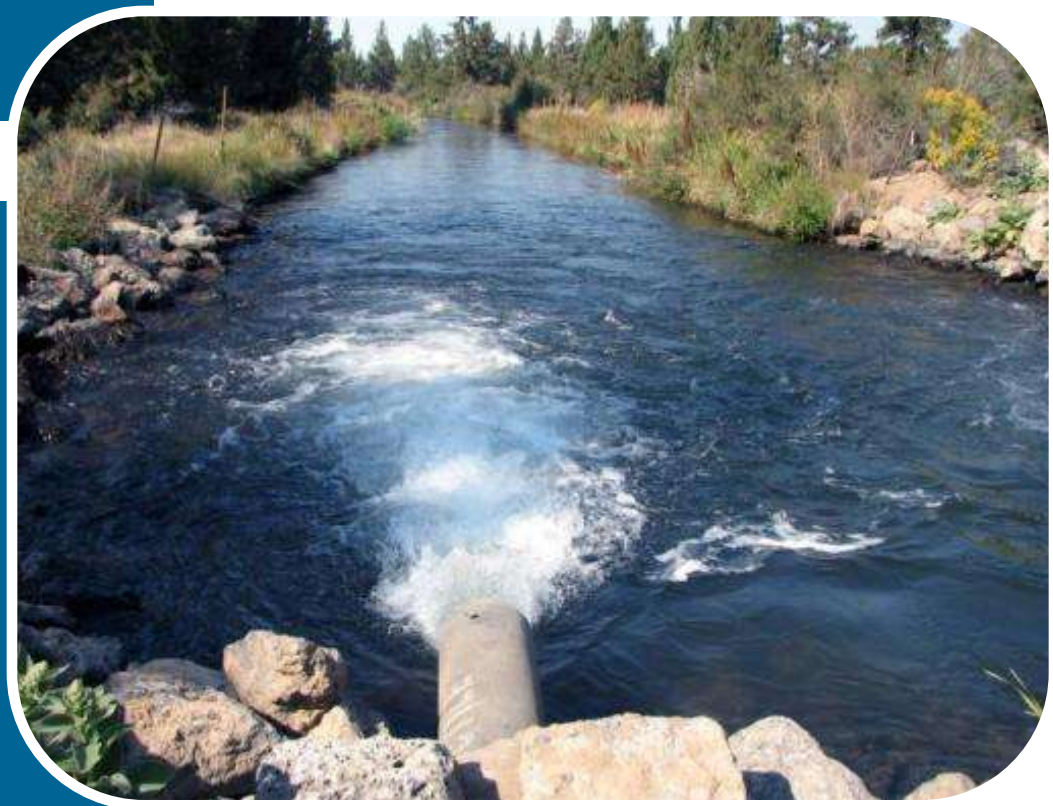


Energy Trust Hydroelectric Resource Assessments

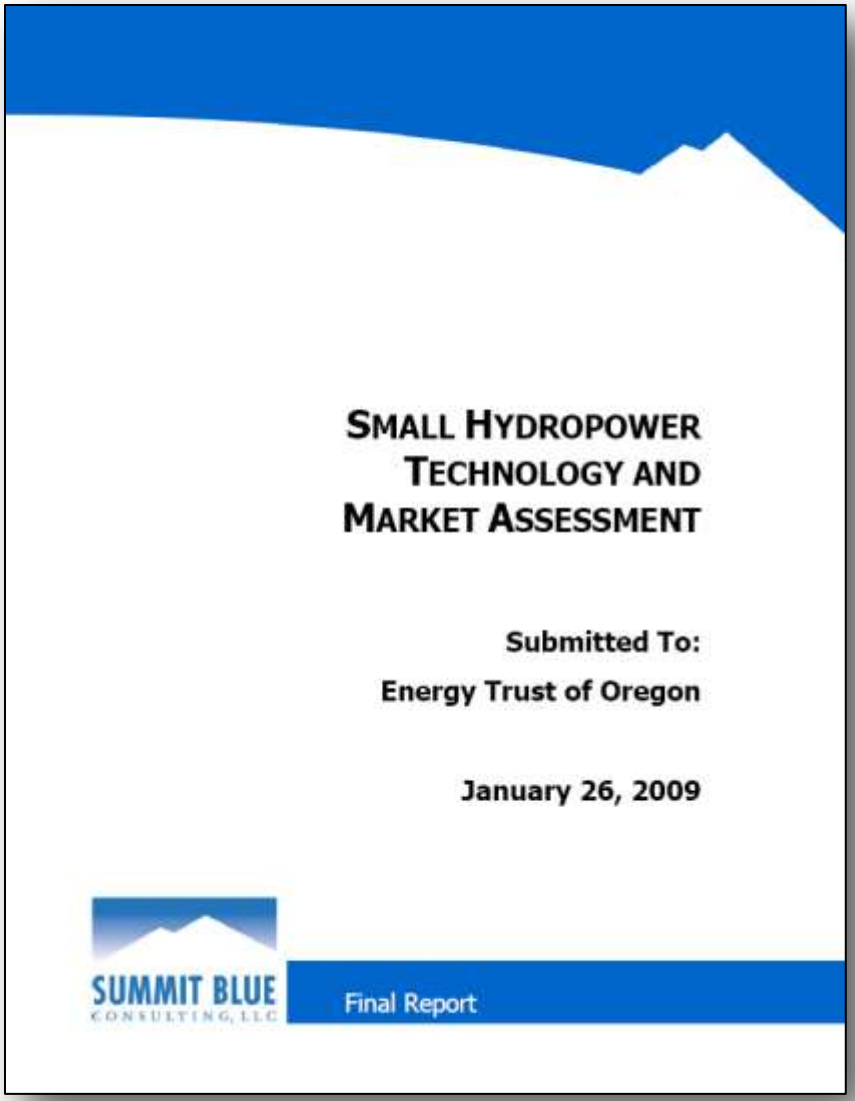
EnergyTrust of Oregon

Overview

- Energy Trust's history with the sector
- Current offerings
- Recent resource assessments

EnergyTrust of Oregon

Energy Trust’s work with the hydroelectric sector



SMALL HYDROPOWER TECHNOLOGY AND MARKET ASSESSMENT

