

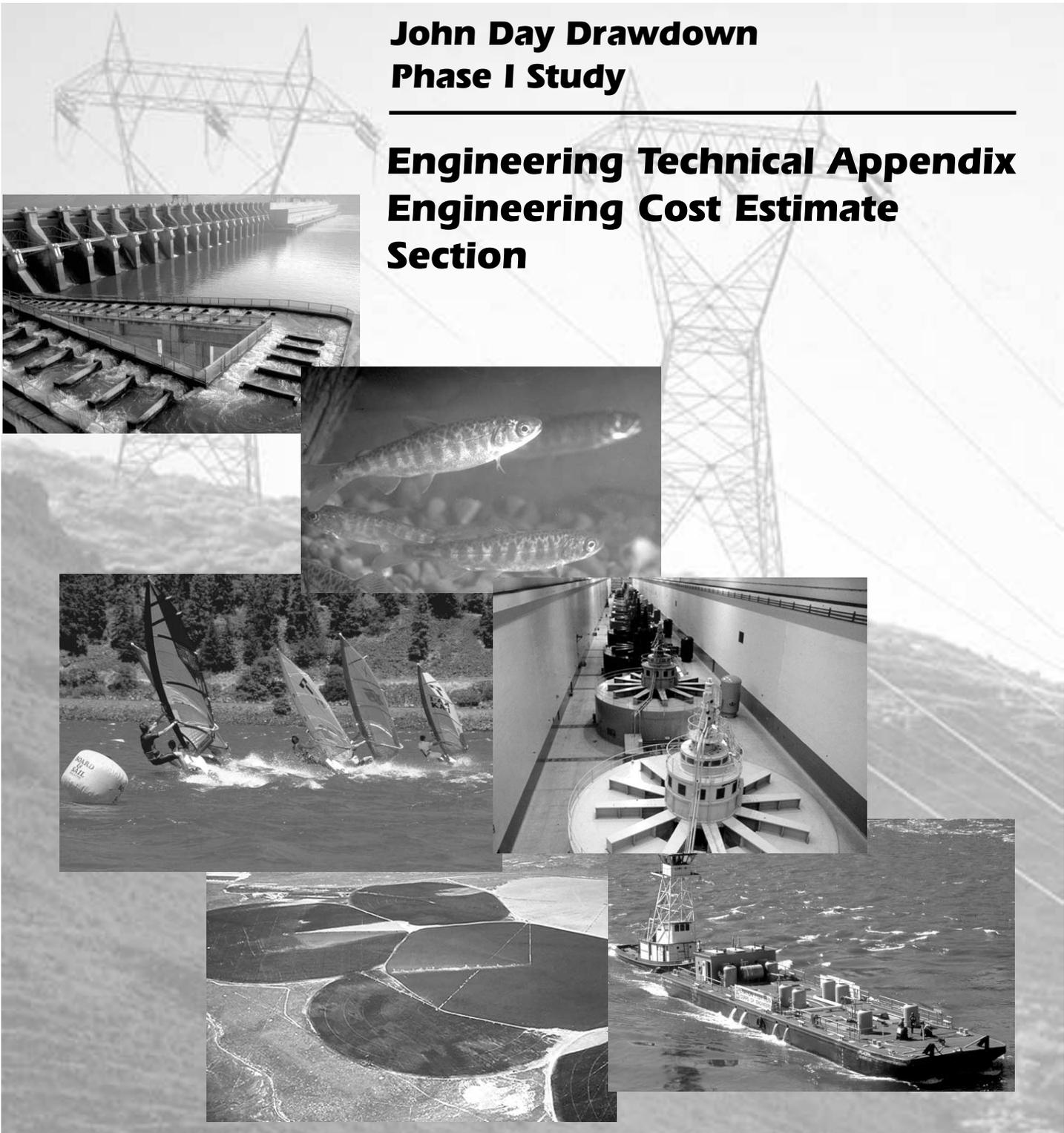


US Army Corps
of Engineers®
Portland District

Salmon Recovery through John Day Reservoir

John Day Drawdown Phase I Study

Engineering Technical Appendix Engineering Cost Estimate Section



September 2000

Table of Contents

SECTION 1. INTRODUCTION.....	1
SECTION 2. BACKGROUND OF THE PROJECT	1
SECTION 3. DESCRIPTION OF THE STUDY AREA	1
SECTION 4. ALTERNATIVES	3
4.1 Spillway Drawdown without Flood Control (Alternative 1).....	3
4.2 Spillway Drawdown with Flood Control (Alternative 2).....	4
4.3 Natural River Drawdown without Flood Control (Alternative 3).....	4
4.4 Natural River Drawdown with Flood Control (Alternative 4).....	4
SECTION 5. BASIS OF THE COST ESTIMATE	4
5.1 Basis of Design.....	4
5.2 Estimate References	5
SECTION 6. CONSTRUCTION SCHEDULE	5
6.1 Construction Windows.....	5
6.2 Acquisition Plan	5
6.3 Subcontracting Plan.....	6
SECTION 7. QUANTITIES INFORMATION.....	6
7.1 Quantities	6
7.2 Computation of Quantities	6
7.3 Estimating Using Quantities.....	6
SECTION 8. ESTIMATE DEVELOPMENT	7
8.1 General	7
8.2 Construction Methods	7
8.3 Site Access	7
8.4 Borrow Areas	7
8.5 Construction Cost.....	7
8.6 Construction Equipment.....	8
8.7 Structural Estimates.....	8

8.8	Reservoir Embankment/Slope Protection	9
8.9	Reservoir Drainage Structure Modifications.....	9
8.10	Road and Railroad Repair Plan.....	9
8.11	Navigation Channel.....	9
8.12	Irrigation Modifications	10
8.13	Equipment/Labor Availability.....	10
8.14	Environmental Concerns.....	10
8.15	Contingencies by Feature or Sub-Feature	10
8.15.1	Construction Contingency.....	11
8.15.2	Contingencies for Functional Accounts.....	11
8.15.3	Effective Dates for Labor, Equipment, Material Pricing	11
SECTION 9. MOBILIZATION, DEMOBILIZATION AND PREPARATORY WORK..		11
SECTION 10. OVERHEAD, PROFIT AND BOND		11
SECTION 11. FUNCTIONAL COSTS.....		11
11.1	01 Account - Lands and Damages.....	12
11.2	30 Account - Planning, Engineering and Design	12
11.2.1	Planning.....	12
11.2.2	Plans and Specifications.....	12
11.2.3	Engineering During Construction:	12
11.3	31 Account - Construction Management.....	12
SECTION 12. ESCALATION		13
SECTION 13. ATTACHMENTS.....		14
Attachment A: Total Project Cost Summary, Alternatives 1 & 2 - Towboater's Design		
Attachment B: Total Project Cost Summary, Alternatives 3 & 4 - Towboater's Design		
Attachment C: Total Project Cost Summary, Alternative 1 & 2 Pump		
Attachment D: Total Project Cost Summary, Alternative 3 & 4 Pump		
Attachment E: Total Project Cost Summary, Alternative 1 - 4 Canal		

Figures

Figure 1 John Day Drawdown Phase I Study Area	2
---	---

SECTION 1. Introduction

This technical appendix section documents the results of the engineering cost evaluation for the John Day Drawdown Phase I Study. This Phase I Study is a reconnaissance-level evaluation of the potential consequences and benefits of the proposed drawdown of the John Day Reservoir. This technical appendix section supplements the main report, which describes more fully the alternatives, purpose, scope, objectives, assumptions, and constraints of the study.

SECTION 2. Background of the Project

In 1991, the National Marine Fisheries Service (NMFS) proposed that Snake River wild sockeye, spring/summer chinook, and fall chinook salmon be granted “endangered” or “threatened” status under provisions of the Endangered Species Act. Natural resource agencies believe that the drawdown of the 76-mile John Day Reservoir may provide substantial improvements in migration and rearing conditions for juveniles by increasing river velocity, reducing water temperature and dissolved gas, and restoring riverine habitat. It is also speculated that drawdown may improve spawning conditions for adult fall chinook by restoring spawning habitat and the natural flow regimes needed for successful incubation and emergence.

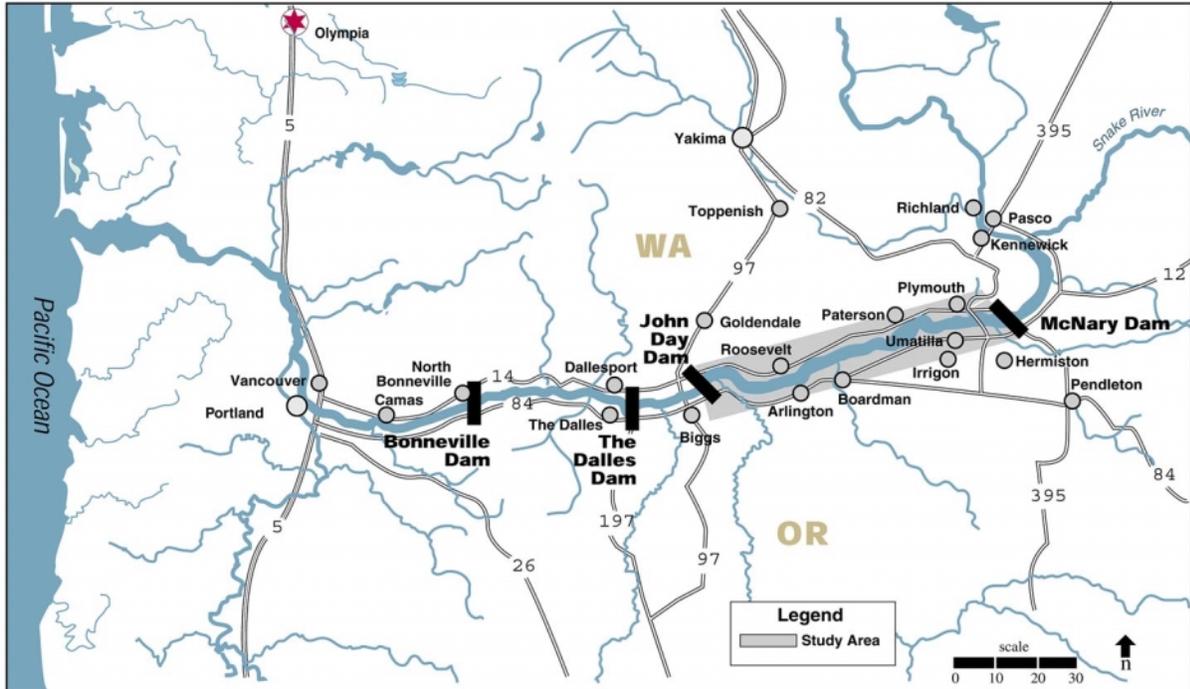
As a result, the NMFS Reasonable and Prudent Alternative Action #5 of its’ Biological Opinion on Operation of the Federal Columbia River Power System (FCRPS), and subsequent reports recommended that USACE investigate the feasibility of lowering John Day Reservoir. In compliance with appropriation conditions, only two alternatives were to be evaluated: reduction of the current water surface elevation 265¹ to the level of the spillway crest that would vary between elevations 217 and 230, or reduction to natural river level elevation 165. Both alternatives were proposed by NMFS. These two alternatives were then expanded to consider each alternative with 500,000 acre-feet of flood storage and without such storage. Flood storage and hydropower are the current approved authorizations for the John Day project.

SECTION 3. Description of the Study Area

The Columbia River originates in Canada and flows for 300 miles through eastern Washington to Oregon and continues west to the Pacific Ocean, as shown in [Figure 1](#). The adjoining region is mostly open country, with widely scattered population centers. The climate of the region is semiarid. Agriculture, open space, and large farms are prevalent. Lands adjacent to the reservoir are used to grow grains and other crops. The reach of the Columbia River under consideration in this report extends from John Day Lock and Dam at river mile (RM) 215.6, to McNary Lock and Dam RM 291. The body of water impounded by John Day Dam, Lake Umatilla, is referred to as the John Day Reservoir throughout this report. The John Day is the second longest reservoir on the Columbia River, extending 76 miles upstream to McNary Dam.

¹ All elevations referred to in this Phase I Study are referenced in feet to the National Geodetic Vertical Datum.

Figure 1: John Day Drawdown Phase I Study Area



John Day Dam and Reservoir are part of the Columbia-Snake Inland Waterway. This shallow-draft navigation channel extends 465 miles from the Pacific Ocean at the mouth of the Columbia River to Lewiston, Idaho. The entire channel consists of three segments. The first is the 40-foot-deep water channel for ocean-going vessels that extends for 106 miles from the ocean to Vancouver, Washington. The second is a shallow-draft barge channel that extends from Vancouver to The Dalles, Oregon. Although this section is authorized for dredging to a depth of 27 feet, it is currently maintained at 17 feet. The third section of the channel is authorized and maintained at a depth of 14 feet and extends from The Dalles to Lewiston. In addition to the main navigation channel, channels are dredged to numerous ports and harbors along the river.

The middle Columbia River area is served by a well-developed regional transportation system consisting of highways, railroads, and navigation channels. Railroads and highways parallel the northern and southern shores of the reservoir. Interstate 84 (I-84), a divided multilane highway, runs parallel on the south shore with the Columbia River from Portland, Oregon, to points east. Washington State Route 14 (SR-14) also parallels the Columbia River from Vancouver to McNary Dam on the north shore. Umatilla Bridge at RM 290.5, downstream from McNary Dam, is the only highway bridge linking Oregon and Washington across the Columbia River in the John Day Reservoir.

The study area includes lands directly adjacent to the reservoir as well as those directly and indirectly influenced by the hydrology of the reservoir (e.g., irrigated lands). It includes the reservoir behind the John Day Dam, and adjoining backwaters, embayments, pools, and rivers.

