

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF121 ESTIMATE LEVEL: Feasibility
	REGION: MP UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\JC Boyle\Klamath Dams Removal - JC Boyle - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	5	Remove Spillway Concrete 3000 psi, reinforced and mass concrete. Includes removal of two diversion culverts beneath spillway block 1. Spillway concrete was estimated between dam Sta. 2+19.5 and Sta. 3+36.5. Waste in scour hole	86-68130	2,500	yd3	\$260.00	\$650,000.00
	6	Remove Monorail Structural Steel Components This structure used for installing steel stoplogs in spillway radial gate openings. Assume contains paint with heavy metals.	86-68130	15,000	lbs	\$0.65	\$9,750.00
	7	Remove Fish Ladder Concrete 3000 psi, reinforced concrete. Includes fish ladder intake at upstream end, diffusion box at downstream end, and north abutment wall (which supports dam embankment). This quantity is for concrete to the right of dam Sta. 3+36.5. Waste in scour hole	86-68130	1,600	yd3	\$260.00	\$416,000.00
	8	Remove Gravity Dam Section Concrete 3000 psi, mass concrete. Waste in scour hole	86-68130	600	yd3		DELETED
	9	Remove Timber Equipment Ramp on left side of dam. Timber is creosote pressure treated Douglas Fir assumed to weigh 36 lbs/ft3. Volume of timber to be removed is approximately 290 ft3.	86-68130	10,500	lbs	\$0.55	\$5,775.00
	10	Remove Pressure-Treated Lumber from Footbridge around intake structure. 2 in by 8 in Lumber assumed to weigh 30 lb/ft3. Volume of lumber to be removed is approximately 120 ft3.	86-68130	3,600	lbs	\$0.55	\$1,980.00
SUBTOTAL THIS SHEET							\$1,083,505.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED 11/17/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE Dad 4/22/11

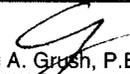
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		CIVIL					
		Concrete and Structural Steel Items:					
	11	Storage Shed located on access road about 440' from left abutment of dam. 48' x 36' wood frame construction.	86-68130	1,728	ft2		DELETED
	12	Warehouse located on access road about 370' from left abutment of dam (Red Barn). 60' x 32' wood frame construction.	86-68130	1,920	ft2		DELETED
	13	Fire System Control Bldg. on left abutment. 15.25'x25.25' concrete block on concrete slab.	86-68130	385	ft2	\$40.00	\$15,400.00
	14	Dam Communication Bldg. on left abutment. 13.5'x24.5' metal building on concrete slab.	86-68130	331	ft2	\$40.00	\$13,240.00
	15	Concrete Slab on left abutment for former Control House. 13'x13' house has been removed. Waste in scour hole	86-68130	6	cy	\$260.00	\$1,560.00
	16	4'x5' Metal Hatch on top of Concrete Pull Box on left abutment. Metal hatch weighs approximately 400 lbs. Waste in scour hole	86-68130	1	cy	\$260.00	\$260.00
	17	Reservoir Level Gauge House on Dam Crest 4'x6' Metal building.	86-68130	24	ft2	\$40.00	\$960.00
SUBTOTAL THIS SHEET							\$31,420.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
	18	Upstream Riprap <i>average size 50 lbs (from photograph)</i>	86-68313	2,220	yd3	\$9.00	\$19,980.00
	19	Downstream Riprap <i>average size 50 lbs (from photograph)</i>	86-68313	1,850	yd3	\$9.00	\$16,650.00
	20	Miscellaneous Excavation <i>Consists of finer earth fill materials such as Zone 1, Zone 2, Filters and a Waste Rock Zone</i>	86-68313	132,500	yd3	\$9.00	\$1,192,500.00
	21	Cutoff Wall Concrete Demolition <i>The concrete cutoff wall is embedded in the Zone 1 core and is anchored into bedrock. Waste in scour hole</i>	86-68313	70	yd3	\$260.00	\$18,200.00
	22	Cutoff Wall Anchors <i>Cut #8 anchors at top of bedrock Assume concrete rubble disposed of on site but anchors hauled off site.</i>	86-68313	285	ea	\$10.00	\$2,850.00
		SUBTOTAL THIS SHEET					\$1,250,180.00