Submitted To:

Energy Trust of Oregon

January 26, 2009

SUMMIT BLUE CONSULTING, LLC

Final Report

http://energytrust.org/library/reports/090126_Small_hydropower.pdf

EnergyTrust of Oregon

Low hanging fruit:

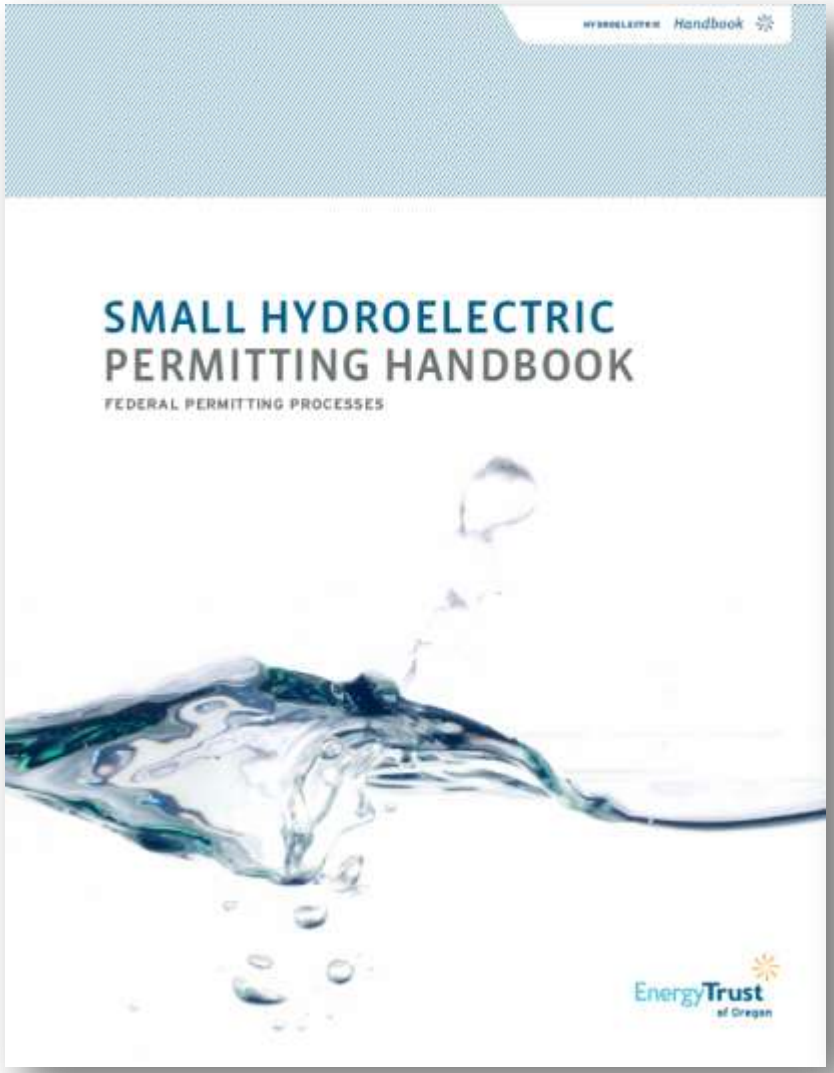
- Pressure Reduction Valves
- Canal pressurization
- Water storage facilities
- Aquifer Storage & Recovery
- Existing facility expansions