SECTION 4. Alternatives

The Phase 1 Study includes a preliminary evaluation of the impacts of the drawdown scenarios relative to the “without project condition,” which is defined as the condition that would prevail into the future in the absence of any new federal action at John Day. The four alternatives are summarized below. One of the most important constraints on the alternatives is the requirement to pass fish for river flows up to the 10-year flood flow of 515,000 cfs. Under the four alternatives, John Day Reservoir would be drawn down at a rate of one foot per day. For greater detail, please refer to the main report, *John Day Drawdown Phase 1 Study*, and *John Day Drawdown Phase 1 Study, Engineering Technical Appendix, Structural Alternatives Section*.

4.1 Spillway Drawdown without Flood Control (Alternative 1)

The first drawdown alternative is based on requirements for improved downstream fish passage conditions during both low and flood flow conditions on the Columbia River. The existing 20-bay spillway will be operated differently from current operations, but without any structural modifications. All project inflows will be directly passed through the dam spillway with the spillway gates fully opened in free overflow condition, resulting in a pool elevation that will vary from elevation 217 to 230. Impacts downstream from John Day Dam were not studied.

4.2 Spillway Drawdown with Flood Control (Alternative 2)

The second study alternative is based on requirements for improved downstream fish passage conditions during low flow periods, while maintaining authorized flood control for the John Day Project. The existing 20-bay spillway will be operated differently from current operations, but without any structural modifications. During low flow periods, project inflows will be directly passed through the dam spillway with the spillway gates set in fully open, free overflow condition. During a flood event, however, the spillway gates will be controlled to reduce downstream flood flows based on using 500,000 acre-feet of allocated project storage space. Ponding will occur upstream from the dam. Impacts downstream from John Day Dam were not studied.

4.3 Natural River Drawdown without Flood Control (Alternative 3)

The third study alternative is based on a natural river drawdown for fish passage “without flood control” condition. Natural river conditions pertain to an opening at the John Day Dam that permits acceptable upstream fish passage conditions. The size of the total dam opening must conform to two criteria based on an invert elevation at the dam of 135. The first criterion is that the opening must be sufficiently large to meet maximum allowable stream velocity criteria for sustained swim speed for the weakest salmon species, which is estimated to be 10 feet per second (fps). The second criterion is that fish passage for this opening must correspond to the 10-year annual flood peak (515,000 cfs). This alternative will require extensive modifications to John Day Dam even beyond modification of the 1,228-foot long spillway structure. Impacts downstream from John Day Dam were not studied.

4.4 Natural River Drawdown with Flood Control (Alternative 4)

This fourth study alternative is based on natural river conditions for fish passage and includes the “with flood control” condition. It requires natural fish passage conditions for both upstream and downstream directions at the dam and includes a requirement for full authorized flood control. The calculated width of the total dam opening will correspond to that previously calculated for natural river conditions without flood control (Alternative 3). Impacts downstream from John Day Dam were not studied.

SECTION 5. Basis of the Cost Estimate

Estimates have been prepared for the four alternatives discussed above. In addition, eight navigation alternative estimates have been prepared along with estimates to compare two irrigation alternatives.

5.1 Basis of Design

The basis for the estimates is the Draft John Day Drawdown Phase I Study Report, October 1999.

5.2 Estimate References

The following references were used in the development of cost estimates for project implementation of the four alternatives discussed in Section 4.

ER 1110-2-1300	Cost Engineering Policy and General Requirements, March 1993
ER 1110-2-1302	Civil Works Cost Engineering, 31 March 1994
ER 1110-3-1301	Civil Engineering Policy and General Requirements for Hazardous, Toxic, and Radioactive Wastes Remedial Action Cost Estimate, 10 March 1999
ER 1130-2-307	Operations, Dredging Policies and Practices, June 1992
EM 1110-2-1304	Civil Works Construction Cost Index System, September 1998
EP 1110-1-8	Construction Equipment Ownership and Operating Expense Schedule, Volume 8, September 1999
EI 01D010	Construction Cost Estimates, 1 September 1997

SECTION 6. Construction Schedule

The proposed construction schedule for each alternative is presented in the Phase I Report. The time required to modify the dam structure and navigation channel is estimated to take 4.5 to 10.5 years, depending on the alternative identified for implementation. Alternatives 1, 2, and 3 are estimated to take approximately 5 years for project construction, and Alternative 4 will require approximately 10 years. Additional years will probably be required to complete other features of the project.

6.1 Construction Windows

The concerns of fishery agencies regarding fish entrapment and interference with salmon migration have resulted in designated in-water work periods in the Columbia River. The in-water work period in the Columbia River extends from November to February. Although the “windows” for dredging operations in the navigation channel are year-round. However, the estimated dredging window for this project is 200 days per year because work suspension is required during the presence of salmonids.

6.2 Acquisition Plan

As stated above, construction would require 4.5 to 10.5 years depending on the alternative selected for implementation. At present, there is no need to acquire land for construction features of the project. Upland disposal site improvements would be accomplished during the dredging. The disposal sites would be located on USACE land. The unit costs used for the dredging costs include development of the disposal site and disposal of the material at the site.

6.3 Subcontracting Plan

It is assumed that several prime contractors will be bidding for this work. This estimate is based on there being four prime contractors, as follows: (1) a prime for the navigation work, (2) a prime for the relocations, (3) a prime with no markups where the estimate is based on historical data (where the markups are included), and (4) an overall prime for the structural. It is anticipated that the structural prime on this project will require subcontractors for the diving, demolition, mechanical, electrical, mining, cofferdam, and dredging portions of the project.

SECTION 7. Quantities Information

7.1 Quantities

The quantities for the major features of the proposed project were computed by other consulting engineering firms, including CH2M Hill / Montgomery Watson (joint venture) for the structural and West Consultants, Inc., for the navigation, port facilities, and other features (e.g., highways, railroads, culverts, bridges and dredging of tributaries). USACE's Portland District staff developed the quantities for cultural management and mitigation, erosion and wildlife, irrigation, municipal and industrial water supply, road and railroad impacts, recreation, relocation of treaty fishing access sites, and utilities.

7.2 Computation of Quantities

The quantities were computed using existing documents (reports, studies and maps). One of the criteria for this study was to use existing information to develop the report.

7.3 Estimating Using Quantities

The quantities generated were provided to Walla Walla District staff to use in preparation of the estimate. Lump sum prices by feature were given to the estimator and generally were based on historical data. These lump sum amounts were included in the estimates.

SECTION 8. Estimate Development

8.1 General

The Walla Walla District Cost Engineering Branch of USACE developed the construction costs based on quantities, scope of work, assumptions, and methodology provided by the Portland District and presented elsewhere in this report. The following subsections summarize specific details concerning the basis of costs for each of the construction features. The comprehensive, detailed, cost estimates were developed using the Micro Computer Aided Cost Engineering System (MCACES) and are on file with the Portland District Cost Engineering Branch of USACE.

8.2 Construction Methods

The types and methods of construction are based primarily on existing information from other projects, including the Columbia River fish program and the Lower Snake River Juvenile Salmon Migration Feasibility Study. The construction at the dam involves modifications to the north shore and south shore fish ladders, juvenile bypass system, powerhouse turbines, auxiliary water system, powerhouse water systems, navigation lock, and spillway. The construction methods for riprap placement on USACE projects will be used for slope protection. All work uses standard construction methods that have been applied at other projects. No unique techniques of construction are anticipated.

8.3 Site Access

Existing access to the dam site will need to be modified in order to complete this project. Additional access for other features of the project are to be provided as needed during construction, in particular the upland disposal sites and placement of slope protection.

8.4 Borrow Sites

Two sites are required to obtain shot rock and riprap. It is assumed that a quarry at Arlington, Oregon, can provide the materials necessary for work on the upstream side of the dam. Correspondingly, it is assumed that materials on the downstream side of the dam will come from quarries west of The Dalles. There are several gravel pits located within three miles of John Day Dam, and it is assumed that sand and gravel can be obtained from these locations. These assumptions were made until further site-specific investigations and other fieldwork are performed.

8.5 Construction Costs

Components of construction costs include the following five cost elements: labor, permanent materials, construction equipment, subcontracts, and contractor's expendable supplies. The key ingredient in determining the cost of each of these elements is productivity of the work force and the construction equipment used to perform the various work activities. Productivity rates for the embankment excavation work were selected to reflect local weather, site conditions, work week hours, craft experience and availability, appropriate construction techniques, schedule sequencing, and experience gained on previous construction projects.

Most costs were developed using databases for the cost of components of labor, materials, and equipment. In some cases, costs from the bid tabulations of previously bid and constructed projects were selected to represent the actual cost of similar-type portions of this project. These historical values were then escalated to current dollar values and adjusted for economies of scale and other factors to provide a rapid and relatively accurate reflection of the cost to do the work. A third source of prices included commercially available construction cost data guides. Generally, costs were developed for the items where quantities and descriptions were provided in sufficient detail to generate this type of estimate.

Prevailing wage rates were obtained, and payroll taxes and insurance were applied as appropriate to wage and labor standards. The estimate used Davis Bacon labor rates for Sherman County, Oregon, OR990017, Modification No 2. Materials prices were obtained from appropriate local supply sources or were estimated, based on the cost of erection and operation of site processing plants to handle large volumes of materials available at or near the site. Construction equipment rates for materials excavation, transportation, and placement were established to include the cost of ownership, fuel consumption, maintenance and repair, and other operations costs (except the labor for equipment operation). The source for these equipment rates is *Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8*, Volume 8, September 1997.

8.6 Construction Equipment

Generally, a hydraulic excavator is used for excavation. For work below the waterline, a dragline is used for rock placement/excavation. Because of the large volume of material being handled, it was assumed that an excavator with a minimum 13-cubic yard bucket would be required. Additional support equipment selected for placement and compaction of soil and rock materials included more conventional smaller-sized dozers, graders, track and rubber-tired backhoes, and water trucks. Performance rates for these equipment spreads were selected from manufacturers' handbooks and adjusted based on experience and site conditions. Costs were developed from *Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8*, Volume 8, September 1997.

Additional costs were developed for drilling, blasting, and processing costs, including sorting and crushing of blasted rock. A barge and tug are part of the floating plant used for underwater drilling, blasting, and excavation.

It has been assumed that required materials will be transported by barge and floating plant, and this cost has been included in the estimate. In addition, the sheetpile will also be driven from floating plant.

8.7 Structural Estimates

The structural portion of the estimate is based on the assumptions, schedule, methodology, and scope of work contained in the CH2M Hill/ Montgomery Watson Joint Venture report entitled *John Day Drawdown Phase I Study, Structural Alternatives Appendix* dated July 1999. The estimates use quantities generated from that report.

8.8 Reservoir Embankment/Slope Protection

The construction cost of embankment protection for the John Day Reservoir was estimated based on quantity takeoffs developed by the Portland District. Quantities were calculated separately for each embankment segment on the reservoir. The cost for production of riprap was based on crews required for drilling and blasting, assumed overburden depth, drill pattern, powder factor, yield of material, secondary blasting, handling of material, sorting, and crushing. It was assumed that the quantity and grade of material required would be available from a quarry located in Arlington

The other component of the proposed riprap protection was the cost of barge transportation and stockpiling prior to drawdown, with hauling from the stockpiles and placement/final dressing of the slopes after reservoir drawdown occurs. The estimate assumes that stockpiles would be placed approximately every 10 miles on both sides of the river along the length of the reservoir.

8.9 Reservoir Drainage Structure Modifications

Quantity takeoffs for these modifications were based on dimensions, site-specific elevations, and slope distances for all identified drains. Quantities were calculated separately for each drain location and combined into an estimate of the cost to construct all drain modifications.

The cost was estimated based on the size of the culvert and the recommended treatment. The treatment is as follows: riprap blanket slope protection for small culverts, downspouts at medium culverts, grouted riprap at large culverts and areas where the river is connected to ponds required additional new culverts or culvert replacement.

The costs of horizontal borings were estimated based on available data for medium-diameter casings. A large portion of the total cost is involved in mobilizing and setting up the pit, aligning guiderails for the boring/jacking machine, and machine assembly. It was assumed that the work areas would be accessible by existing roads.

8.10 Road and Railroad Repair Plan

In 1992, during a test drawdown at Lower Granite Dam, road and embankment failures were observed. The 1992 drawdown was the basis for the road and railroad failures documented in the Lower Snake River Juvenile Salmon Migration Feasibility Study. That feasibility study developed a quantity for potential failures, a method for treating the failures, and an estimated cost for implementing the repairs. The lump sum cost included in the John Day Drawdown Phase 1 Study estimate was developed from the information in the Lower Snake River feasibility study

8.11 Navigation Channel

Eight navigation estimates for providing a navigation channel have been prepared. These were based on four specific designs/configurations for both the natural river drawdown option and the spillway crest option. This dredging of the navigation channel was investigated by river mile in order to develop the quantities. Quantities were then broken down into silt/clay, sand/gravel, and solid rock, which will require blasting. The excavated material will be disposed of at upland sites adjacent to the river. The cost of the dredging was

estimated by river mile in order to accurately capture costs of varying quantities, depths of cut, distances to disposal sites, and types of dredging equipment.

It was assumed that there would be four separate dredging crews working in the reservoir simultaneously and that work could occur 200 days per year in the navigation channel. Estimates were developed from historical data. Unit costs for rock blasting and dredging were developed from the Columbia River Channel Deepening Baseline Cost estimate, as were costs for construction of disposal areas and for mobilization/demobilization. Costs for the mechanical dredging of the silts, sands, clays, and gravels were developed from costs for maintenance dredging of the downstream channel at the Lower Monumental Dam.