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY  Craig A. Grysh, P.E.	CHECKED 
DATE PREPARED 11/12/10	PEER REVIEW / DATE Daniel W. Osmun 12/20/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

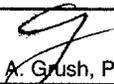
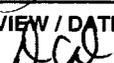
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at Dam:					
	23	Hand Rails and Light Poles (Assume contains paint with heavy metals)	86-68420	5,000	lbs	\$0.65	\$3,250.00
	24	Spillway Radial Gates and Hoists 3 radial gates, 3 hoists (Assume contains paint with heavy metals & petroleum products)	86-68420	124,000	lbs	\$0.65	\$80,600.00
	25	Stop Logs and Slots (steel) stop logs slots embedded in concrete (Assume contains paint with heavy metals)	86-68420	92,000	lbs	\$0.65	\$59,800.00
		Remove and dispose of the following equipment at the Fish Ladder Structure:					
	26	24" Slide Gate at Entrance to Fish Ladder Structure (Assume contains paint with heavy metals & petroleum products)	86-68420	4,200	lbs	\$0.65	\$2,730.00
	26A	Remove Petroleum Products from Red Barn Area Includes quantities for the following: Steel shed oil storage drums. Misc. oil products, approx. 2 drums @ 55 gal. Convault fuel tanks. Diesel fuel tank @ 500 gal., Gasoline tank @ 1,000 gal. Tanks to remain on-site.	86-68420	1,600	gal	\$10.00	\$16,000.00
SUBTOTAL THIS SHEET							\$162,380.00

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY  Craig A. Grush, P.E.	CHECKED 
DATE PREPARED December 9, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	27	Spillway gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$600.00	\$600.00
	28	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$6,000.00	\$6,000.00
		DAM SUBTOTAL					\$2,534,085.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED 
DATE PREPARED November 12, 2010	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

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		CIVIL					
		Concrete and Structural Steel Items:					
	29	Remove Powerhouse Concrete down to Elevation 3324.0 (springline of the turbines). Waste in scour hole	86-68130	1,500	yd3		DELETED
	30	Remove Structural Steel Items associated with Powerhouse. Includes only WF beam shapes, crane rails, and penstock sections inside powerhouse. Assume contains paint with heavy metals.	86-68130	94,000	lbs		DELETED
	31	Warehouse near Powerhouse. Large metal building on concrete slab.	86-68130	5,200	ft2	\$40.00	\$208,000.00
		SUBTOTAL THIS SHEET					\$208,000.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grish, P.E.	CHECKED 
DATE PREPARED 11/17/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE ACD 4/22/11

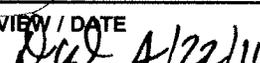
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at the Power House:					
	32	2- Governor oil systems governor, sump tanks, accumulator tank, piping (Assume contains paint with heavy metals & petroleum products)	86-68420	52,500	lbs		DELETED
	33	Cooling water and bearing oil systems (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lbs		DELETED
	34	2- Francis Turbines (Includes runner, scroll case, draft tube and shaft) (Assume contains paint with heavy metals & petroleum products)	86-68420	560,000	lbs		DELETED
	35	150 Ton crane (Includes crane and embedded steel rail) (Assume contains paint with heavy metals & petroleum products)	86-68420	240,000	lbs	\$0.65	\$156,000.00
	36	Compressed Air systems (Assume contains paint with heavy metals & petroleum products)	86-68420	1,100	lbs		DELETED
	37	2- CO2 systems (Assume contains paint with heavy metals & petroleum products)	86-68420	6,600	lbs		DELETED
	38	Plant Water and Fire Protection (Assume contains paint with heavy metals)	86-68420	3,100	lbs		DELETED
	39	Transformer Oil Fire protection (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lbs		DELETED
SUBTOTAL THIS SHEET							\$156,000.00