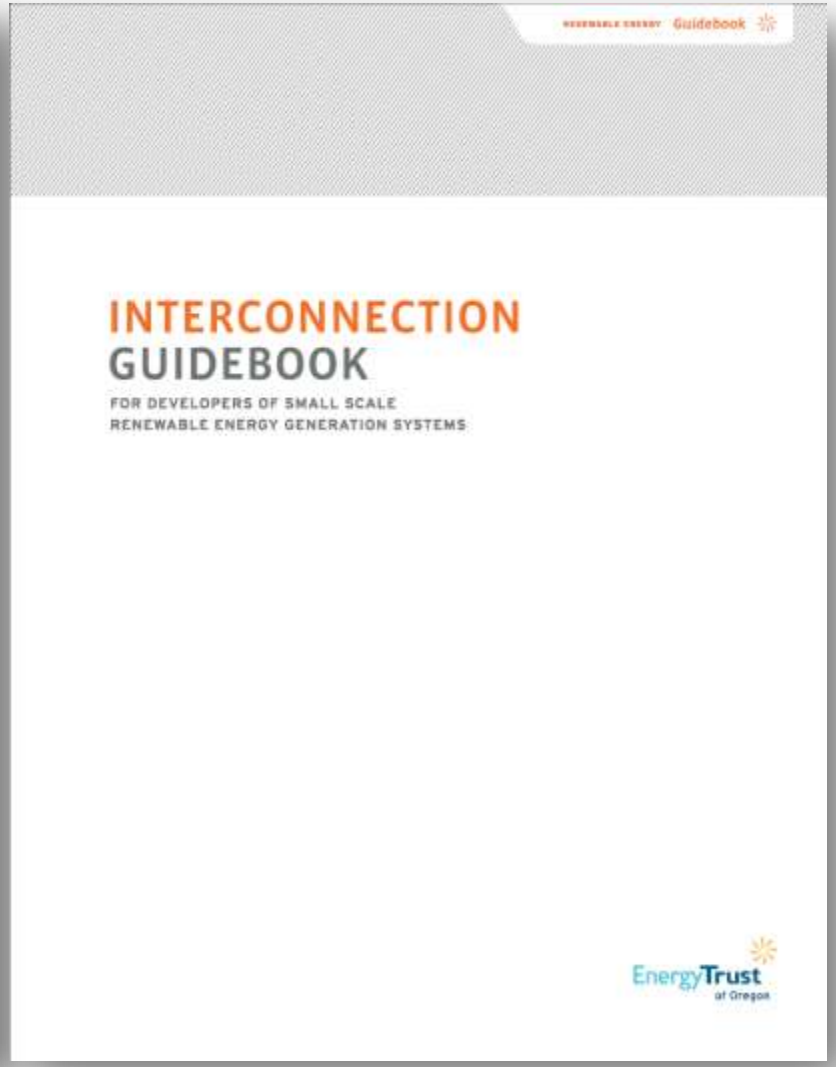
EnergyTrust of Oregon

Challenges

- Internal expertise
- Permitting (federal and state)
- Power contracts and interconnection agreements

EnergyTrust of Oregon





energytrust.org/hydro (resources tab)

EnergyTrust of Oregon

Current offerings

What we offer

- **Project development assistance**
  - Grant writing, feasibility, design, interconnection, permitting, etc.
  - 50% cost share up to $40,000
  - Paid as reimbursement

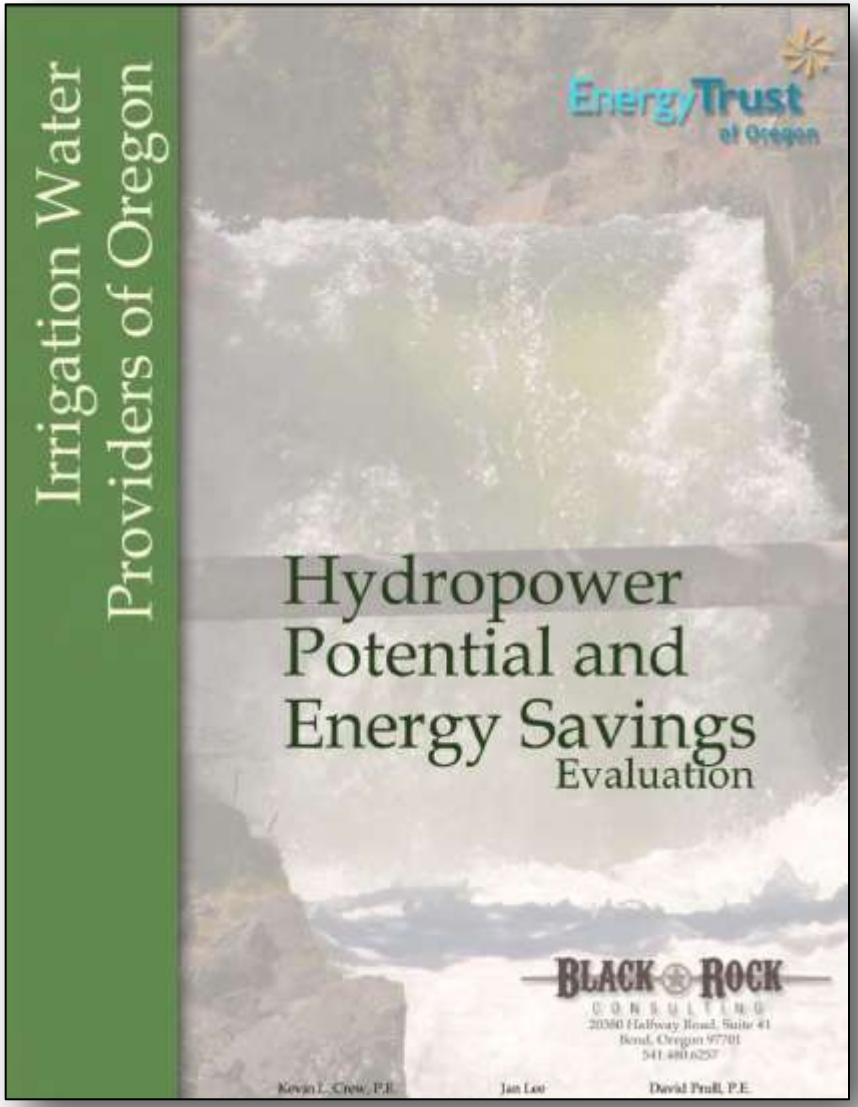
EnergyTrust of Oregon

What we offer

- **Project Incentives**
  - Based on “Above Market Costs”
  - Energy Trust takes % of project’s RECs