8.12 Irrigation Modifications

Two different alternatives were investigated for providing irrigation water to the farms in Washington and Oregon along the John Day reservoir. One alternative would put a canal on each side of the river and water users would be able to pump water from the canal to their existing facilities. The other option would be to modify the existing systems by extending the pipelines to the new river location and installing booster pumps. The quantities and descriptions were provided in sufficient detail for the estimate to be developed using databases for the cost of components of labor, materials, and equipment. Assumptions used in these estimates were based on the descriptions provided with the quantities.

8.13 Equipment/Labor Availability

The necessary labor and equipment are assumed to be available in Oregon and/or Washington. It was also assumed most of the floating plant can be obtained from the Portland or Vancouver areas.

8.14 Environmental Concerns

See the environmental section in Draft Phase I Report.

No specific costs for Hazardous, Toxic and Radioactive Waste (HTRW) remediation were included in the current working estimate. If this study progresses to Phase II, the HTRW remediation will be investigated in more detail if required. HTRW remediation work is expected to be minor in nature; therefore, associated remediation costs would be relatively small. These costs are considered to be covered by contingencies for the project.

8.15 Contingencies by Feature or Sub-Feature

Contingency guidance is provided in ER 1110-2-1302. For a reconnaissance/feasibility level, contingencies of 20 percent are considered reasonable for projects over \$10 million and contingencies of 25 percent for projects less than \$10 million. These overall contingency factors are a guide for contingency development and are not intended to restrict or limit contingencies to these values.

8.15.1 Construction Contingency

The goal in contingency development is to identify the uncertainty associated with an item of work or task, forecast the risk/cost relationship, and assign a value to this task that will limit the cost risk to an acceptable degree of confidence. A contingency of 25 percent has been used for construction features to cover uncertainties in design, quantities and material costs. The range of acceptable crew composition, operating costs, production rates, equipment availability, uncertain weather conditions, barge traffic and material variations are also covered by the construction contingency.

8.15.2 Contingencies for Functional Accounts.

The contingency included in the Lands and Damages, Planning Engineering and Design, and Construction Management accounts is 25 percent to cover uncertainties in real estate, engineering, design, and construction management related to the construction features discussed above.

8.15.3 Effective Dates for Labor, Equipment, Material Pricing

The effective date for all pricing is October 1, 1998 (FY 1999).

SECTION 9. Mobilization, Demobilization and Preparatory Work.

These costs would vary for the different features of the project, depending on the construction equipment required. The mobilization-demobilization cost has been computed for each feature, and it is assumed the equipment will be available in Washington and/or Oregon.

SECTION 10. Overhead, Profit and Bond

Field office overhead costs include insurance costs, project superintendent (and/or manager), project engineer, clerical staff, project trailer, sanitary, project sign, telephone, pickups, quality control, environmental protection, and other miscellaneous items. Contractor's and subcontractors' field office overhead, home office overhead, and profit were established using historical rates for similarly sized jobs and represent the contractor's cost of doing business and assuming the risks associated with construction work. The bond rates were calculated and were based on historical rates.

SECTION 11. Functional Costs

The functional costs associated with this project were developed using a percentage, except for real estate as follows

11.1 01 Account - Lands and Damages

A cost of \$2,500 per acre was used to cover real estate costs, including administrative functions for land, which required acquisition (relocations, canals, and irrigation facilities). All other land involved with this project is owned by USACE.

11.2 30 Account - Planning, Engineering and Design

11.2.1 Planning

This item includes the development of the Phase II Feasibility Report, which is estimated to take 5 years.

11.2.2 Plans and Specifications

This item covers preparing plans and specifications, District review, technical review, contract advertisement, and award activities. It is estimated to take 3 years.

11.2.3 Engineering During Construction:

This item consists of engineering support during construction and participation in the prefinal and final inspections of the contract.

11.3 31 Account - Construction Management

This item covers construction management for the project during construction.

The percentages for functional costs were developed for the Lower Snake River Juvenile Salmon Migration Feasibility Study were reviewed by the responsible Divisions (Real Estate, Engineering, and Construction) of the Portland District and were adjusted to reflect the differences in the projects, as shown below.

Program Management (30 Account)	1.0%
Planning & Environmental Compliance (30)	1.0%
Engineering & Design (30 Account)	16.0%
Engineering Tech Review & VE (30 Account)	1.0%
Contracting & Repro (30 Account)	0.3%
Engineering During Construction (30 Account)	3.0%
Supervision & Assurance (31 Account)	6.0%
Program Management (31 Account)	0.5%
Real Estate (01 Account)	5.0%

The 30 Account (Engineering and Design) includes costs for the Phase II study, modeling studies for breaching the dam, fish passage, and navigation along with the project engineering and design.

SECTION 12. Escalation

Total project cost summary sheets were developed to show the cost to fully fund the estimate. These sheets contain the construction costs, functional costs, and contingencies that are identified at a common price level. These costs are then escalated to the mid-point of construction to account for inflation. The mid-point construction dates were developed from the construction schedules for structural modification of the dam and navigation channel modification. It was assumed that the remaining construction features would be concurrent with the dam and navigation channel modifications. The Portland District Programs staff developed escalation percentages by using the recommended OMB tables and mid-point of construction schedule.

SECTION 13. Attachments

Attachment A: Total Project Cost Summary, Alternatives 1 & 2 - Towboater's Design

Attachment B: Total Project Cost Summary, Alternatives 3 & 4 - Towboater's Design

Attachment C: Total Project Cost Summary, Alternative 1 & 2 Pump

Attachment D: Total Project Cost Summary, Alternative 3 & 4 Pump

Attachment E: Total Project Cost Summary, Alternative 1 - 4 Canal

Attachment A. Total Project Cost Summary Alternatives 1 & 2 - Towboater's Design

(US Army Corps of Engineers, Portland District, 1999)

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVE 1 Towboater's Design

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:		May-00				AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:		Oct-99				EFFECT. PRICING LEVEL: Oct 99								
ACCOUNT NUMBER	FEATURE DESCRIPTION	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	OMB (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	FEATURE MID PT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
JOHN DAY DAM AND RESERVOIR														
02 - -	RELOCATIONS	100275	25,069	25%	125,343	3.3%	103,584	25,896	129,480	Jun-2011	42.9%	148,021	37,005	185,027
03 - -	RESERVOIRS	246573	61,643	25%	308,216	3.3%	254,710	63,677	318,387	Jun-2011	42.9%	363,981	90,995	454,976
04 - -	DAMS	19707	4,927	25%	24,634	3.3%	20,358	5,089	25,447	Jun-2011	42.9%	29,091	7,273	36,364
05 - -	LOCKS	172077	43,019	25%	215,096	3.3%	177,755	44,439	222,194	Jun-2011	42.9%	254,013	63,503	317,516
06 - -	FISH AND WILDLIFE FACILITIES	166956	41,739	25%	208,695	3.3%	172,466	43,116	215,582	Jun-2011	42.9%	246,454	61,613	308,067
07 - -	POWER PLANTS	2398	600	25%	2,998	3.3%	2,477	619	3,096	Jun-2011	42.9%	3,540	885	4,425
08 - -	ROADS, RAILROADS AND BRIDGES	148130	37,032	25%	185,162	3.3%	153,018	38,254	191,272	Jun-2011	42.9%	218,663	54,666	273,328
09 - -	CHANNELS AND CANALS	21298	5,325	25%	26,623	3.3%	22,001	5,500	27,501	Jun-2011	42.9%	31,439	7,860	39,299
09 - -	CHANNELS & CANALS Navigation	310584	77,646	25%	388,230	3.3%	320,833	80,208	401,042	Jun-2011	42.9%	458,471	114,618	573,089
14 - -	RECREATION FACILITIES	16875	4,219	25%	21,094	3.3%	17,432	4,358	21,790	Jun-2011	42.9%	24,911	6,228	31,138
16 - -	BANK STABILIZATION	34514	8,629	25%	43,143	3.3%	35,653	8,913	44,567	Jun-2011	42.9%	50,949	12,737	63,686
18 - -	CULTURAL RESOURCE PRESERVATION	42676	10,669	25%	53,345	3.3%	44,084	11,021	55,106	Jun-2011	42.9%	62,997	15,749	78,746
19 - -	BUILDINGS, GROUNDS & UTILITIES	60	15	25%	75	3.3%	62	15	77	Jun-2011	42.9%	88	22	110
McNARY MODIFICATIONS														
04 - -	DAMS	10193	2,548	25%	12,741	3.3%	10,529	2,632	13,161	Jun-2011	42.9%	15,046	3,761	18,807
06 - -	FISH AND WILDLIFE FACILITIES	4818	1,205	25%	6,023	3.3%	4,977	1,244	6,221	Jun-2011	42.9%	7,112	1,778	8,890
	TOTAL CONSTRUCTION COSTS =====>	1,297,135	324,284	25%	1,621,418	3.3%	1,339,940	334,985	1,674,925		42.9%	1,914,774	478,694	2,393,468
01 - - -	LANDS AND DAMAGES	71,457	17,864	25%	89,321	3.3%	73,815	18,454	92,269	Apr-2008	29.7%	95,738	23,935	119,673
18 - -	CULTURAL RESOURCE PRESERVATION	13,063	3,266	25%	16,329	3.3%	13,494	3,374	16,868	Jun-2011	41.9%	19,148	4,787	23,935
30 - - -	PLANNING, ENGINEERING AND DESIGN	303,958	75,989	25%	379,947	4.6%	317,940	79,485	397,425	Mar-2007	34.3%	426,994	106,749	533,743
31 - - -	CONSTRUCTION MANAGEMENT	75,118	18,779	25%	93,897	4.6%	78,573	19,643	98,216	Jun-2011	58.4%	124,460	31,115	155,575
	TOTAL COST =====>	1,760,731	440,182	25%	2,200,912	3.6%	1,823,762	455,941	2,279,703		41.5%	2,581,114	645,280	3,226,394

NOTE: These costs are preliminary and are subject to change.

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVE 2 Towboater's Design

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:		May-00				AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:		Oct-99				EFFECT. PRICING LEVEL: Oct 99								
ACCOUNT NUMBER	FEATURE DESCRIPTION	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	OMB (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	FEATURE MID PT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
JOHN DAY DAM AND RESERVOIR														
02- - -	RELOCATIONS	100275	25,069	25%	125,343	3.3%	103,584	25,896	129,480	Apr-2012	47.6%	152,890	38,222	191,112
03- - -	RESERVOIRS	246573	61,643	25%	308,216	3.3%	254,710	63,677	318,387	Apr-2012	47.6%	375,952	93,988	469,940
04- - -	DAMS	19740	4,935	25%	24,675	3.3%	20,392	5,098	25,489	Apr-2012	47.6%	30,098	7,524	37,622
05- - -	LOCKS	174202	43,550	25%	217,752	3.3%	179,950	44,988	224,938	Apr-2012	47.6%	265,607	66,402	332,008
06- - -	FISH AND WILDLIFE FACILITIES	177466	44,367	25%	221,833	3.3%	183,322	45,831	229,153	Apr-2012	47.6%	270,584	67,646	338,230
07- - -	POWER PLANTS	1794	448	25%	2,242	3.3%	1,853	463	2,316	Apr-2012	47.6%	2,735	684	3,418
08- - -	ROADS, RAILROADS AND BRIDGES	148130	37,032	25%	185,162	3.3%	153,018	38,254	191,272	Apr-2012	47.6%	225,854	56,464	282,318
09- - -	CHANNELS AND CANALS	21220	5,305	25%	26,525	3.3%	21,920	5,480	27,400	Apr-2012	47.6%	32,354	8,088	40,442
09- - -	CHANNELS & CANALS Navigation	310584	77,646	25%	388,230	3.3%	320,833	80,208	401,042	Apr-2012	47.6%	473,550	118,388	591,938
14- - -	RECREATION FACILITIES	16847	4,212	25%	21,059	3.3%	17,403	4,351	21,754	Apr-2012	47.6%	25,687	6,422	32,108
16- - -	BANK STABILIZATION	34514	8,629	25%	43,143	3.3%	35,653	8,913	44,567	Apr-2012	47.6%	52,625	13,156	65,781
18- - -	CULTURAL RESOURCE PRESERVATION	42676	10,669	25%	53,345	3.3%	44,084	11,021	55,106	Apr-2012	47.6%	65,069	16,267	81,336
19- - -	BUILDINGS, GROUNDS & UTILITIES	60	15	25%	75	3.3%	62	15	77	Apr-2012	47.6%	91	23	114
McNARY MODIFICATIONS														
04- - -	DAMS	10193	2,548	25%	12,741	3.3%	10,529	2,632	13,161	Apr-2012	47.6%	15,541	3,885	19,426
06- - -	FISH AND WILDLIFE FACILITIES	4818	1,205	25%	6,023	3.3%	4,977	1,244	6,221	Apr-2012	47.6%	7,346	1,837	9,183
	TOTAL CONSTRUCTION COSTS =====>	1,309,091	327,273	25%	1,636,364	3.3%	1,352,291	338,073	1,690,364		47.6%	1,995,981	498,995	2,494,977
01- - -	LANDS AND DAMAGES	74,488	18,622	25%	93,110	3.3%	76,946	19,237	96,183	Apr-2008	29.7%	99,799	24,950	124,749
18- - -	CULTURAL RESOURCE PRESERVATION	13,617	3,405	25%	17,022	3.3%	14,066	3,517	17,583	Jun-2011	41.9%	19,960	4,990	24,950
30- - -	PLANNING, ENGINEERING AND DESIGN	316,850	79,212	25%	396,062	4.6%	331,425	82,856	414,281	Mar-2007	34.3%	445,104	111,276	556,380
31- - -	CONSTRUCTION MANAGEMENT	75,171	18,793	25%	93,964	4.6%	78,629	19,658	98,287	Apr-2012	65.0%	129,738	32,435	162,173
	TOTAL COST =====>	1,789,217	447,305	25%	2,236,522	3.6%	1,853,357	463,341	2,316,698		45.2%	2,690,582	672,646	3,363,229

NOTE: These costs are preliminary and are subject to change.