QUANTITIES		PRICES	
BY T. J. Tumage	CHECKED K. Converse	BY Craig A. Gush, P.E.	CHECKED
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	40	Unwatering Piping (Assume contains paint with heavy metals)	86-68420	33,000	lbs		DELETED
	41	Drainage Piping (Assume contains paint with heavy metals)	86-68420	10,000	lbs		DELETED
	42	2 Oil Sump pumps (Assume contains paint with heavy metals & petroleum products)	86-68420	2,000	lbs		DELETED
	43	Remove and Dispose of Draft Tube Bulk Head Gates and Hoists at the Powerhouse 4 Draft Tube Bulk Head Gates (12,000 lbs ea.) 4 Guides (2,400 lbs for the pair) 2 Hoist (3,700 lbs ea.) (Assume contains paint with heavy metals & petroleum products)	86-68420	65,000	lbs		DELETED
	43A	Remove Petroleum Products from Mechanical Equipment. Includes quantities for the following equipment: From Item 34, Units 1 & 2, bearing oil systems. DTE heavy oil, 400 gal. per unit, 800 gal. total. From Item 32, Units 1 & 2, governor oil sumps and accumulator tanks. Hydraulic oil, 925 gal. per unit, 1,850 gal. total. The remaining items contain petroleum products in amounts too small to be considered for this level of estimate.	86-68420	2,700	gal	\$10.00	\$27,000.00
SUBTOTAL THIS SHEET							\$27,000.00

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED December 9, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	44	Outdoor Vertical AC Generator, Unit 1: 53 MVA (50 MW); Unit 2: 50 MVA (48 MW); 0.95PF, 11,500 V, 277 RPM, 3 Ph, including rotating exciter Total weight each approximately: 657,000 lbs. Stator: 175,000 lbs., Rotor: 290,000 lbs. Heaviest lift: 300,000 lbs.	86-68430	2	EA	\$200,000.00	\$400,000.00
	45	Excitation equipment for 53/50 MVA Generator (5 cabinets)(400 lbs each), 3 ft x 3ft x 90 inches high. Total weight approximately: 2,000 lbs.-	86-68430	2	EA		DELETED
	46	Surge protection equip. for 53/50 MVA Generator Total weight approximately: 1,500 lbs.-	86-68430	2	EA		DELETED
	47	Neutral grounding equip. for 53/50 MVA Generator includes transformer Total weight approximately: 500 lbs.-	86-68430	2	EA		DELETED
	48	Generator Switchgear, 15kV (6 sections) (750 lbs each), 3 ft x 6ft x 90 inches high. Total weight approximately: 4,500 lbs.-	86-68430	4	EA		DELETED
	49	Station Service Switchgear, 600 volt (5 sections) (400 lbs each), 3 ft x 3ft x 90 inches high. Total weight approximately: 2,000 lbs.-	86-68430	4	EA		DELETED
		SUBTOTAL THIS SHEET					\$400,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i>
DATE PREPARED November 17, 2010	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

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		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	50	Unit and plant control switchboard 5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 1,000 lbs.	86-68430	1	EA		DELETED
	51	Battery system - assume 40 batteries, charger, racks and supports. Total weight approximately: 2,500 lbs.	86-68430	1	EA	\$8,000.00	\$8,000.00
	52	Raceways, Conduit and Cable (approx. 3000 lin. Ft. power & control cable, 1000 lin. Ft. conduit, 200 lin. Ft. cabletray) Total weight approximately: 8,000 lbs.	86-68430	1	EA		DELETED
	53	Misc. power & control boards 10 boards (50 lbs each) 3ft x 2 ft x 9 in Total weight approximately: 500 lbs.	86-68430	1	EA		DELETED
		Remove and dispose of the following Gantry Crane equipment at the Powerplant:					
	54	5 Gantry Crane motors - hoist (50Hp*), aux hoist (30Hp*), aux hoist trolley (5Hp*), gantry (2-15Hp*) (Hp* Approx.) Total weight approximately: 750 lbs.	86-68430	1	EA	\$2,000.00	\$2,000.00
	55	Gantry Crane control equipment (3 cubicles) Total weight approximately: 900 lbs.	86-68430	1	EA	\$6,000.00	\$6,000.00
SUBTOTAL THIS SHEET							\$16,000.00