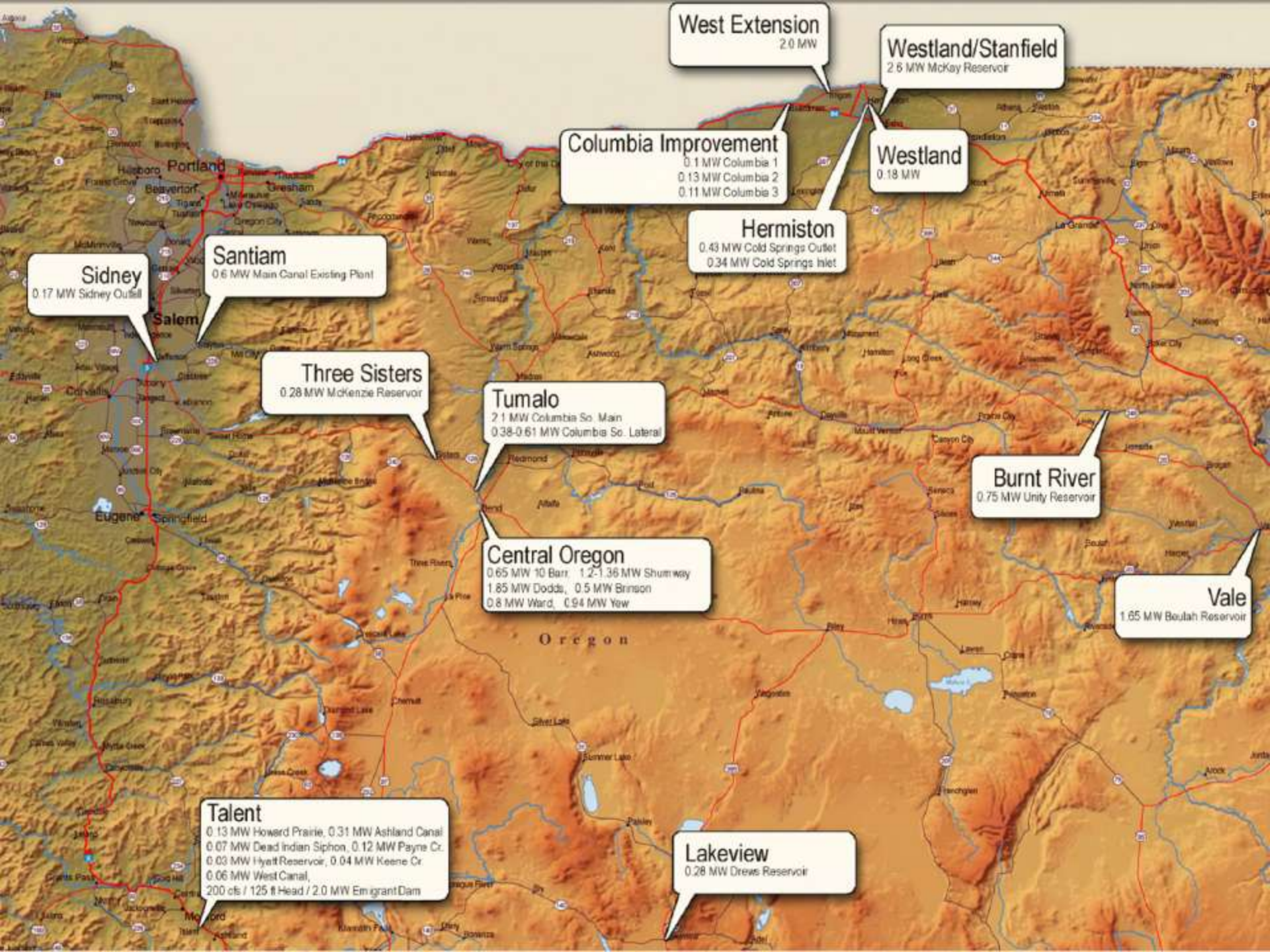
EnergyTrust of Oregon

Resource Assessments



http://energytrust.org/library/reports/100916_HydropowerPotential.pdf

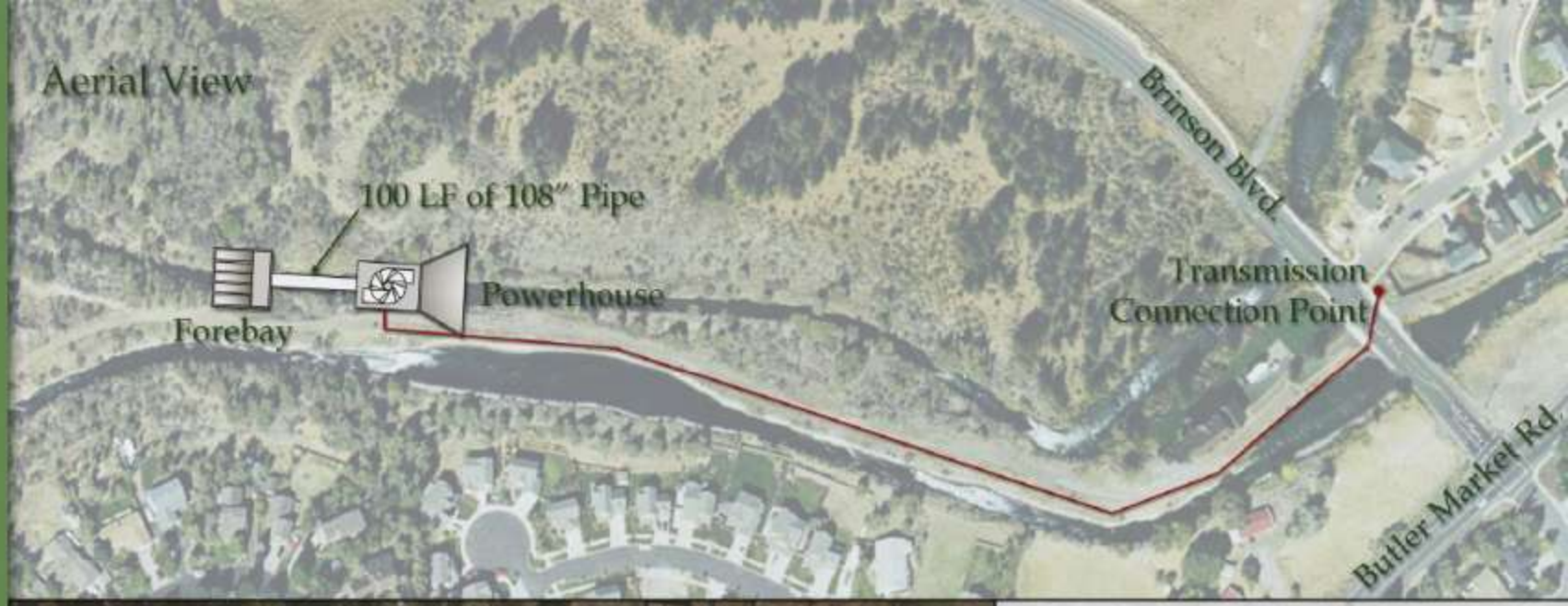
EnergyTrust of Oregon

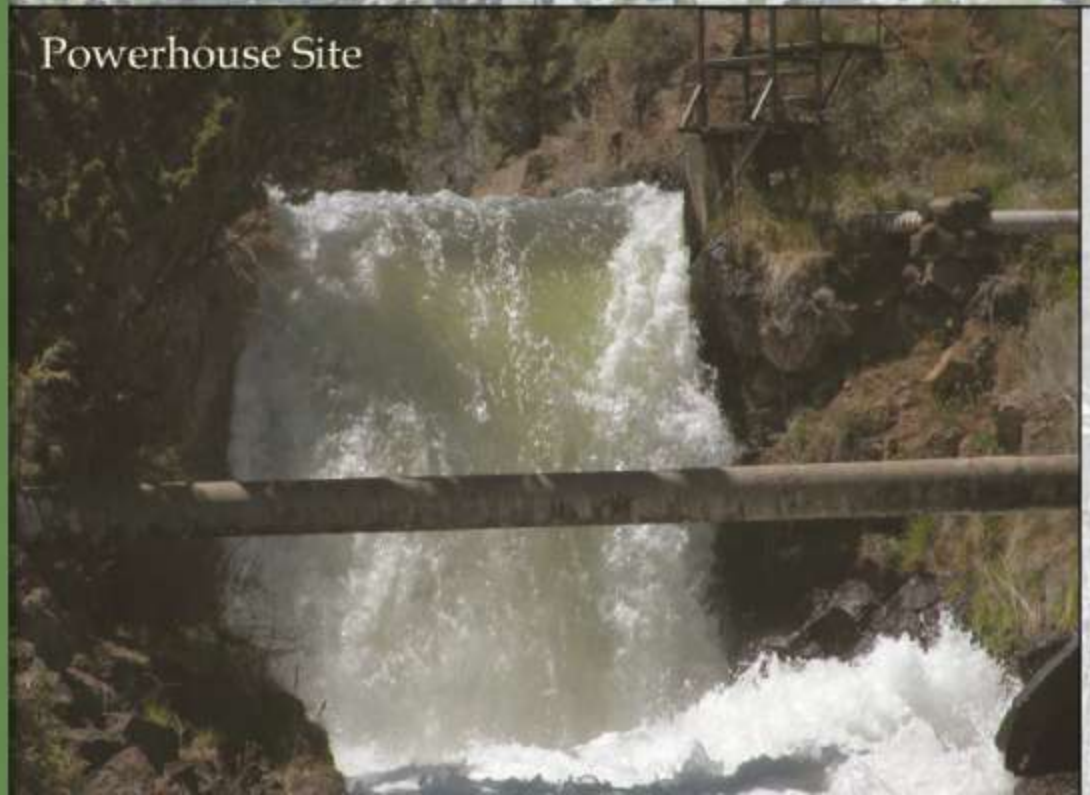

West Extension
2.0 MW
Westland/Stanfield
2.6 MW McKay Reservoir
Columbia Improvement
0.1 MW Columbia 1
0.13 MW Columbia 2
0.11 MW Columbia 3
Westland
0.18 MW
Hermiston
0.43 MW Cold Springs Outlet
0.34 MW Cold Springs Inlet
Santiam
0.6 MW Main Canal Existing Plant
Sidney
0.17 MW Sidney Outfall
Three Sisters
0.28 MW McKenzie Reservoir
Tumalo
2.1 MW Columbia So. Main
0.38-0.61 MW Columbia So. Lateral
Burnt River
0.75 MW Unity Reservoir
Central Oregon
0.65 MW 10 Barr, 1.2-1.36 MW Shumway
1.85 MW Dodds, 0.5 MW Brinson
0.8 MW Ward, 0.94 MW Yew
Vale
1.65 MW Beulah Reservoir
Talent
0.13 MW Howard Prairie, 0.31 MW Ashland Canal
0.07 MW Dead Indian Siphon, 0.12 MW Payne Cr.