JOHN DAY NAV TOWBOATER'S DESIGN
JOHN DAY DAM DRAWDOWN
CURRENT WORKING ESTIMATE
Effective Price Level 1 OCT 99
--- FOR OFFICIAL USE ONLY ---

Designed By: NWP Engineering Division
Estimated By: Skarbek

Prepared By: NWW-C, Cost Engineering Branch
Kim Callan, P.E., Branch Chief

Preparation Date: 05/30/00
Effective Date of Pricing: 10/01/99
Est Construction Time: 1308 Days

Sales Tax: 0.00%

This report is not copyrighted, but the information
contained herein is For Official Use Only.

M C A C E S F O R W I N D O W S
Software Copyright (c) 1985-1998
by Building Systems Design, Inc.
Release 1.2c

PROJECT DESCRIPTION

This estimate consists of costs for the Navigation Dredging associated with the John Day Drawdown Phase 1 Study. This estimate examines the Towboater's Design for Alternatives 1 and 2, drawdown of the reservoir to spillway crest without and with flood control, respectively.

BASIS OF DESIGN

This is a current working estimate for the John Day Drawdown Phase 1 Study. It is based on quantities provided by the Corps of Engineers Portland District or through one of their contractors. This estimate uses unit costs developed from historical cost data.

CONSTRUCTION SCHEDULE

It is assumed dredging will occur prior to drawdown. Drawdown is scheduled to start on December 1, 2012.

CONSTRUCTION WINDOWS

It is assumed that dredging can occur for 200 days per year.

OVERTIME

This estimate does not use overtime.

ACQUISITION PLAN

It is assumed that four contracts will be acquired through the Bidding process. It is assumed that the work will not be performed by a contractor under the Small Business Administration 8a program.

SUB-CONTRACTING PLAN

This estimate does not use any subcontracting for the dredging work.

PROJECT CONSTRUCTION SITE ACCESS

The project site is located in the 73 mile long reservoir from the John Day Dam to the McNary Dam. Access is by floating plant.

BORROW AREAS

It is assumed that all material required for construction of the containment dikes will be available at the site of the containment areas.

CONSTRUCTION METHODOLOGY

The construction methodology is standard.

UNUSUAL CONDITION

There are no unusual conditions.

UNIQUE TECHNIQUES OF CONSTRUCTION

Construction is standard.

EQUIPMENT AND LABOR AVAILABILITY & DISTANCE TRAVELED

It is assumed that labor and equipment are available in the States of Oregon and Washington. With most of the floating plant coming from the Portland, OR/Vancouver WA area.

ENVIRONMENTAL CONCERNS

Allowances have been made for environmental concerns by limiting the dredging window to 200 days per year.

EQUIPMENT AND LABOR RATES

This estimate uses Davis Bacon labor rates for Sherman County, Oregon OR990017, Modification No 2 dated 4/02/99.

Equipment rates used are from EP 1110-1-8, Volume 8, September 1997.

Material prices were obtained from quotes, internet sources, pricing guides, supply catalogs and historical data (escalated to FY 1999), the MCACES National Unit Price Book UP99EB.

No sales tax has been applied.

The effective price level is 1 October 1998 (FY1999)

SUMMARY REPORTS	SUMMARY PAGE
PROJECT INDIRECT SUMMARY - FEATURE.....	1
PROJECT INDIRECT SUMMARY - BID ITEM.....	2
PROJECT INDIRECT SUMMARY - CSI ITEM.....	5
PROJECT DIRECT SUMMARY - FEATURE.....	11
PROJECT DIRECT SUMMARY - BID ITEM.....	12
PROJECT DIRECT SUMMARY - CSI ITEM.....	15

DETAILED ESTIMATE	DETAIL PAGE
JD. JOHN DAY ALTERNATIVE 1 & 2 DRAWD	
09. CHANNELS AND CANALS	
03. ALT1&2 PORTS & RECREATION	
01. PORT OF ARLINGTON	
91AA. CARGILL GRAIN ELEVATOR	
01AA. CARGILL GRAIN ELEVATOR.....	1
91BA. MARINA	
01AA. MARINA.....	1
91CA. CITY PARK	
01AA. CITY PARK.....	1
91DA. BOAT RAMP	
01AA. BOAT RAMP.....	2
02. BOARDMAN PARK & MARINA	
91AA. WELLS	
01AA. WELLS.....	2
91BA. DOCKS	
01AA. DOCKS.....	2
91CA. POOL (NEW REBUILD)	
01AA. POOL (NEW REBUILD).....	2
03. HOGUE-WARNER GRAIN ELEVATOR	
91AA. OPTION 1 REPLACE FACILITIES	
01AA. GRAIN SILO 1.....	3
01BA. GRAIN SILO 2.....	3
01CA. GRAIN SILO 3.....	3
91BA. OPTION 2 MODIFY EXISTING	
01AA. OPTION 2 MODIFY EXISTING.....	3
04. IRRIGON MARINA	
91AA. BOAT RAMP & DOCKS	
01AA. BOAT RAMP & DOCKS.....	4
05. PORT OF MORROW	
91AA. AGGREGATE LOADING BARGE SLIP	
01AA. AGGREGATE LOADING BARGE SLIP.....	4
91BA. LONGVIEW CHIP RELOAD DOCK	
01AA. LONGVIEW CHIP RELOAD DOCK.....	4
91CA. CONTAINER BARGE SLIP	
01AA. CONTAINER BARGE SLIP.....	4
91DA. FACE DOCK	
01AA. FACE DOCK.....	5
91EA. TIDEWATER CHIP RELOAD DOCK	
01AA. TIDEWATER CHIP RELOAD DOCK.....	5
91FA. MESSNER COVE GRAIN TRMNL	

DETAILED ESTIMATE	DETAIL PAGE
01AA. MESSNER COVE GRAIN TRMNL.....	5
91GA. AGGREGATE LOADING FACILITY	
01AA. AGGREGATE LOADING FACILITY.....	5
91HA. INFRASTRUCTURE	
01AA. INFRASTRUCTURE.....	6
06. PORT OF ROOSEVELT	
91AA. GRAIN SILO	
01AA. GRAIN SILO.....	6
91BA. BARGE LOADER & PILINGS	
01AA. BARGE LOADER & PILINGS.....	6
91CA. ANNEX, BINS	
01AA. ANNEX, BINS.....	6
91DA. METAL TANK	
01AA. METAL TANK.....	7
91EA. ENTIRE PORT	
01AA. ENTIRE PORT.....	7
07. UMATILLA PARK & MARINA	
91AA. BOAT RAMP & DOCKS	
01AA. BOAT RAMP & DOCKS.....	7
05. ALT1,2,3&4 MECHANICAL DREDGING	
1. MECHANICAL DREDGING	
15AA. PORT OF ARLINGTON	
02AA. MARINA DREDGING.....	7
02CA. DISPOSAL AREA CONSTRUCTION.....	8
15BA. BOARDMAN PARK AND MARINA	
02AA. MARINA DREDGING.....	8
02CA. DISPOSAL AREA CONSTRUCTION.....	8
15CA. IRRIGON MARINA	
02AA. MARINA DREDGING.....	9
02CA. DISPOSAL AREA CONSTRUCTION.....	9
15DA. PORT OF MORROW	
02AA. BARGE SLIP 1 DREDGING.....	9
02BA. CHIP RELOAD DREDGING.....	9
02CA. CONTAINER TERMINAL.....	10
02DA. GRAIN RELOAD.....	10
02EA. GRAVEL RELOAD.....	10
02FA. TURNING BASIN.....	10
02GA. DISPOSAL AREA CONSTRUCTION.....	11
15EA. PORT OF ROOSEVELT	
02AA. MARINA DREDGING.....	11
02BA. ACCESS CHANNEL.....	11
02CA. DISPOSAL AREA CONSTRUCTION.....	11
15FA. UMATILLA PARK & MARINA	
02AA. MARINA DREDGING.....	12
02CA. DISPOSAL AREA CONSTRUCTION.....	12
15MA. MOB/DEMOB FROM VANCOUVER AREA	
02AA. MOB/DEMOB FROM VANCOUVER AREA.....	12
20. TOWBOATER'S DESIGN NAVIGATION	
01. MECHANICAL DREDGING	
15AA. MECHANICAL DREDGING	
02AA. DREDGING SILT/CLAY/SAND/GRAVEL.....	13

DETAILED ESTIMATE	DETAIL PAGE
02BA. DREDGING/BLASTING ROCK.....	13
02CA. DISPOSAL AREA CONSTRUCTION.....	13
02MB. Mob/Demob from Vancouver Area.....	13

BACKUP REPORTS	BACKUP PAGE
CREW BACKUP.....	1
LABOR BACKUP.....	2
EQUIPMENT BACKUP.....	3

* * * END TABLE OF CONTENTS * * *

	QUANTITY	UOM	TOTAL DIRECT	FOOH	HOOH	PROF	OTHR TAX	BOND	TOTAL COST	UNIT
JD JOHN DAY ALTERNATIVE 1 & 2 DRAWD										
JD.09 CHANNELS AND CANALS	1.00	JB	260,303,454	20824276	9,839,471	17458032		0 2,158,977	310,584,209	31051
TOTAL JOHN DAY ALTERNATIVE 1 & 2 DRAWD	1.00	JB	260,303,454	20824276	9,839,471	17458032		0 2,158,977	310,584,209	31051
TOTAL JOHN DAY NAV TOWBOATER'S DESIGN	1.00	JB	260,303,454	20824276	9,839,471	17458032		0 2,158,977	310,584,209	31051

Attachment B. Total Project Cost Summary Alternatives 3 & 4 - Towboater's Design

(US Army Corps of Engineers, Portland District, 1999)

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVE 3 Towboater's Design

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:		May-00				AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:		Oct-99				EFFECT. PRICING LEVEL: Oct 99								
ACCOUNT		COST	CNTG	CNTG	TOTAL	OMB	COST	CNTG	TOTAL	FEATURE	OMB	COST	CNTG	FULL
NUMBER	FEATURE DESCRIPTION	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	MID PT	(%)	(\$K)	(\$K)	(\$K)
JOHN DAY DAM AND RESERVOIR														
02- -	RELOCATIONS	99992	24,998	25%	124,990	3.3%	103,291	25,823	129,114	Apr-2012	47.6%	152,458	38,115	190,573
03- -	RESERVOIRS	218641	54,660	25%	273,302	3.3%	225,857	56,464	282,321	Apr-2012	47.6%	333,364	83,341	416,705
04- -	DAMS	782990	195,748	25%	978,738	3.3%	808,829	202,207	1,011,036	Apr-2012	47.6%	1,193,831	298,458	1,492,289
05- -	LOCKS	151232	37,808	25%	189,040	3.3%	156,223	39,056	195,278	Apr-2012	47.6%	230,585	57,646	288,231
06- -	FISH AND WILDLIFE FACILITIES	264	66	25%	330	3.3%	273	68	341	Apr-2012	47.6%	402	101	503
07- -	POWER PLANTS	9101	2,275	25%	11,376	3.3%	9,401	2,350	11,752	Apr-2012	47.6%	13,876	3,469	17,346
08- -	ROADS, RAILROADS AND BRIDGES	148423	37,106	25%	185,529	3.3%	153,321	38,330	191,651	Apr-2012	47.6%	226,302	56,575	282,877
09- -	CHANNELS AND CANALS	51450	12,863	25%	64,313	3.3%	53,148	13,287	66,435	Apr-2012	47.6%	78,447	19,612	98,058
09- -	CHANNELS & CANALS Navigation	546364	136,591	25%	682,955	3.3%	564,394	141,099	705,493	Apr-2012	47.6%	833,046	208,261	1,041,307
14- -	RECREATION FACILITIES	17218	4,304	25%	21,522	3.3%	17,786	4,446	22,232	Apr-2012	47.6%	26,252	6,563	32,815
16- -	BANK STABILIZATION	46364	11,591	25%	57,955	3.3%	47,894	11,973	59,867	Apr-2012	47.6%	70,692	17,673	88,364
18- -	CULTURAL RESOURCE PRESERVATION	64142	16,035	25%	80,177	3.3%	66,258	16,565	82,823	Apr-2012	47.6%	97,797	24,449	122,246
19- -	BUILDINGS, GROUNDS & UTILITIES	2278	570	25%	2,848	3.3%	2,353	588	2,942	Apr-2012	47.6%	3,474	868	4,342
McNARY MODIFICATIONS														
04- -	DAMS	10122	2,531	25%	12,653	3.3%	10,456	2,614	13,070	Apr-2012	47.6%	15,433	3,858	19,292
06- -	FISH AND WILDLIFE FACILITIES	4760	1,190	25%	5,951	3.3%	4,918	1,229	6,147	Apr-2012	47.6%	7,258	1,815	9,073
	TOTAL CONSTRUCTION COSTS =====>	2,153,342	538,335	25%	2,691,677	3.3%	2,224,402	556,100	2,780,502		47.6%	3,283,217	820,804	4,104,021
01- -	LANDS AND DAMAGES	122,527	30,631	25%	153,158	3.3%	126,570	31,642	158,212	Sep-2008	29.7%	164,161	41,040	205,201
18- -	CULTURAL RESOURCE PRESERVATION	21,533	5,383	25%	26,916	3.3%	22,244	5,561	27,805	Apr-2012	47.6%	32,832	8,208	41,040
30- -	PLANNING, ENGINEERING AND DESIGN	521,191	130,297	25%	651,488	4.6%	545,166	136,291	681,457	Mar-2007	34.3%	732,158	183,039	915,197
31- -	CONSTRUCTION MANAGEMENT	123,651	30,913	25%	154,564	4.6%	129,339	32,335	161,674	Apr-2012	65.0%	213,409	53,352	266,761
	TOTAL COST =====>	2,942,244	735,559	25%	3,677,803	3.6%	3,047,721	761,929	3,809,650		45.2%	4,425,777	1,106,443	5,532,220

NOTE: These costs are preliminary and are subject to change.