QUANTITIES		PRICES	
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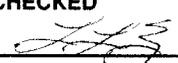
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		ELECTRICAL					
		Remove and dispose of the following Gantry Crane equipment at the Powerplant:					
	56	Conduit and Cable (approx. 3000 lin. Ft. power & control cable, 100 lin. Ft. power cable from reel, 1000 lin. Ft conduit) Total weight approximately: 8,000 lbs.	86-68430	1	EA	\$10,000.00	\$10,000.00
	57	Exterior Lighting 6 poles with lights (250 lbs. each) Total weight approximately: 1,500 lbs.	86-68430	1	EA	\$2,000.00	\$2,000.00
		Remove and dispose of the following Transmission Lines:					
	58	Transmission Line No. 59 From Boyle Substation to Line Tie 266.8 ACSR, 69-kV	86-68430	1.66	mile	\$25,000.00	\$41,500.00
	59	Transmission Line No. 98 From Boyle Substation to Line Tie on Line 18 #2 AAC, 69-kV	86-68430	0.24	mile	\$25,000.00	\$6,000.00
	60	Transmission Line No. 58 From Boyle Substation to Line Tie 266.8 ACSR, 69-kV Major substation equipment (transformers, circuit breakers, etc.) to be salvaged by PacifiCorp	86-68430	1.66	mile	\$25,000.00	\$41,500.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$908,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED 
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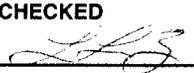
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		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete 3000 psi, reinforced concrete. Waste in scour hole	86-68130	1,600	yd3		DELETED
	62	Remove Fish Screen Building Building is located on top of intake structure. Wood frame construction, with metal rib roof and metal siding. Some wood is pressure treated, which may be considered a hazardous material.	86-68130	1,300	#2		DELETED
	63	Remove 24-inch-dia. Steel Fish Discharge Pipe Pipe is located alongside the 14-ft-dia. steel pipe. Length is estimated to be approx. 340 feet long from Sta. 0+15.25 to the outlet at the Klamath River. Assume contains paint with heavy metals.	86-68130	22,000	lbs	\$0.65	\$14,300.00
	64	Remove Concrete Items associated with the 14 ft diameter Steel Pipe. Includes anchors for horiz. pipe bende, piers, 14 ft dia. concrete conduit section, outlet transition with newer (2002) headgate vault section, siphon spillway structure, and 22 ft long spillway flume. Waste in scour hole	86-68130	1,100	yd3		DELETED
	65	Remove Open Concrete Flume Walls. 3000 psi, reinforced concrete. Total flume length = 10,761 feet. Includes both 2-wall and 1-wall flume reaches. Includes 2,300 CY of unreinforced porous concrete (gunite or shotcrete) on 1-wall flume reaches. Waste in scour hole	86-68130	12,200	yd3	\$260.00	\$3,172,000.00
		SUBTOTAL THIS SHEET					\$3,186,300.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED 11/17/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCO 4/22/11