0.03 MW Hyatt Reservoir, 0.04 MW Keene Cr.
0.06 MW West Canal,
200 cfs / 125 ft Head / 2.0 MW Emigrant Dam
Lakeview
0.28 MW Drews Reservoir
Portland
Beaverton
Hillsboro
Gresham
Salem
Corvallis
Eugene
Springfield
Bend
Redmond
Madras
Prineville
Oregon

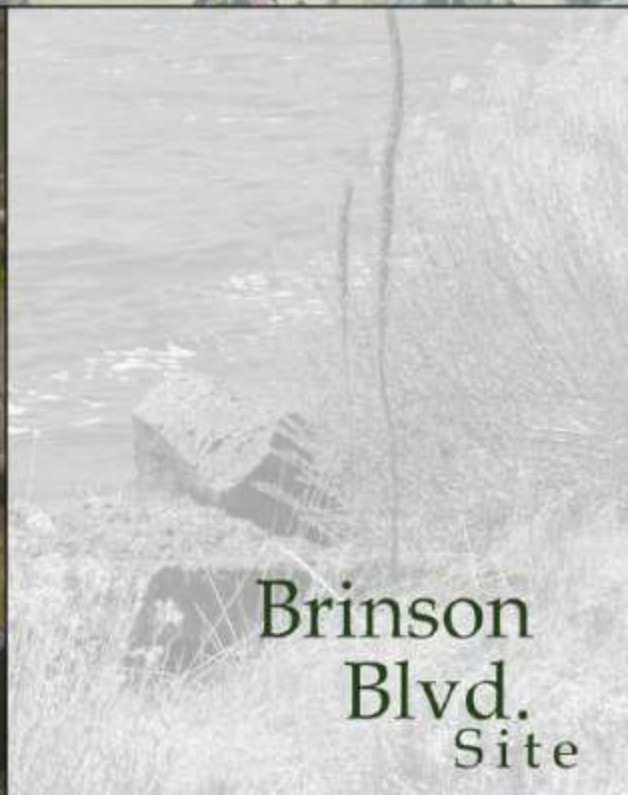
Location	Sites	Total Capacity kW
Sidney Irrigation District	1	170
Santiam Water Control District	1	600
Lakeview Water Users	1	280
Talent Irrigation District	7	2,760
Central Oregon Irrigation District	6	5,940
Three Sisters Irrigation District	1	900
Tumalo Irrigation District	2	2,500
Columbia Improvement District	3	340
West Extension Irrigation District	1	2,000
Westland Irrigation District	1	180
Hermiston Irrigation District	2	770
Westland/Stanfield Irrigation Districts	1	2,600
Burnt River Irrigation District	1	750
Vale Irrigation District	1	1,650
Total	**29**	**21,440**

EnergyTrust of Oregon

Central Oregon Irrigation District







Project Details

Water Provider:	Central Oregon Irrigation District
Contact:	Steve Johnson, Manager 1055 SW Lake Court Redmond, Oregon 97756 (541)548-6047
Interest Level:	High
Financial/Technical Ability for Project:	High (2 Existing Projects, 1 Under Construction)
Forebay Location:	lat: N44° 04' 57.49" long: W121° 17' 13.74"
Powerhouse Location:	lat: N44° 04' 57.32" long: W121° 17' 10.38"
Interconnect Utility Company:	Pacificorp
Interconnect Pole Location:	lat: N44° 04' 57.24" long: W121° 16' 51.60"
Interconnect Pole Tag Number:	17-12 221103 (1920)
Project Type:	In Main Canal. Conduit Project
Powerhouse Location Description:	In Main Canal at Coordinates Shown Above

Resource Estimates

Head:	Gross Head=20ft, Net Head=17ft
Flow:	Flow Rate Range = 200 cfs to 470 cfs Average Flow Rate = 370 cfs
Flow Annual Availability:	Irrigation Season (April through October) Possible 4 Winter Stock Runs

