. It is important that large projects that have a potential to affect ground water and surface water only be allowed when diligent hydrologic studies have been completed.

No findings through this investigation indicate there would be any detrimental impact to the public welfare through issuance of the proposed appropriation.

New Water Right Application Process – Issuance and Appeal Period



- Permit

// Benchmark Farms – Permit – February 17, 2021

DEPARTMENT OF ECOLOGY
State of Washington

STATE OF WASHINGTON
PERMIT
FOR WATER RIGHT

6799705

PRIORITY DATE	WATER RIGHT NUMBER
September 21, 2016	G3-30774

NAME AND MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
Benchmark Farms, Inc. 29 Road 7 NE Ephrata WA 98823	

Total Rate and Quantity Authorized for Withdrawal

WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)
10,000	5,600

gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year

Purpose

PURPOSE	WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)	PERIOD OF USE
Irrigation	10,000	5,600	3/1 to 10/31

IRRIGATED ACRES		
1,600		

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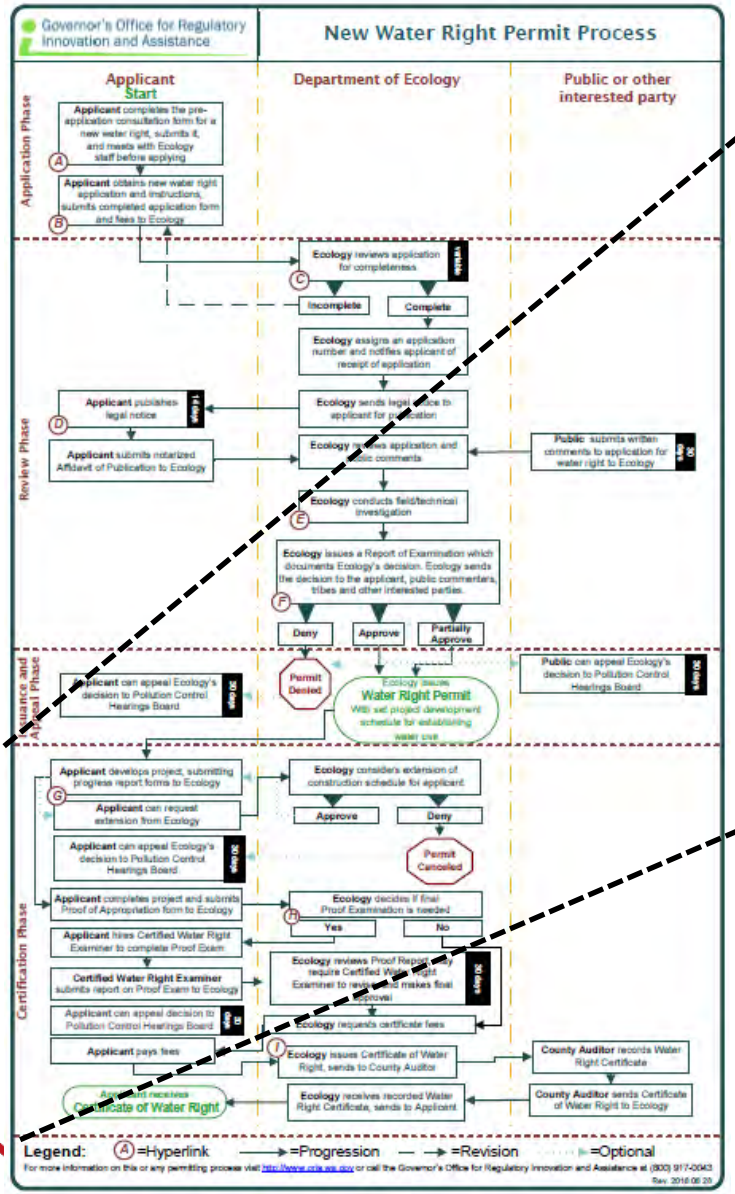
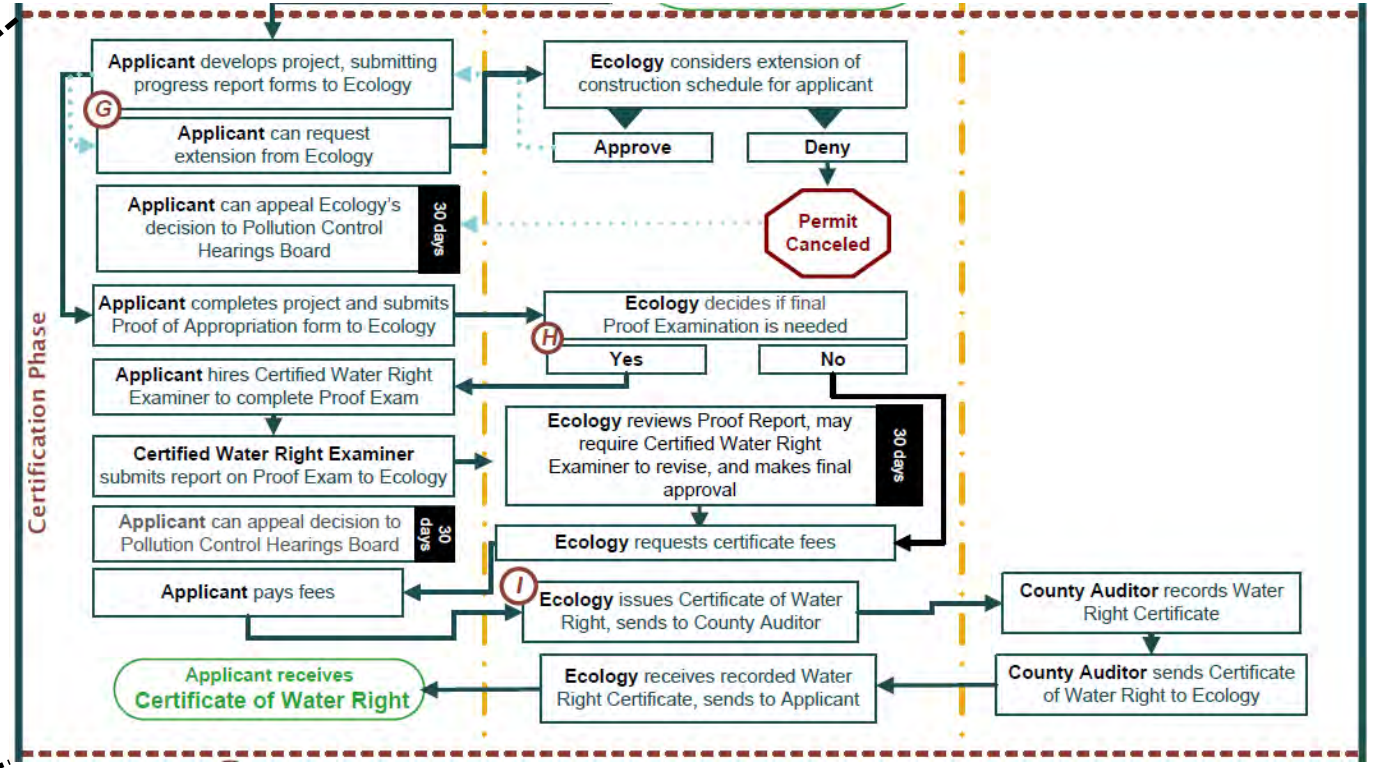
New Water Right Application Process – Certification