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVE 4 Towboater's Design

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:		May-00				AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:		Oct-99				EFFECT. PRICING LEVEL: Oct 99								
ACCOUNT NUMBER	FEATURE DESCRIPTION	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	OMB (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	FEATURE MID PT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
JOHN DAY DAM AND RESERVOIR														
02- -	RELOCATIONS	9962	2,490	25%	12,452	3.3%	10,290	2,573	12,863	Nov-2014	62.7%	16,743	4,186	20,928
03- -	RESERVOIRS	413057	103,264	25%	516,321	3.3%	426,688	106,672	533,360	Nov-2014	62.7%	694,221	173,555	867,776
04- -	DAMS	1512345	378,086	25%	1,890,431	3.3%	1,562,252	390,563	1,952,816	Nov-2014	62.7%	2,541,785	635,446	3,177,231
05- -	LOCKS	519340	129,835	25%	649,175	3.3%	536,478	134,119	670,597	Nov-2014	62.7%	872,850	218,212	1,091,062
06- -	FISH AND WILDLIFE FACILITIES	23801	5,950	25%	29,752	3.3%	24,587	6,147	30,733	Nov-2014	62.7%	40,002	10,001	50,003
07- -	POWER PLANTS	9101	2,275	25%	11,376	3.3%	9,401	2,350	11,752	Nov-2014	62.7%	15,296	3,824	19,120
08- -	ROADS, RAILROADS AND BRIDGES	148423	37,106	25%	185,529	3.3%	153,321	38,330	191,651	Nov-2014	62.7%	249,453	62,363	311,816
09- -	CHANNELS AND CANALS	51450	12,863	25%	64,313	3.3%	53,148	13,287	66,435	Nov-2014	62.7%	86,472	21,618	108,090
09- -	CHANNELS & CANALS Navigation	546364	136,591	25%	682,955	3.3%	564,394	141,099	705,493	Nov-2014	62.7%	918,269	229,567	1,147,837
14- -	RECREATION FACILITIES	17218	4,304	25%	21,522	3.3%	17,786	4,446	22,232	Nov-2014	62.7%	28,937	7,234	36,172
16- -	BANK STABILIZATION	46364	11,591	25%	57,955	3.3%	47,894	11,973	59,867	Nov-2014	62.7%	77,924	19,481	97,404
18- -	CULTURAL RESOURCE PRESERVATION	64142	16,035	25%	80,177	3.3%	66,258	16,565	82,823	Nov-2014	62.7%	107,802	26,951	134,753
19- -	BUILDINGS, GROUNDS & UTILITIES	1799	450	25%	2,248	3.3%	1,858	464	2,322	Nov-2014	62.7%	3,023	756	3,779
McNARY MODIFICATIONS														
04- -	DAMS	10126	2,532	25%	12,658	3.3%	10,461	2,615	13,076	Nov-2014	62.7%	17,019	4,255	21,274
06- -	FISH AND WILDLIFE FACILITIES	4760	1,190	25%	5,950	3.3%	4,917	1,229	6,146	Nov-2014	62.7%	8,000	2,000	10,000
	TOTAL CONSTRUCTION COSTS =====>	3,378,251	844,563	25%	4,222,814	3.3%	3,489,733	872,433	4,362,167		62.7%	5,677,796	1,419,449	7,097,245
01- -	LANDS AND DAMAGES	211,890	52,972	25%	264,862	3.3%	218,882	54,720	273,602	Sep-2008	29.7%	283,890	70,972	354,862
18- -	CULTURAL RESOURCE PRESERVATION	33,782	8,445	25%	42,227	3.3%	34,897	8,724	43,621	Nov-2014	62.7%	56,778	14,194	70,972
30- -	PLANNING, ENGINEERING AND DESIGN	901,316	225,329	25%	1,126,645	4.6%	942,777	235,694	1,178,471	Mar-2007	34.3%	1,266,149	316,537	1,582,686
31- -	CONSTRUCTION MANAGEMENT	189,590	47,398	25%	236,988	4.6%	198,311	49,578	247,889	Nov-2014	86.1%	369,057	92,264	461,321
	TOTAL COST =====>	4,714,829	1,178,707	25%	5,893,536	3.6%	4,884,600	1,221,149	6,105,750		56.7%	7,653,670	1,913,416	9,567,086

NOTE: These costs are preliminary and are subject to change.

Mon 24 Jul 2000
Eff. Date 10/01/99

PROJECT NATTWB: JOHN DAY NAV TOWBOATER'S DESIGN - JOHN DAY DAM DRAWDOWN
JOHN DAY DRAWDOWN NAVIGATION ALT 3 & 4

TITLE PAGE

JOHN DAY NAV TOWBOATER'S DESIGN
JOHN DAY DAM DRAWDOWN
CURRENT WORKING ESTIMATE
Effective Price Level 1 OCT 99
--- FOR OFFICIAL USE ONLY ---

Designed By: NWP Engineering Division
Estimated By: Skarbek

Prepared By: NWW-C, Cost Engineering Branch
Kim Callan, P.E., Branch Chief

Preparation Date: 05/30/00
Effective Date of Pricing: 10/01/99
Est Construction Time: 1308 Days

Sales Tax: 0.00%

This report is not copyrighted, but the information
contained herein is For Official Use Only.

M C A C E S F O R W I N D O W S
Software Copyright (c) 1985-1998
by Building Systems Design, Inc.
Release 1.2c

LABOR ID: OR99M2 EQUIP ID: NAT97C

Currency in DOLLARS

CREW ID: NAT99A UPB ID: UP99

PROJECT DESCRIPTION

This estimate consists of costs for the Navigation Dredging associated with the John Day Drawdown Phase 1 Study. This estimate examines the Towboater's Design for Alternatives 3 and 4, drawdown of the reservoir to natural river without and with flood control, respectively.

BASIS OF DESIGN

This is a current working estimate for the John Day Drawdown Phase 1 Study. It is based on quantities provided by the Corps of Engineers Portland District or through one of their contractors. This estimate uses unit costs developed from historical cost data.

CONSTRUCTION SCHEDULE

It is assumed dredging will occur prior to drawdown. Drawdown is scheduled to start on December 1, 2012.

CONSTRUCTION WINDOWS

It is assumed that dredging can occur for 200 days per year.

OVERTIME

This estimate does not use overtime.

ACQUISITION PLAN

It is assumed that four contracts will be acquired through the Bidding process. It is assumed that the work will not be performed by a contractor under the Small Business Administration 8a program.

SUB-CONTRACTING PLAN

This estimate does not use any subcontracting for the dredging work.

PROJECT CONSTRUCTION SITE ACCESS

The project site is located in the 73 mile long reservoir from the John Day Dam to the McNary Dam. Access is by floating plant.

BORROW AREAS

It is assumed that all material required for construction of the containment dikes will be available at the site of the containment areas.

CONSTRUCTION METHODOLOGY

The construction methodology is standard.

UNUSUAL CONDITION

There are no unusual conditions.

UNIQUE TECHNIQUES OF CONSTRUCTION

Construction is standard.

EQUIPMENT AND LABOR AVAILABILITY & DISTANCE TRAVELED

It is assumed that labor and equipment are available in the States of Oregon and Washington. With most of the floating plant coming from the Portland, OR/Vancouver WA area.

ENVIRONMENTAL CONCERNS

Allowances have been made for environmental concerns by limiting the dredging window to 200 days per year.

EQUIPMENT AND LABOR RATES

This estimate uses Davis Bacon labor rates for Sherman County, Oregon OR990017, Modification No 2 dated 4/02/99.

Equipment rates used are from EP 1110-1-8, Volume 8, September 1997.

Material prices were obtained from quotes, internet sources, pricing guides, supply catalogs and historical data (escalated to FY 1999), the MCACES National Unit Price Book UP99EB.

No sales tax has been applied.

The effective price level is 1 October 1998 (FY1999)

SUMMARY REPORTS	SUMMARY PAGE
PROJECT INDIRECT SUMMARY - FEATURE.....	1
PROJECT INDIRECT SUMMARY - BID ITEM.....	2
PROJECT INDIRECT SUMMARY - CSI ITEM.....	5
PROJECT DIRECT SUMMARY - FEATURE.....	11
PROJECT DIRECT SUMMARY - BID ITEM.....	12
PROJECT DIRECT SUMMARY - CSI ITEM.....	15

DETAILED ESTIMATE	DETAIL PAGE
JD. JOHN DAY ALTERNATIVE 3 & 4 DRAWD	
09. CHANNELS AND CANALS	
04. ALT3&4 PORTS & RECREATION	
01. PORT OF ARLINGTON	
91AA. CARGILL GRAIN ELEVATOR	
01AA. CARGILL GRAIN ELEVATOR.....	1
91BA. MARINA	
01AA. MARINA.....	1
91CA. CITY PARK	
01AA. CITY PARK.....	1
91DA. BOAT RAMP	
01AA. BOAT RAMP.....	2
02. BOARDMAN PARK & MARINA	
91AA. WELLS	
01AA. WELLS.....	2
91BA. DOCKS	
01AA. DOCKS.....	2
91CA. POOL (NEW REBUILD)	
01AA. POOL (NEW REBUILD).....	2
03. HOGUE-WARNER GRAIN ELEVATOR	
91BA. OPTION 2 MODIFY EXISTING	
01AA. OPTION 2 MODIFY EXISTING.....	3
04. IRRIGON MARINA	
91AA. BOAT RAMP & DOCKS	
01AA. BOAT RAMP & DOCKS.....	3
05. PORT OF MORROW	
91AA. AGGREGATE LOADING BARGE SLIP	
01AA. AGGREGATE LOADING BARGE SLIP.....	3
91BA. LONGVIEW CHIP RELOAD DOCK	
01AA. LONGVIEW CHIP RELOAD DOCK.....	3
91CA. CONTAINER BARGE SLIP	
01AA. CONTAINER BARGE SLIP.....	4
91DA. FACE DOCK	
01AA. FACE DOCK.....	4
91EA. TIDEWATER CHIP RELOAD DOCK	
01AA. TIDEWATER CHIP RELOAD DOCK.....	4
91FA. MESSNER COVE GRAIN TRMNL	
01AA. MESSNER COVE GRAIN TRMNL.....	4
91GA. AGGREGATE LOADING FACILITY	
01AA. AGGREGATE LOADING FACILITY.....	5
91HA. INFRASTRUCTURE	

DETAILED ESTIMATE	DETAIL PAGE
01AA. INFRASTRUCTURE.....	5
06. PORT OF ROOSEVELT	
91AA. GRAIN SILO	
01AA. GRAIN SILO.....	5
91BA. BARGE LOADER & PILINGS	
01AA. BARGE LOADER & PILINGS.....	5
91CA. ANNEX, BINS	
01AA. ANNEX, BINS.....	6
91DA. METAL TANK	
01AA. METAL TANK.....	6
91EA. ENTIRE PORT	
01AA. ENTIRE PORT.....	6
07. UMATILLA PARK & MARINA	
91AA. BOAT RAMP & DOCKS	
01AA. BOAT RAMP & DOCKS.....	6
05. ALT1,2,3&4 MECHANICAL DREDGING	
1. MECHANICAL DREDGING	
15AA. PORT OF ARLINGTON	
02AA. MARINA DREDGING.....	7
02CA. DISPOSAL AREA CONSTRUCTION.....	7
15BA. BOARDMAN PARK AND MARINA	
02AA. MARINA DREDGING.....	7
02CA. DISPOSAL AREA CONSTRUCTION.....	7
15CA. IRRIGON MARINA	
02AA. MARINA DREDGING.....	8
02CA. DISPOSAL AREA CONSTRUCTION.....	8
15DA. PORT OF MORROW	
02AA. BARGE SLIP 1 DREDGING.....	8
02BA. CHIP RELOAD DREDGING.....	9
02CA. CONTAINER TERMINAL.....	9
02DA. GRAIN RELOAD.....	9
02EA. GRAVEL RELOAD.....	9
02FA. TURNING BASIN.....	10
02GA. DISPOSAL AREA CONSTRUCTION.....	10
15EA. PORT OF ROOSEVELT	
02AA. MARINA DREDGING.....	10
02BA. ACCESS CHANNEL.....	10
02CA. DISPOSAL AREA CONSTRUCTION.....	11
15FA. UMATILLA PARK & MARINA	
02AA. MARINA DREDGING.....	11
02CA. DISPOSAL AREA CONSTRUCTION.....	11
15MA. MOB/DEMOB FROM VANCOUVER AREA	
02AA. MOB/DEMOB FROM VANCOUVER AREA.....	11
20. TOWBOATER'S DESIGN NAVIGATION	
01. MECHANICAL DREDGING	
15AA. MECHANICAL DREDGING	
02AA. DREDGING SILT/CLAY/SAND/GRAVEL.....	12
02BA. DREDGING/BLASTING ROCK.....	12
02CA. DISPOSAL AREA CONSTRUCTION.....	12
02MB. Mob/Demob from Vancouver Area.....	13