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	REGION: MP	UNIT PRICE LEVEL: July-2010	
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	66	Remove Structural Steel Items associated with the Forebay Trashrack Piers. Includes three 16 WF beams, each about 61.3 feet long, that support the trashracks. Assume contains paint with heavy metals.	86-68130	11,500	lbs	\$0.65	\$7,475.00
	67	Remove Forebay Concrete Walls 3000 psi, reinforced concrete. Includes forebay, forebay spillway, forebay sluiceway, and forebay drainage items (man-hole, 12-inch concrete drain pipe). Waste in scour hole	86-68130	1,500	yd3	\$260.00	\$390,000.00
	68	Place Concrete Plugs at Tunnel Portals 3000 psi, reinforced concrete min., two plugs @ 2-ft thick. Upper portal is a concrete-lined horseshoe shape, 16.5 ft high by 15.5 ft wide. Lower portal is a grouted, steel-lined conduit 16 feet in diameter.	86-68130	30	yd3	\$1,000.00	\$30,000.00
	69	Remove Concrete Items associated with Penstocks D/S from Tunnel. Includes surge tank support and anchor block #1, anchor block #2, two anchor blocks at P.I. #3, and all ring girder supports. Waste in scour hole	86-68130	1,800	yd3	\$260.00	\$468,000.00
	70	Headgate Control Bldg. at Flume Entrance. Concrete block on concrete slab.	86-68130	330	ft2	\$40.00	\$13,200.00
	71	Forebay Spillway Gate House Metal building on wood frame covering forebay spillway radial gates.	86-68130	570	ft2	\$40.00	\$22,800.00
	72	Forebay Control Building. Wood building on metal frame.	86-68130	470	ft2	\$40.00	\$18,800.00
SUBTOTAL THIS SHEET							\$950,275.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED 11/17/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCB 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Penstock	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF121 ESTIMATE LEVEL: Feasibility
	REGION: MP UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	73	Communication Tower next to Forebay Control Building. Tower made of steel angles on top of concrete footings. Assume contains paint with heavy metals.	86-68130	7,100	lbs	\$0.65	\$4,615.00
	74	Insulated Generator Building next to Forebay Control Building. Metal building on top of concrete footings.	86-68130	72	ft2	\$40.00	\$2,880.00
SUBTOTAL THIS SHEET							\$7,495.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED 11/17/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DOD 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Penstock	PROJECT: Klamath River Northern California/Southern Oregon				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">WOID: AF121</td> <td style="width:33%;">ESTIMATE LEVEL: Feasibility</td> </tr> <tr> <td>REGION: MP</td> <td>UNIT PRICE LEVEL: July-2010</td> </tr> </table>		WOID: AF121	ESTIMATE LEVEL: Feasibility	REGION: MP	UNIT PRICE LEVEL: July-2010
WOID: AF121	ESTIMATE LEVEL: Feasibility				
REGION: MP	UNIT PRICE LEVEL: July-2010				
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\JC Boyle\Klamath Dams Removal - JC Boyle - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Ssummary					

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at the Fish By-Pass Intake:					
	76	Fixed Wheel Gate Gate, frame and hoist (steel) (Assume contains paint with heavy metals & petroleum products)	86-68420	55,000	lbs		DELETED
	76	Trash rack and trash rake (steel)	86-68420	75,000	lbs		DELETED
	77	Stop Logs and slots (steel) stop log slots embedded in concrete (Assume contains paint with heavy metals)	86-68420	136,000	lbs		DELETED
	78	Traveling Water Screen 4 traveling water screens 4 spraywater pumps (Assume contains petroleum products)	86-68420	124,000	lbs		DELETED
	79	Fish By Pass and Supports (steel), 4-Pronged Inlet to Forebay, Spillway, Deer Escape Flume (Assume contains paint with heavy metals)	86-68420	610,000	lbs		DELETED
SUBTOTAL THIS SHEET							

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED December 9, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