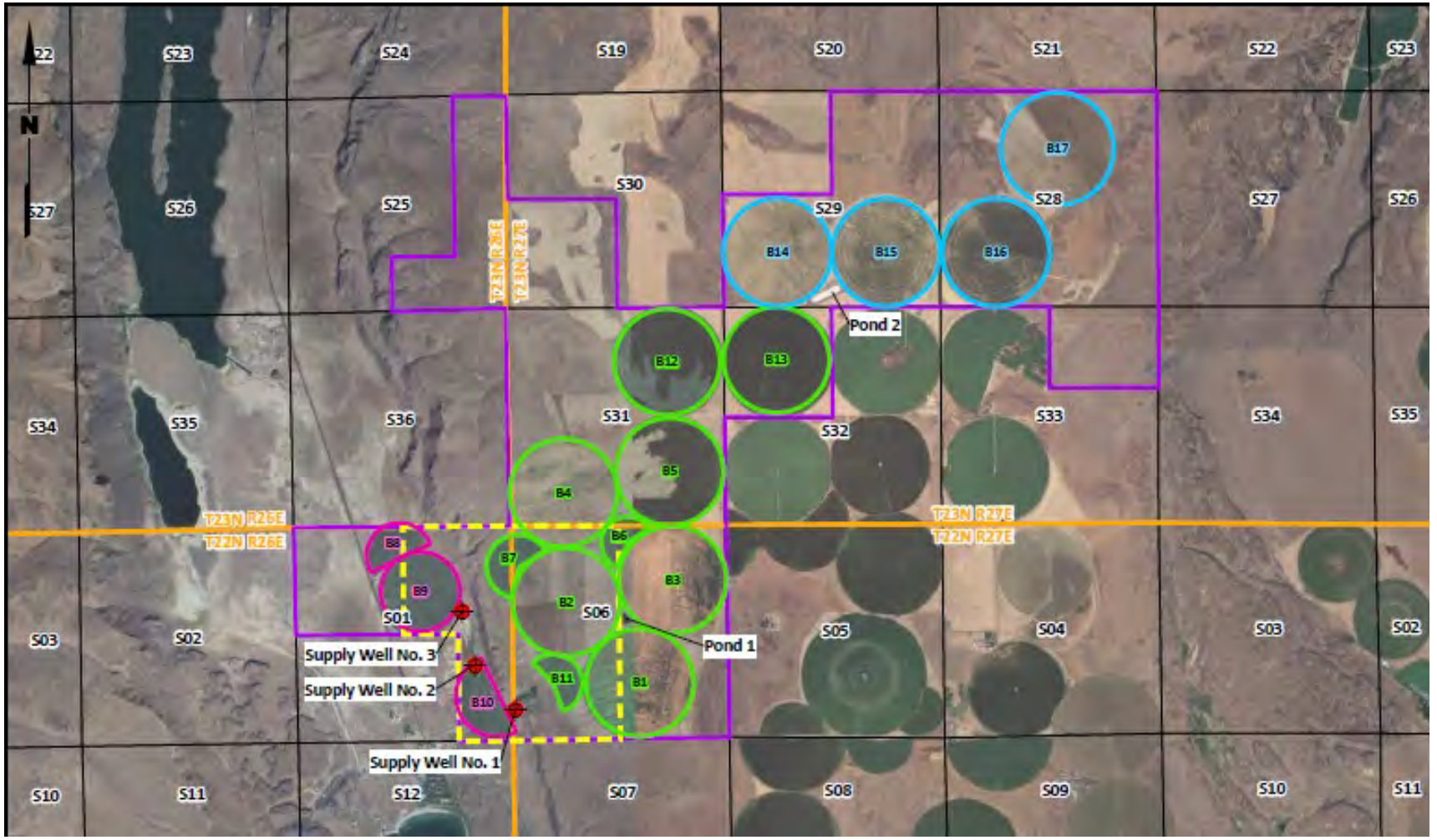


- Development/Construction
- Proof of Appropriation
- Certificate

// Benchmark Farms – Project Development

2021 TO 2023

- Three wells
- 1,600 acres
- 17 pivots



// Benchmark Farms – Project Development

2024

- Proof of Appropriation (April)
- Next step: Certified Water Right Examiner (CWRE) for Certificate

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Thank You

BEN LEE, PE, CWRE

blee@landauinc.com