BACKUP REPORTS	BACKUP PAGE
CREW BACKUP.....	1
LABOR BACKUP.....	2
EQUIPMENT BACKUP.....	3

* * * END TABLE OF CONTENTS * * *

	QUANTITY	UOM	TOTAL DIRECT	FOOH	HOOH	PROF	OTHR TAX	BOND	TOTAL COST	UNIT
JD JOHN DAY ALTERNATIVE 3 & 4 DRAWD										
JD.09 CHANNELS AND CANALS	1.00	JB	457,458,550	36596684	17291933	30680830		0 4,336,224	546,364,221	54630
TOTAL JOHN DAY ALTERNATIVE 3 & 4 DRAWD	1.00	JB	457,458,550	36596684	17291933	30680830		0 4,336,224	546,364,221	54630
TOTAL JOHN DAY NAV TOWBOATER'S DESIGN	1.00	JB	457,458,550	36596684	17291933	30680830		0 4,336,224	546,364,221	54630

PROJECT NATTWB: JOHN DAY NAV TOWBOATER'S DESIGN - JOHN DAY DAM DRAWDOWN
 JOHN DAY DRAWDOWN NAVIGATION ALT 3 & 4
 ** PROJECT INDIRECT SUMMARY - BID ITEM **

		QUANTITY	UOM	TOTAL DIRECT	FOOH	HOOH	PROF	OTHR TAX	BOND	TOTAL COST	UNIT
JD JOHN DAY ALTERNATIVE 3 & 4 DRAWD											
JD.09 CHANNELS AND CANALS											
JD.09.04 ALT3&4 PORTS & RECREATION											
JD.09.04.01 PORT OF ARLINGTON											
JD.09.04.01-91AA	CARGILL GRAIN ELEVATOR	1.00	JB	4,000,000	320,000	151,200	268,272	0	37,916	4,777,388	47
JD.09.04.01-91BA	MARINA	1.00	JB	723,000	57,840	27,329	48,490	0	6,853	863,513	8635
JD.09.04.01-91CA	CITY PARK	1.00	JB	111,000	8,880	4,196	7,445	0	1,052	132,573	1325
JD.09.04.01-91DA	BOAT RAMP	1.00	JB	500,000	40,000	18,900	33,534	0	4,739	597,173	5971
TOTAL PORT OF ARLINGTON		1.00	JB	5,334,000	426,720	201,625	357,741	0	50,561	6,370,647	63
JD.09.04.02 BOARDMAN PARK & MARINA											
JD.09.04.02-91AA	WELLS	1.00	JB	150,000	12,000	5,670	10,060	0	1,422	179,152	1791
JD.09.04.02-91BA	DOCKS	1.00	JB	350,000	28,000	13,230	23,474	0	3,318	418,021	4180
JD.09.04.02-91CA	POOL (NEW REBUILD)	1.00	JB	2,000,000	160,000	75,600	134,136	0	18,958	2,388,694	2388
TOTAL BOARDMAN PARK & MARINA		1.00	JB	2,500,000	200,000	94,500	167,670	0	23,697	2,985,867	2985
JD.09.04.03 HOGUE-WARNER GRAIN ELEVATOR											
JD.09.04.03-91BA	OPTION 2 MODIFY EXISTING	1.00	JB	250,000	20,000	9,450	16,767	0	2,370	298,587	2985
TOTAL HOGUE-WARNER GRAIN ELEVATOR		1.00	JB	250,000	20,000	9,450	16,767	0	2,370	298,587	2985
JD.09.04.04 IRRIGON MARINA											
JD.09.04.04-91AA	BOAT RAMP & DOCKS	1.00	JB	700,000	56,000	26,460	46,948	0	6,635	836,043	8360
TOTAL IRRIGON MARINA		1.00	JB	700,000	56,000	26,460	46,948	0	6,635	836,043	8360
JD.09.04.05 PORT OF MORROW											
JD.09.04.05-91AA	AGGREGATE LOADING BARGE SLIP	1.00	JB	2,409,000	192,720	91,060	161,567	0	22,835	2,877,182	2877
JD.09.04.05-91BA	LONGVIEW CHIP RELOAD DOCK	1.00	JB	3,331,000	266,480	125,912	223,404	0	31,574	3,978,370	3978
JD.09.04.05-91CA	CONTAINER BARGE SLIP	1.00	JB	2,897,000	231,760	109,507	194,296	0	27,461	3,460,023	3460
JD.09.04.05-91DA	FACE DOCK	1.00	JB	621,000	49,680	23,474	41,649	0	5,886	741,689	7416
JD.09.04.05-91EA	TIDEWATER CHIP RELOAD DOCK	1.00	JB	1,153,000	92,240	43,583	77,329	0	10,929	1,377,082	1377
JD.09.04.05-91FA	MESSNER COVE GRAIN TRMNL	1.00	JB	10,990,000	879,200	415,422	737,077	0	104,174	13,125,873	13125
JD.09.04.05-91GA	AGGREGATE LOADING FACILITY	1.00	JB	913,000	73,040	34,511	61,233	0	8,654	1,090,439	1090
JD.09.04.05-91HA	INFRASTRUCTURE	1.00	JB	8,000,000	640,000	302,400	536,544	0	75,832	9,554,776	9554

Attachment C. Total Project Cost Summary Alternative 1 & 2 Pump

(US Army Corps of Engineers, Portland District, 1999)

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVE 1 & 2 IRRIGATION PUMP STATIONS

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:					AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE					
EFFECTIVE PRICING LEVEL:					EFFECT. PRICING LEVEL: Oct 99									
ACCOUNT		COST	CNTG	CNTG	TOTAL	OMB	COST	CNTG	TOTAL	FEATURE	OMB	COST	CNTG	FULL
NUMBER	FEATURE DESCRIPTION	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	MID PT	(%)	(\$K)	(\$K)	(\$K)
JOHN DAY DAM AND RESERVOIR														
02- - -	RELOCATIONS													
OR.02- - -	PUMP STATIONS OREGON	75319	18,830	25%	94,149	3.3%	77,804	19,451	97,255	Apr-2006	23.1%	95,777	23,944	119,721
WA.02- - -	PUMP STATIONS WASHINGTON	64417	16,104	25%	80,521	3.3%	66,543	16,636	83,178	Apr-2006	23.1%	81,914	20,479	102,393
	TOTAL CONSTRUCTION COSTS =====>	139,736	34,934	25%	174,670	3.3%	144,347	36,087	180,434		23.1%	177,691	44,423	222,114
01- - -	LANDS AND DAMAGES	6,987	1,746	25%	8,733	3.3%	7,218	1,804	9,022	Apr-2006	23.1%	8,885	2,221	11,106
18- - -	CULTURAL RESOURCE PRESERVATION	1,398	349	25%	1,747	3.3%	1,444	361	1,805	Apr-2006	23.1%	1,777	444	2,221
30- - -	PLANNING, ENGINEERING AND DESIGN	28,656	7,163	25%	35,819	4.6%	29,974	7,493	37,467	Apr-2006	32.2%	39,625	9,906	49,531
31- - -	CONSTRUCTION MANAGEMENT	8,353	2,088	25%	10,441	4.6%	8,737	2,184	10,921	Apr-2006	32.2%	11,550	2,887	14,437
	TOTAL COST =====>	185,130	46,280	25%	231,410	3.6%	191,720	47,929	239,649		24.9%	239,528	59,881	299,409

NOTE: These costs are preliminary and are subject to change.

OREGON PUMP STATIONS ALT 1&2 rev
JOHN DAY DRAWDOWN
CURRENT WORKING ESTIMATE
Effective Price Level 1 OCT 99
--- FOR OFFICIAL USE ONLY ---

Designed By: NWW Engineering Division
Estimated By: John Skarbek

Prepared By: NWW-C, Cost Engineering Branch
Kim Callan, P.E., Branch Chief

Preparation Date: 05/30/00
Effective Date of Pricing: 10/01/99
Est Construction Time: 400 Days

Sales Tax: 0.00%

This report is not copyrighted, but the information
contained herein is For Official Use Only.

M C A C E S F O R W I N D O W S
Software Copyright (c) 1985-1998
by Building Systems Design, Inc.
Release 1.2c

** BASIS OF ESTIMATE This estimate consists of costs to upgrade the existing privately owned pump stations along the Columbia River in Oregon affected by the drawdown of the John Day Reservoir to Spillway Crest. Costs are the same for each spillway crest alternative (with/without flood control). This estimate contains revisions from a technical review.

** PROJECT DESCRIPTION There are seventeen existing pump stations in Oregon withdrawing water from the John Day pool (Lake Umatilla) for irrigation. This estimate looks at one of the alternatives being investigated to provide water to all of the farms in Umatilla, Morrow and Gilliam Counties that would be impacted by the lowering of the pool elevation caused by the drawdown of the John Day reservoir. The work consists of modifying the existing pump stations by: installing new low lift pump

stations to provide water to the existing pump stations. Work includes excavation for new pipelines; installation of concrete weirs and pads; new pumps, manifolds, intake and discharge pipes; and new electrical service. Property acquisition is also required. ** BASIS OF DESIGN The work required, was established by Portland District and this estimate was prepared using those assumptions, tasks and quantities provided.

CONSTRUCTION

SCHEDULE The approximate construction schedule is as follows: Award Contracts April 2001 Drawdown of Reservoir commences February 2003 Construction Complete April 2004 CONSTRUCTION WINDOWS It is assumed that in water work for this project can only be accomplished during the normal in water work windows. This window occurs yearly and work is allowed during the months of December, January and February. The only work which will be impacted by this window is the installation of the intake pipes. All work will occur after the reservoir is drawn down. Contracts should be awarded as soon as possible so that long lead items can be obtained prior to commencement of work. OVERTIME This estimate does not contain any overtime.

ACQUISITION PLAN It is assumed that the contracts will be acquired through the bid process. SUB-CONTRACTING PLAN The following are subcontractors on this project: Mechanical Subcontractor (ME)

Electrical Subcontractor (EL) PROJECT CONSTRUCTION SITE ACCESS The project sites are located along the shore of Lake Umatilla in Oregon. Site access is from existing federal, state and local roads. BORROW AREAS

It is assumed that most fill material can be obtained on site or from excavation. Bedding material will be purchased from a supplier.

CONSTRUCTION METHODOLOGY The construction methodology is standard.

UNUSUAL CONDITION No unusual conditions are anticipated. UNIQUE TECHNIQUES OF CONSTRUCTION There are no unique techniques of construction.

EQUIPMENT AND LABOR AVAILABILITY & DISTANCE TRAVELED It is assumed that labor and equipment are available in the States of Oregon and Washington. ENVIRONMENTAL CONCERNS No environmental concerns are anticipated.

EQUIPMENT AND LABOR RATES This estimate uses Davis Bacon labor rates for Umatilla County, Washington. OR990017, Modification No 2 dated 4/02/99. Equipment rates used are from EP 1110-1-8, Volume 8, September 1997. Material prices were obtained from quotes, internet sources, pricing guides, supply catalogs, historical data (escalated to FY

1999), and the MCACES National Unit Price Book UP99EB. No sales tax
has been applied. The effective price level is 1 October 1998 (FY
1999) Contingencies and Escalation have not been applied in the MCACES
estimate. These will be accounted for in the Total Project Cost Summary
Spreadsheets.

SUMMARY REPORTS	SUMMARY PAGE
PROJECT INDIRECT SUMMARY - FEATURE.....	1
PROJECT INDIRECT SUMMARY - BID ITEM.....	2
PROJECT INDIRECT SUMMARY - CSI ITEM.....	11
PROJECT DIRECT SUMMARY - FEATURE.....	54
PROJECT DIRECT SUMMARY - BID ITEM.....	55
PROJECT DIRECT SUMMARY - CSI ITEM.....	64

DETAILED ESTIMATE	DETAIL PAGE
OR. PUMPING STATIONS OREGON	
02. RELOCATIONS	
01. PUMPING STATIONS	
21. BOEING/TAGGARES PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	1
02AA. 900 HP PUMP	
60AA. 900 HP PUMP.....	1
03AA. Valves Flanges and Fittings.....	1
04AA. FISH SCREENS	
15BA. Fish Screens.....	1
05AA. COFFERDAM	
20AA. Sheetpile.....	1
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	2
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	3
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	4
09AA. 72" DIA INTAKE PIPE (STEEL)	
02MC. 72" DIA INTAKE PIPE STEEL.....	5
10AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	5
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	5
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	6
13AA. 60" DIA PIPE (STEEL)	
02MC. 60" DIA STEEL PIPE.....	6
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	6
02FE. DISPOSAL.....	7
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	7
16AA. PIPE JACKING	
K02C. JACK/BORE PIPE, LARGE DIA.....	8
17AA. PIPE BEDDING	
02BA. Bedding Material.....	8
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	9
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	9