FEATURE:		PROJECT:	
Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Penstock		Klamath River Northern California/Southern Oregon	
		WOID: AF121	ESTIMATE LEVEL: Feasibility
		REGION: MP	UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at the Forebay, Spillway, Deer Escape Flume:					
	80	Radial Gates and Hoists 2 radial gates, 2 hoists (Assume contains paint with heavy metals & petroleum products)	86-68420	16,500	lbs	\$0.65	\$10,725.00
	81	Trash rack and trash rake (steel)	86-68420	43,500	lbs	\$0.50	\$21,750.00
	82	Stop Logs and slots (steel) stop log slots embedded in concrete (Assume contains paint with heavy metals)	86-68420	14,500	lbs	\$0.65	\$9,425.00
		Remove and dispose of the following equipment at the Penstock Intake:					
	83	Penstocks and bifurcation (steel) Some portions embedded in natural rock, includes pipe, expansion joints, and support rings (Assume contains paint with heavy metals)	86-68420	1,600,000	lbs	\$0.65	\$1,040,000.00
	84	Surge Tank (steel) (Assume contains paint with heavy metals)	86-68420	79,000	lbs	\$0.65	\$51,350.00
	85	2 - 108" Butterfly valves (Assume contains paint with heavy metals & petroleum products)	86-68420	148,000	lbs		DELETED
SUBTOTAL THIS SHEET							\$1,133,250.00

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED
DATE PREPARED December 9, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE NCD 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Penstock	PROJECT: Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at the Head Gate Structure:					
	86	Gate, Stem and Frame (Assume contains paint with heavy metals & petroleum products)	86-68420	28,000	lbs	\$0.65	\$18,200.00
	87	Steel Transition Manifolds on Upstream and Downstream	86-68420	250,000	lbs	\$0.50	\$125,000.00
	87A	Remove Petroleum Products from Mechanical Equipment. Includes quantities for the following equipment: From Item 85, Units 1 & 2, butterfly valves and HPUs. Hydraulic oil, 191 gal. per valve, 382 gal. total. The remaining items contain petroleum products in amounts too small to be considered for this level of estimate.	86-68420	380	gal	\$10.00	\$3,800.00
		PENSTOCK SUBTOTAL					\$5,424,320.00

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED December 9, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE Dcd 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Reservoir Vegetative Restoration	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\JC Boyle\Klamath Dams Removal - JC Boyle - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	89	SPRING GROUND SEEDING	86-68220	247	Acres	\$3,500.00	\$864,500.00
		Idaho fescue (Festuca idahoensis)	988	lbs	PLS		
		Blue wildrye (Elymus glaucus)	988	lbs	PLS		
		Small fescue (Vulpia microstachys)	988	lbs	PLS		
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1482	lbs	PLS		
		Sandberg bluegrass (Poa secunda)	124	lbs	PLS		
		Spike bentgrass (Agrostis exarata)	62	lbs	PLS		
		Wood mulch	494000	lbs			
		Tackifier	29640	lbs			
	90	SPRING BARGE SEEDING:	86-68220		Acres		DELETED
SUBTOTAL THIS SHEET							\$864,500.00

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P 2/28/2011	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i>
DATE PREPARED 02/03/11	PEER REVIEW / DATE	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: REVISION #1 Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Reservoir Vegetative Restoration	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility REGION: MP UNIT PRICE LEVEL: July-2010 FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\JC Boyle\Klamath Dams Removal - JC Boyle - Partial Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Res Reveg
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	91	SPRING AERIAL SEEDING:	86-68220	0	Acres	\$7,500.00	
	92	FALL GROUND SEEDING:	86-68220	124	Acres	\$3,500.00	\$434,000.00
		Idaho fescue (Festuca idahoensis)	494	lbs	PLS		
		Blue wildrye (Elymus glaucus)	494	lbs	PLS		
		Small fescue (Vulpia microstachys)	494	lbs	PLS		
		Bluebunch wheatgrass (Pseudoroegneria spicata)	741	lbs	PLS		
		Sandberg bluegrass (Poa secunda)	62	lbs	PLS		
		Spike bentgrass (Agrostis exarata)	31	lbs	PLS		
		Wood mulch	38000	lbs			
		Tackifier	2280	lbs			
SUBTOTAL THIS SHEET							\$434,000.00