Power Potential Estimates

Capacity:	0.5 MW Peak
Annual Output:	2,000 MWh

Project Development/Cost Estimates

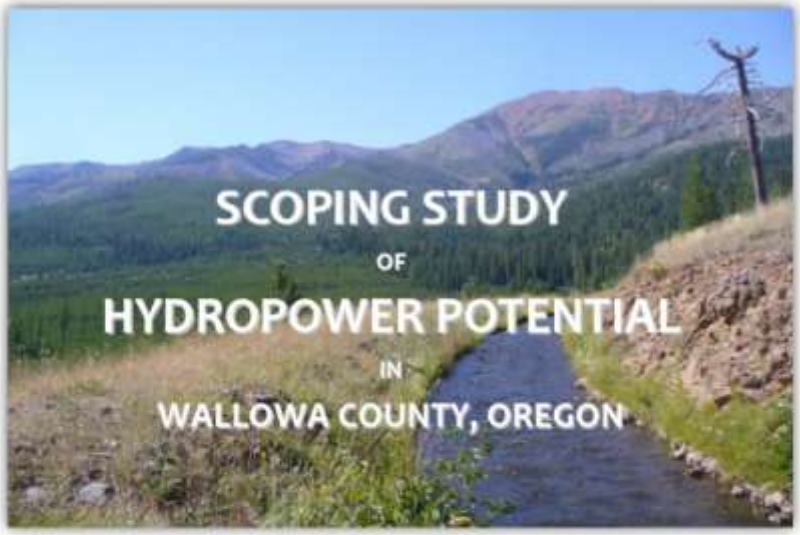
Pipe:	Length=100 LF Diameter=108 in. Cost=$118,800.00
Powerhouse	$500,000.00
Civil Works:	$200,000.00
Turbine/Generator/Controls	$600,000.00
Transmission	Length=1,525 LF Cost=$215,736.00 Possible Split with NUID
Design/Permitting:	$98,072.00
10% Contingency:	$173,261.00
Total:	$1,905,869.00

Potential Fatal Flaws or Issues of Concern

No known fatal flaws.

Issues of concern: Land Use Permitting.

Brinson



SCOPING STUDY OF HYDROPOWER POTENTIAL IN WALLOWA COUNTY, OREGON

For

Energy Trust of Oregon

November 2010

Prepared by Renewable Energy SOLUTIONS, LLC

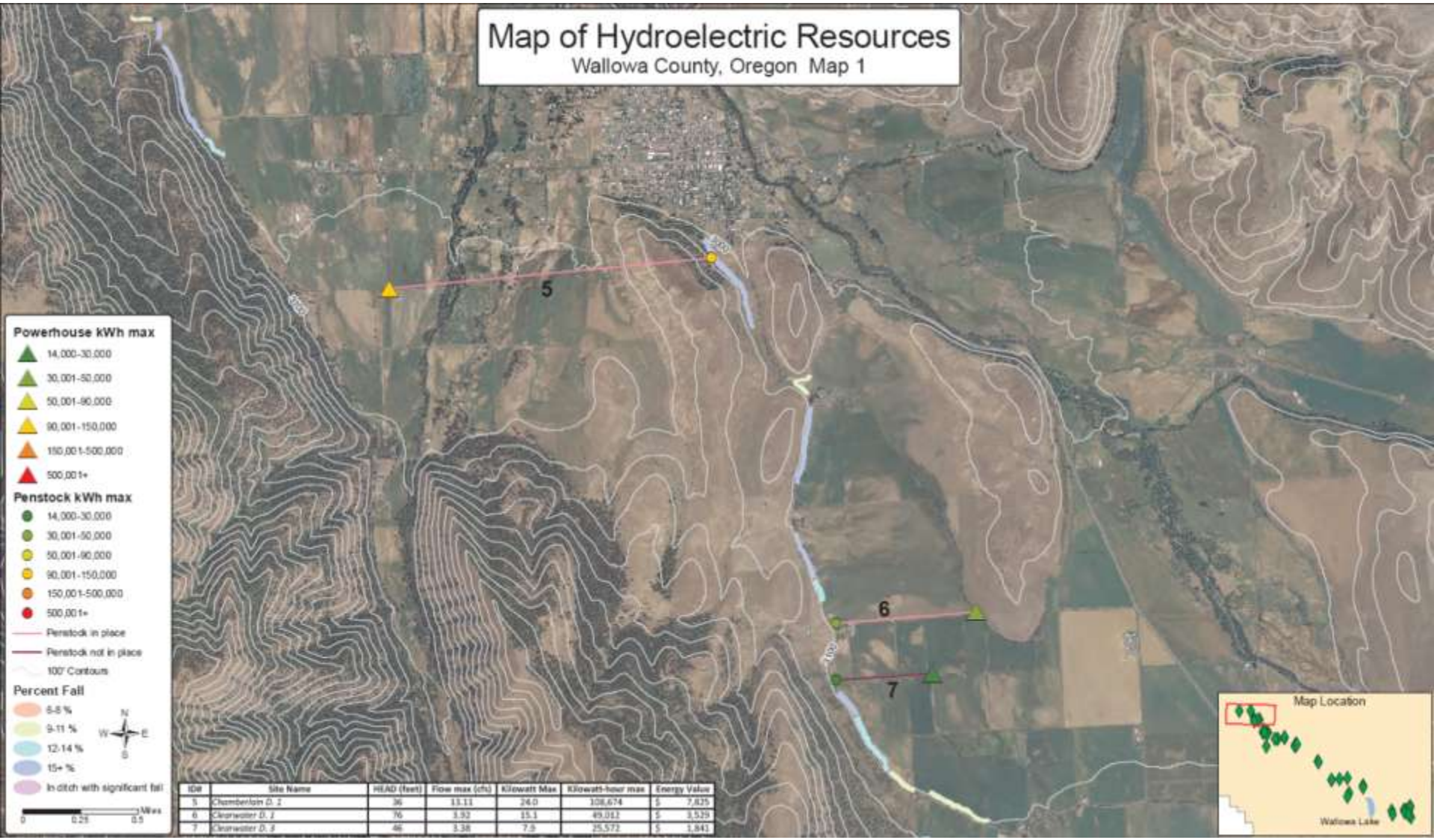
PO Box 156, Enterprise, Oregon 97828
p 541.426.4100
www.renewablesolutionsllc.com