DETAILED ESTIMATE

DETAIL PAGE

20AA.	CONCRETE PAD	
	03DA. Slabs Structural Concrete.....	10
21AA.	ELECTRICAL & MECHANICAL HOOKUPS	
	15AA. MECHANICAL HOOKUPS.....	10
	16AA. ELECTRICAL HOOKUPS.....	11
22AA.	ELECTRICAL UTILITIES	
	16IA. ELECTRICAL UTILITIES.....	11
23AA.	GRAVEL (ACCESS ROAD)	
	02RA. Access Road Sitework/Earthwork.....	12
24AA.	Right-Of-Way Acquisition.....	12
22.	SULLIVAN PUMP STATION	
	01AA. MOB, DEMOB & PREPARATORY WORK.....	12
	02AA. 200 HP PUMP	
	60AA. 200 HP PUMP.....	13
	03AA. Valves Flanges and Fittings.....	13
	04AA. FISH SCREENS	
	15BA. Fish Screens.....	13
	05AA. COFFERDAM	
	20AA. Sheetpile.....	13
	06AA. DEWATERING PUMPING	
	15AA. Dewater Pumping - 10000 gpm.....	14
	07AA. EXCAVATION (EARTH) INTAKE PIPE	
	02EE. EXCAVATE (EARTH).....	15
	08AA. EXCAVATION (ROCK) INTAKE PIPE	
	02ER. EXCAVATE (ROCK).....	15
	09AA. 24" DIA INTAKE PIPE	
	02MB. 24" DIA INTAKE PIPE.....	17
	10AA. 24" DIA PIPE CAISSON & MANIFOLD	
	02MB. 24" DIA CAISSON & MANIFOLD.....	17
	11AA. EXCAVATE FOR CAISSON & MANIFOLD	
	02EX. Excavate Caisson & Manifold.....	17
	12AA. BACKFILL FOR CAISSON & MANIFOLD	
	02BA. Backfill for Caisson & manifold.....	17
	13AA. 18" DIA PIPE (STEEL)	
	02MC. 18" DIA STEEL PIPE.....	18
	14AA. EXCAVATION-EARTH DISCHARGE PIPE	
	02EE. EXCAVATE (EARTH).....	18
	02FE. DISPOSAL.....	18
	15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
	02ER. EXCAVATE (ROCK).....	19
	16AA. PIPE JACKING	
	K02C. Jack/Bore Pipe, Small Dia.....	20
	17AA. PIPE BEDDING	
	02BA. Bedding Material.....	20
	18AA. BACKFILL FOR PIPE	
	02BA. Backfill.....	20
	19AA. CONCRETE WEIR BOX	
	03CA. Walls Structural Concrete.....	21
	20AA. CONCRETE PAD	
	03DA. Slabs Structural Concrete.....	21
	21AA. ELECTRICAL & MECHANICAL HOOKUPS	

DETAILED ESTIMATE

DETAIL PAGE

15AA. MECHANICAL HOOKUPS.....	22
16AA. ELECTRICAL HOOKUPS.....	22
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	22
23AA. Right-Of-Way Acquisition.....	23
23. HARRIS (TRAFTON) PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	23
02AA. 50 HP PUMP	
60AA. 50 HP PUMP.....	23
03AA. Valves Flanges and Fittings.....	24
04AA. FISH SCREENS	
15BA. Fish Screens.....	24
05AA. COFFERDAM	
20AA. Sheetpile.....	24
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	25
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	26
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	26
09AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	27
10AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	28
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	28
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	28
13AA. 16" DIA PIPE (STEEL)	
02MC. 16" DIA STEEL PIPE.....	29
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	29
02FE. DISPOSAL.....	29
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	29
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small DIA.....	31
17AA. PIPE BEDDING	
02BA. Bedding Material.....	31
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	31
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	32
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	32
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	33
16AA. ELECTRICAL HOOKUPS.....	33
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	33
23AA. Right-Of-Way Acquisition.....	34

DETAILED ESTIMATE

DETAIL PAGE

24. BOARDMAN REST AREA PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	34
02AA. 25 HP PUMP	
60AA. 25 HP PUMP.....	34
03AA. Valves Flanges and Fittings.....	35
04AA. FISH SCREENS	
15BA. Fish Screens.....	35
05AA. COFFERDAM	
20AA. Sheetpile.....	35
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	36
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	37
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	37
09AA. 12" DIA INTAKE PIPE	
02MB. 12" DIA INTAKE PIPE.....	38
10AA. 18" DIA PIPE CAISSON & MANIFOLD	
02MB. 18" DIA CAISSON & MANIFOLD.....	39
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	39
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	39
13AA. 8" DIA PIPE (STEEL)	
02MC. 8" DIA STEEL PIPE.....	39
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	40
02FE. DISPOSAL.....	40
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	40
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small DIA.....	41
17AA. PIPE BEDDING	
02BA. Bedding Material.....	42
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	42
19AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	42
20AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	43
16AA. ELECTRICAL HOOKUPS.....	43
21AA. ELECTRICAL UTILITIES	
6IA . ELECTRICAL UTILITIES.....	44
22AA. Right-Of-Way Acquisition.....	44
25. CIRCLE C PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	45
02AA. 75 HP PUMP	
60AA. 75 HP PUMP.....	45
03AA. Valves Flanges and Fittings.....	45
04AA. FISH SCREENS	
15BA. Fish Screens.....	45

 DETAILED ESTIMATE

DETAIL PAGE

05AA. COFFERDAM	
20AA. Sheetpile.....	45
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	46
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	47
08AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	47
09AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	48
10AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	48
11AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	48
12AA. 18" DIA PIPE (STEEL)	
02MC. 18" DIA STEEL PIPE.....	49
13AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	49
02FE. DISPOSAL.....	49
14AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	49
15AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small DIA.....	51
16AA. PIPE BEDDING	
02BA. Bedding Material.....	51
17AA. BACKFILL FOR PIPE	
02BA. Backfill.....	51
18AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	52
19AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	52
20AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	53
16AA. ELECTRICAL HOOKUPS.....	53
21AA. ELECTRICAL UTILITIES	
6IA. ELECTRICAL UTILITIES.....	53
22AA. Right-Of-Way Acquisition.....	54
26. PORT OF MORROW PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	54
02AA. 300 HP PUMP	
60AA. 300 HP PUMP.....	54
03AA. Valves Flanges and Fittings.....	55
04AA. FISH SCREENS	
15BA. Fish Screens.....	55
05AA. COFFERDAM	
20AA. Sheetpile.....	55
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	56
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	57
08AA. EXCAVATION (ROCK) INTAKE PIPE	

DETAILED ESTIMATE

DETAIL PAGE

02ER. EXCAVATE (ROCK).....57
09AA. 42" DIA INTAKE PIPE (STEEL)
02MC. 42" DIA MANIFOLD (STEEL).....58
10AA. 36" DIA PIPE CAISSON & MANIFOLD
02MB. 36" DIA MANIFOLD (STEEL).....59
11AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....59
12AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....59
13AA. 42" DIA PIPE (STEEL)
02MC. 42" DIA STEEL PIPE.....60
14AA. EXCAVATION-EARTH DISCHARGE PIPE
02EE. EXCAVATE (EARTH).....60
02FE. DISPOSAL.....60
15AA. EXCAVATION (ROCK) DISCHARGE PIPE
02ER. EXCAVATE (ROCK).....60
16AA. PIPE JACKING
K02C. JACK/BORE PIPE, LARGE DIA.....62
17AA. PIPE BEDDING
02BA. Bedding Material.....62
18AA. BACKFILL FOR PIPE
02BA. Backfill.....62
19AA. CONCRETE WEIR BOX
03CA. Walls Structural Concrete.....63
20AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....63
21AA. ELECTRICAL & MECHANICAL HOOKUPS
15AA. MECHANICAL HOOKUPS.....64
16AA. ELECTRICAL HOOKUPS.....64
22AA. ELECTRICAL UTILITIES
16IA. ELECTRICAL UTILITIES.....64
23AA. GRAVEL (ACCESS ROAD)
02RA. Access Road Sitework/Earthwork.....65
24AA. Right-Of-Way Acquisition.....66
27. COLUMBIA IMPROVEMENT DISTRICT
01AA. MOB, DEMOB & PREPARATORY WORK.....66
02AA. Valves Flanges and Fittings.....66
03AA. FISH SCREENS
15BA. Fish Screens.....66
04AA. COFFERDAM
20AA. Sheetpile.....66
05AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....67
06AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....68
07AA. EXCAVATION (ROCK) INTAKE PIPE
02ER. EXCAVATE (ROCK).....69
08AA. 60" DIA INTAKE PIPE (STEEL)
02MC. 60" DIA INTAKE PIPE (STEEL).....70
09AA. 36" DIA PIPE CAISSON & MANIFOLD
02MB. 36" DIA MANIFOLD (STEEL).....70

DETAILED ESTIMATE	DETAIL PAGE
10AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	70
11AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	71
12AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	71
16AA. ELECTRICAL HOOKUPS.....	71
28. EASTERN OREGON FARMING COMPANY	
01AA. MOB, DEMOB & PREPARATORY WORK.....	72
02AA. 350 HP PUMP	
60AA. 350 HP PUMP.....	72
03AA. 300 HP PUMP	
60AA. 300 HP PUMP.....	72
04AA. 250 HP PUMP	
60AA. 250 HP PUMP.....	72
05AA. Valves Flanges and Fittings.....	73
06AA. FISH SCREENS	
15BA. Fish Screens.....	73
07AA. COFFERDAM	
20AA. Sheetpile.....	73
08AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	74
09AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	75
10AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	75
11AA. 48" DIA INTAKE PIPE (STEEL)	
02MC. 48" DIA INTAKE PIPE (STEEL).....	76
12AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	77
13AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	77
14AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	77
15AA. 42" DIA PIPE (STEEL)	
02MC. 42" DIA STEEL PIPE.....	78
16AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	78
02FE. DISPOSAL.....	78
17AA. PIPE BEDDING	
02BA. Bedding Material.....	78
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	79
29. WESTERN EMPIRE #2 PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	79
02AA. 200 HP PUMP	
60AA. 200 HP PUMP.....	79
03AA. Valves Flanges and Fittings.....	80
04AA. FISH SCREENS	
15BA. Fish Screens.....	80
05AA. COFFERDAM	

DETAILED ESTIMATE	DETAIL PAGE
20AA. Sheetpile.....	80
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	81
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	82
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	82
09AA. 48" DIA INTAKE PIPE (STEEL)	
02MC. 48" DIA INTAKE PIPE (STEEL).....	83
10AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	84
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	84
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	84
13AA. 42" DIA PIPE (STEEL)	
02MC. 42" DIA STEEL PIPE.....	85
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	85
02FE. DISPOSAL.....	85
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	85
16AA. PIPE BEDDING	
02BA. Bedding Material.....	87
17AA. BACKFILL FOR PIPE	
02BA. Backfill.....	87
18AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	87
19AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	88
20AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	89
16AA. ELECTRICAL HOOKUPS.....	89
21AA. ELECTRICAL UTILITIES	
16IA. ELECTRICAL UTILITIES.....	89
22AA. Right-Of-Way Acquisition.....	90
30. WESTERN EMPIRE #1 PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	90
02AA. FISH SCREENS	
15BA. Fish Screens.....	90
03AA. COFFERDAM	
20AA. Sheetpile.....	90
04AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	91
05AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	92
06AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	92
07AA. 32" DIA INTAKE PIPE (STEEL)	
02MC. 32" DIA INTAKE PIPE (STEEL).....	94
08AA. 30" DIA PIPE CAISSON & MANIFOLD	

DETAILED ESTIMATE	DETAIL PAGE
02MB. 30" DIA MANIFOLD (STEEL).....	94
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	94
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	94
31. WEST IRRIGATION DISTRICT #2	
01AA. MOB, DEMOB & PREPARATORY WORK.....	95
02AA. FISH SCREENS	
15BA. Fish Screens.....	95
03AA. COFFERDAM	
20AA. Sheetpile.....	95
04AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	96
05AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	97
06AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	97
07AA. 24" DIA INTAKE PIPE (STEEL)	
02MC. 24" DIA INTAKE PIPE (STEEL).....	99
08AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA MANIFOLD (STEEL).....	99
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	99
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	99
32. STREBIN FARMS PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	100
02AA. 150 HP PUMP	
60AA. 150 HP PUMP.....	100
03AA. Valves Flanges and Fittings.....	100
04AA. FISH SCREENS	
15BA. Fish Screens.....	100
05AA. COFFERDAM	
20AA. Sheetpile.....	100
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	101
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	102
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	103
09AA. 36" DIA INTAKE PIPE (STEEL)	
02MC. 36" DIA INTAKE PIPE (STEEL).....	104
10AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	104
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	104
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	105
13AA. 30" DIA PIPE (STEEL)	
02MC. 30" DIA STEEL PIPE.....	105
14AA. EXCAVATION EARTH DISCHARGE PIPE	