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P 2/28/2011	BY Craig A. Grush P.E.	CHECKED [Signature] 05-25-11
DATE PREPARED 02/03/11	PEER REVIEW / DATE	DATE PREPARED 05/25/11	PEER REVIEW / DATE [Signature] 5-25-11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Boyle Dam & Powerplant Removal Most Probable Reservoir Vegetative Restoration	PROJECT: Klamath River Northern California/Southern Oregon		
	WOID: AF121	ESTIMATE LEVEL: Feasibility	
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		WATER AND ENVIRONMENTAL						
	93	RIPARIAN POLE PLANTING:	86-68220	54	Acres	\$8,500.00	\$459,000.00	
		Narrowleaf willow (<i>Salix exigua</i>)	26460	cutting				
		Arroyo willow (<i>Salix lasiolepis</i>)	3780	cutting				
		Shining willow (<i>Salix lucida</i>)	3780	cutting				
		Western serviceberry (<i>Amelanchier alnifolia</i>)	1890	cutting				
		Chokecherry (<i>Prunus virginiana</i>)	1890	transplant				
		Herbivore screen	37800	each				
		Chemical herbivore deterrent	756	gal				
		Polymer	119	lbs				
	94	WEED MANAGEMENT:	86-68220	124	Acres	\$1,500.00	\$186,000.00	
		Herbicide, post-emergent	247	lbs AI				
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION						
	95	FALL GROUND SEEDING:	86-68220	99	Acres	\$3,500.00	\$346,500.00	
		Idaho fescue (<i>Festuca idahoensis</i>)	395	lbs PLS				
		Blue wildrye (<i>Elymus glaucus</i>)	395	lbs PLS				
		Small fescue (<i>Vulpia microstachys</i>)	395	lbs PLS				
		Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	593	lbs PLS				
		Sandberg bluegrass (<i>Poa secunda</i>)	49	lbs PLS				
		Spike bentgrass (<i>Agrostis exarata</i>)	25	lbs PLS				
		Wood mulch	197600	lbs				
		Tackifier	11856	lbs				
	96	WEED MANAGEMENT:	86-68220	99	Acres	\$1,500.00	\$148,500.00	
		Herbicide, post-emergent	9	lbs AI				
		RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						\$2,738,500.00

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 
DATE PREPARED 04/12/11	PEER REVIEW / DATE Greimann, Blair P 4/12/2011	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option JC Bolye Dam & Powerplant Removal Most Probable SUMMARY	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF121 ESTIMATE LEVEL: Feasibility
	REGION: MP UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		555,400	CY	\$0.00	\$0.00
		Diversion and Care					\$11,900.00
		Dam Removal					\$2,534,085.00
		Powerhouse/Switchyard/Transmission Line Removal					\$908,000.00
		Penstock Removal					\$5,424,320.00
		Reservoir Vegetative Restoration					\$2,738,500.00
		Road Improvements					\$1,946,500.00
		Recreational Facilities to be Removed					\$89,480.00
		Subtotal					\$13,652,785.00
		Mobilization	5%	+/-			\$680,000.00
		Subtotal 1 with Mobilization					\$14,332,785.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 3%/yr compounding over 10 years)					\$4,929,280.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$19,262,065.00
		Design Contingencies	10%	+/-			\$1,737,935.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$21,000,000.00
		Construction Contingencies	20%	+/-			\$4,000,000.00
		FIELD COST					\$25,000,000.00
		Non-Contract Costs: (Environmental & Cultural Resources Mitigation ~ 45%, Design Data Collection ~ 1%, Engineering Design ~ 4%, Permitting ~ 3%, Procurement ~ 1%, Construction Management ~ 10%, and Closeout ~ 1%)	65%	+/-			\$16,000,000.00
		CONSTRUCTION COST					\$41,000,000.00
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	CHECKED Refer to Previous Sheets	BY Craig A. Grush, P.E.	CHECKED
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 04/22/11	PEER REVIEW / DATE 4/22/11