http://energytrust.org/library/reports/101120_Wallowa_Mapping2.pdf

EnergyTrust of Oregon

Map of Hydroelectric Resources

Wallowa County, Oregon Map 1



ID#	Site Name	HEAD (feet)	Flow max (cfs)	Kilowatt Max	Kilowatt-hour max	Energy Value
5	*Chamberlain D. 1*	36	13.11	24.0	108,674	$ 7,835
6	*Clearwater D. 1*	76	3.92	15.1	49,012	$ 3,529
7	*Clearwater D. 3*	46	3.38	7.9	25,572	$ 1,841

EnergyTrust of Oregon

ID#	Site Name	HEAD (feet)	Flow max (cfs)	Kilowatt Max	Kilowatt-hour max	Energy Value
1	*Alder Slope D. 1*	100	2.50	12.7	41,118	$ 2,961
2	*Allen Canyon D. 1*	304	7.00	108.0	349,998	$ 25,200
3	*Arrowhead Pipeline Association 1*	374	0.47	8.9	28,781	$ 2,072
4	*Arrowhead Pipeline Association 2*	462	1.15	27.1	87,696	$ 6,314
5	*Chamberlain D. 1*	36	13.11	24.0	108,674	$ 7,825
6	*Clearwater D. 1*	76	3.92	15.1	49,012	$ 3,529
7	*Clearwater D. 3*	46	3.38	7.9	25,572	$ 1,841
8	*Creighton D. 1*	40	3.00	6.1	19,737	$ 1,421
9	*Cross Country Canal 1*	16	30	24.4	78,947	$ 5,684
10	*Kinney Lake D. 1*	186	7.75	73.2	237,087	$ 17,070
11	*Kinney Lake D. 2*	49	17.5	43.5	141,035	$ 10,155
12	*Kinney Lake D. 3*	25	17.5	22.2	71,957	$ 5,181
13	*Kinney Lake D. 4*	33	17.5	29.3	94,983	$ 6,839
14	*McCully Creek 1*	128	1.98	12.9	41,684	$ 3,001
15	*Moonshine D. 1*	239	3.762	45.6	147,802	$ 10,642
16	*Prairie Creek. 1*	319	7.75	125.5	406,617	$ 29,276
17	*Sheep Creek D. 1*	220	35.00	390.9	1,266,439	$ 91,184
18	*Sheep Ridge D. 1*	222	0.45	5.0	16,270	$ 1,171
19	*Sheep Ridge D. 2*	152	0.84	6.5	21,000	$ 1,512
20	*West Side D. 1*	201	1.01	10.3	33,390	$ 2,404
21	*West Side D. 2*	92	2.00	9.3	51,447	$ 3,704
22	*West Side D. 3*	197	1.3	13.0	71,606	$ 5,156
	TOTAL			*1021.4*	*3,390,852*	*$ 244,142*

EnergyTrust of Oregon

Site: CHAMBERLAIN DITCH 1

Chamberlain D.1

Site & Contact

Site Name	Chamberlain D.1
Ditch Name	Chamberlain Ditch
Ditch Company	Chamberlain Ditch Company
Contact Phone d/m	Glade Jackson, 541 886 8721

Site Location

Powerhouse		Penstock	
Latitude	45.33781N	Latitude	45.33850N
Longitude	117.33401W	Longitude	117.31660W

Resource Details

Water Right no.	80877, 80878	Return Flow Chamberlain Ditch	
Head (feet)	36	Pipe Diameter/inches	30"

Pipe In Place? ☒ Yes ☐ No Notes - This is an existing pipe located on the South end of Wallowa. It runs west for a total of 1.5 miles and exhausts into Chamberlain Ditch. It starts at 42" diameter and reduces to 30" diameter after 1 mile.

Flow Max (cfs)	13.11	Flow Min (cfs)	3.39
kWh Max	208,674	kWh Min	20,088
kW Max	24	Distance to transmission	1347
Annual Revenue Max	$7,826	Pipe Length (feet) 7917	

Project Costs

Pipeline Costs	n/a
Powerhouse Costs	$13,000
Turbine / Gen Set Costs	$145,000
Install Costs	$26,484
Permitting Costs	$12,700
Feasibility & Engineering	$21,200
Interconnection	$44,525
TOTAL COST	$261,909

Notes –
This is an existing pipe located on the South end of Wallowa. It runs west for a total of 1.5 miles and exhausts into Chamberlain Ditch.

The pipe begins as 42" diameter and reduces to 30" diameter after 1 mile.

EnergyTrust of Oregon