DETAILED ESTIMATE

DETAIL PAGE

02EE. EXCAVATE (EARTH).....105
 02FE. DISPOSAL.....106
 15AA. PIPE BEDDING
 02BA. Bedding Material.....106
 16AA. BACKFILL FOR PIPE
 02BA. Backfill.....106
 17AA. CONCRETE WEIR BOX
 03CA. Walls Structural Concrete.....107
 18AA. CONCRETE PAD
 03DA. Slabs Structural Concrete.....107
 19AA. ELECTRICAL & MECHANICAL HOOKUPS
 15AA. MECHANICAL HOOKUPS.....108
 16AA. ELECTRICAL HOOKUPS.....108
 20AA. ELECTRICAL UTILITIES
 16IA. ELECTRICAL UTILITIES.....108
 21AA. Right-Of-Way Acquisition.....109
 33. PERKINS FARMS PUMP STATION
 01AA. MOB, DEMOB & PREPARATORY WORK.....109
 02AA. FISH SCREENS
 15BA. Fish Screens.....109
 03AA. COFFERDAM
 20AA. Sheetpile.....110
 04AA. DEWATERING PUMPING
 15AA. Dewater Pumping - 10000 gpm.....111
 05AA. EXCAVATION (EARTH) INTAKE PIPE
 02EE. EXCAVATE (EARTH).....112
 06AA. EXCAVATION (ROCK) INTAKE PIPE
 02ER. EXCAVATE (ROCK).....112
 07AA. 42" DIA INTAKE PIPE (STEEL)
 02MC. 42" DIA INTAKE PIPE (STEEL).....113
 08AA. 32" DIA PIPE CAISSON & MANIFOLD
 02MB. 32" DIA MANIFOLD (STEEL).....113
 09AA. EXCAVATE FOR CAISSON & MANIFOLD
 02EX. Excavate Caisson & Manifold.....114
 10AA. BACKFILL FOR CAISSON & MANIFOLD
 02BA. Backfill for Caisson & manifold.....114
 34. C&B LIVESTOCK PUMP STATION
 01AA. MOB, DEMOB & PREPARATORY WORK.....114
 02AA. FISH SCREENS
 15BA. Fish Screens.....114
 03AA. COFFERDAM
 20AA. Sheetpile.....115
 04AA. DEWATERING PUMPING
 15AA. Dewater Pumping - 10000 gpm.....116
 05AA. EXCAVATION (EARTH) INTAKE PIPE
 02EE. EXCAVATE (EARTH).....117
 06AA. EXCAVATION (ROCK) INTAKE PIPE
 02ER. EXCAVATE (ROCK).....117
 07AA. 48" DIA INTAKE PIPE (STEEL)
 02MC. 48" DIA INTAKE PIPE (STEEL).....118
 08AA. 36" DIA PIPE CAISSON & MANIFOLD

DETAILED ESTIMATE

DETAIL PAGE

02MB. 36" DIA MANIFOLD (STEEL).....	118
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	119
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	119
35. LEONARD FARM PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	119
02AA. 100 HP PUMP	
60AA. 100 HP PUMP.....	119
03AA. Valves Flanges and Fittings.....	120
04AA. FISH SCREENS	
15BA. Fish Screens.....	120
05AA. COFFERDAM	
20AA. Sheetpile.....	120
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	121
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	122
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	122
09AA. 30" DIA INTAKE PIPE	
02MB. 30" DIA INTAKE PIPE.....	123
10AA. 30" DIA PIPE CAISSON & MANIFOLD	
02MB. 30" DIA CAISSON & MANIFOLD.....	124
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	124
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	124
13AA. 24" DIA PIPE (STEEL)	
02MC. 24" DIA STEEL PIPE.....	125
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	125
02FE. DISPOSAL.....	125
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	125
16AA. PIPE JACKING	
K02C. JACK/BORE PIPE, SMALL DIA.....	127
17AA. PIPE BEDDING	
02BA. Bedding Material.....	127
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	127
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	128
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	128
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	129
16AA. ELECTRICAL HOOKUPS.....	129
22AA. ELECTRICAL UTILITIES	
6IA. ELECTRICAL UTILITIES.....	129
23AA. GRAVEL (ACCESS ROAD)	

DETAILED ESTIMATE

DETAIL PAGE

02RA. Access Road Sitework/Earthwork.....130
24AA. Right-Of-Way Acquisition.....131
36. WEST EXTENSION IRRIGATION
01AA. MOB, DEMOB & PREPARATORY WORK.....131
02AA. 200 HP PUMP
60AA. 200 HP PUMP.....131
03AA. Valves Flanges and Fittings.....131
04AA. FISH SCREENS
15BA. Fish Screens.....131
05AA. COFFERDAM
20AA. Sheetpile.....132
06AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....133
07AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....134
08AA. EXCAVATION (ROCK) INTAKE PIPE
02ER. EXCAVATE (ROCK).....134
09AA. 48" DIA INTAKE PIPE
02MB. 48" DIA INTAKE PIPE.....135
10AA. 36" DIA PIPE CAISSON & MANIFOLD
02MB. 36" DIA PIPE CAISSON & MANIFOLD.....135
11AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....136
12AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....136
13AA. 42" DIA PIPE (STEEL)
02MC. 42" DIA STEEL PIPE.....136
14AA. EXCAVATION-EARTH DISCHARGE PIPE
02EE. EXCAVATE (EARTH).....137
02FE. DISPOSAL.....137
15AA. EXCAVATION (ROCK) DISCHARGE PIPE
02ER. EXCAVATE (ROCK).....137
16AA. PIPE JACKING
K02C. Jack/Bore Pipe, Large DIA.....138
17AA. PIPE BEDDING
02BA. Bedding Material.....139
18AA. BACKFILL FOR PIPE
02BA. Backfill.....139
19AA. CONCRETE WEIR BOX
03CA. Walls Structural Concrete.....139
20AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....140
21AA. ELECTRICAL & MECHANICAL HOOKUPS
15AA. MECHANICAL HOOKUPS.....141
16AA. ELECTRICAL HOOKUPS.....141
22AA. ELECTRICAL UTILITIES
6IA . ELECTRICAL UTILITIES.....141
23AA. Right-Of-Way Acquisition.....142
37. UMATILLA HS PUMP STATION
01AA. MOB, DEMOB & PREPARATORY WORK.....142
02AA. 25 HP PUMP

DETAILED ESTIMATE	DETAIL PAGE
60AA. 25 HP PUMP.....	142
03AA. Valves Flanges and Fittings.....	142
04AA. FISH SCREENS	
15BA. FISH SCREENS.....	142
05AA. COFFERDAM	
20AA. Sheetpile.....	143
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	144
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	145
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	145
09AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	146
10AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	146
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	147
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	147
13AA. 12" DIA PIPE (STEEL)	
02MC. 12" DIA STEEL PIPE.....	147
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	147
02FE. DISPOSAL.....	148
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	148
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small Dia.....	149
17AA. PIPE BEDDING	
02BA. Bedding Material.....	150
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	150
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	150
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	151
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	152
16AA. ELECTRICAL HOOKUPS.....	152
22AA. ELECTRICAL UTILITIES	
6IA. ELECTRICAL UTILITIES.....	152
23AA. Right-Of-Way Acquisition.....	153

BACKUP REPORTS	BACKUP PAGE
CREW BACKUP.....	1
LABOR BACKUP.....	8
EQUIPMENT BACKUP.....	9

Eff. Date 10/01/99

PROJECT ORA1PS: OREGON PUMP STATIONS ALT 1&2 rev - JOHN DAY DRAWDOWN
Irrigation Modifications OR Alt 1 & 2 rev 1
** PROJECT INDIRECT SUMMARY - FEATURE **

SUMMARY PAGE

	QUANTITY	UOM	TOTAL DIRECT	FOOH	HOOH	PROF	OTHR TAX	BOND	TOTAL COST	UNIT
OR PUMPING STATIONS OREGON										
OR.02 RELOCATIONS	1.00	EA	63,125,417	5,050,033	2,386,141	4,233,695	0	523,567	75,318,854	753
TOTAL PUMPING STATIONS OREGON			63,125,417	5,050,033	2,386,141	4,233,695	0	523,567	75,318,854	
TOTAL OREGON PUMP STATIONS ALT 1&2 rev			63,125,417	5,050,033	2,386,141	4,233,695	0	523,567	75,318,854	

Attachment D. Total Project Cost Summary Alternative 3 & 4 Pump

(US Army Corps of Engineers, Portland District, 1999)

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVES 3 & 4 IRRIGATION PUMP STATIONS

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:		May-00				AUTHORIZ./BUDGET YEAR: 1999				FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:		Oct-99				EFFECT. PRICING LEVEL: Oct 99								
ACCOUNT NUMBER	FEATURE DESCRIPTION	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	OMB (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	FEATURE MID PT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
JOHN DAY DAM AND RESERVOIR														
02 - -	RELOCATIONS													
OR.02 - -	PUMP STATIONS OREGON	76277	19,069	25%	95,346	3.3%	78,794	19,698	98,492	Apr-2006	23.1%	96,995	24,249	121,244
WA.02 - -	PUMP STATIONS WASHINGTON	64473	16,118	25%	80,592	3.3%	66,601	16,650	83,251	Apr-2006	23.1%	81,986	20,496	102,482
	TOTAL CONSTRUCTION COSTS =====>	140,750	35,188	25%	175,938	3.3%	145,395	36,349	181,744		23.1%	178,981	44,745	223,726
01 - - -	LANDS AND DAMAGES	6,680	1,670	25%	8,350	3.3%	6,900	1,725	8,625	Sep-2008	29.7%	8,949	2,237	11,186
18 - - -	CULTURAL RESOURCE PRESERVATION	1,174	293	25%	1,467	3.3%	1,213	303	1,516	Apr-2012	47.6%	1,790	447	2,237
30 - - -	PLANNING, ENGINEERING AND DESIGN	28,412	7,103	25%	35,515	4.6%	29,719	7,430	37,149	Mar-2007	34.3%	39,913	9,978	49,891
31 - - -	CONSTRUCTION MANAGEMENT	6,741	1,685	25%	8,426	4.6%	7,051	1,762	8,813	Apr-2012	65.0%	11,634	2,908	14,542
	TOTAL COST =====>	183,757	45,939	25%	229,696	3.5%	190,278	47,569	237,847		26.8%	241,267	60,315	301,582

NOTE: These costs are preliminary and are subject to change.

Mon 24 Jul 2000
Eff. Date 10/01/99

Triservice Automated Cost Engineering System (TRACES)
PROJECT OR17PS: OREGON PUMP STATIONS ALT 3&4 - JOHN DAY DRAWDOWN
Irrigation Modifications - OR Alt 3 & 4 Rev 1

TIME 13:3
TITLE PAGE

OREGON PUMP STATIONS ALT 3&4
JOHN DAY DRAWDOWN
BUDGET ESTIMATE
Effective Price Level 1 OCT 99
--- FOR OFFICIAL USE ONLY ---

Designed By: NWW Engineering Division
Estimated By: John Skarbek

Prepared By: NWW-C, Cost Engineering Branch
Kim Callan, P.E., Branch Chief

Preparation Date: 05/30/00
Effective Date of Pricing: 10/01/99
Est Construction Time: 400 Days

Sales Tax: 0.00%

This report is not copyrighted, but the information
contained herein is For Official Use Only.

M C A C E S F O R W I N D O W S
Software Copyright (c) 1985-1998
by Building Systems Design, Inc.
Release 1.2c

LABOR ID: OR99M2 EQUIP ID: NAT97C

Currency in DOLLARS

CREW ID: NAT99A UPB ID: UP99E

** BASIS OF ESTIMATE This estimate consists of costs to upgrade the existing privately owned pump stations along the Columbia River in Oregon affected by the drawdown of the John Day Reservoir to Natural River. Costs are the same for each natural river alternative (with/without flood control) This estimate contains revisions from a technical review.

** PROJECT DESCRIPTION There are seventeen existing pump stations in Oregon withdrawing water from the John Day pool (Lake Umatilla) for irrigation. This estimate looks at one of the alternatives being investigated to provide water to all of the farms in Umatilla, Morrow and Gilliam Counties that would be impacted by the lowering of the pool elevation caused by the drawdown of the John Day reservoir. The work consists of modifying the existing pump stations by: installing new low lift pump stations to provide water to the existing pump stations. Work includes excavation for new pipelines; installation of concrete weirs and pads; new pumps, manifolds, intake and discharge pipes; and new electrical service. Property acquisition is also required.

** BASIS OF DESIGN The work required, was established by Portland District and this estimate was prepared using those assumptions, tasks and quantities provided.

CONSTRUCTION

SCHEDULE The approximate construction schedule is as follows: Award Contracts April 2001 Drawdown of Reservoir commences February 2003 Construction Complete April 2004 CONSTRUCTION WINDOWS It is assumed that in water work for this project can only be accomplished during the normal in water work windows. This window occurs yearly and work is allowed during the months of December, January and February. The only work which will be impacted by this window is the installation of the intake pipes. All work will occur after the reservoir is drawn down. Contracts should be awarded as soon as possible so that long lead items can be obtained prior to commencement of work. OVERTIME This estimate does not contain any overtime.

ACQUISITION PLAN It is assumed that the contracts will be acquired through the bid process. SUB-CONTRACTING PLAN The following are subcontractors on this project: Mechanical Subcontractor (ME)

Electrical Subcontractor (EL) PROJECT CONSTRUCTION SITE ACCESS The project sites are located along the shore of Lake Umatilla in Oregon. Site access is from existing federal, state and local roads. BORROW AREAS

It is assumed that most fill material can be obtained on site or from the excavation. Bedding material will be purchased from a supplier.

CONSTRUCTION METHODOLOGY The construction methodology is standard.

UNUSUAL CONDITION No unusual conditions are anticipated. UNIQUE TECHNIQUES OF CONSTRUCTION There are no unique techniques of construction.

EQUIPMENT AND LABOR AVAILABILITY & DISTANCE TRAVELED It is assumed that labor and equipment are available in the States of Oregon and Washington. ENVIRONMENTAL CONCERNS No environmental concerns are anticipated. EQUIPMENT AND LABOR RATES This estimate uses

Davis Bacon labor rates for Umatilla County, Washington. OR990017, Modification No 2 dated 4/02/99. Equipment rates used are from EP 1110-1-8, Volume 8, September 1997. Material prices were obtained from quotes, internet sources, pricing guides, supply catalogs, historical data (escalated to FY 1999), and the MCACES National Unit Price Book UP99EB. No sales tax

has been applied. The effective price level is 1 October 1998 (FY 1999) Contingencies and Escalation have not been applied in the MCACES estimate. These will be accounted for in the Total Project Cost Summary Spreadsheets.

SUMMARY REPORTS	SUMMARY PAGE
PROJECT INDIRECT SUMMARY - FEATURE.....	1
PROJECT INDIRECT SUMMARY - BID ITEM.....	2
PROJECT INDIRECT SUMMARY - CSI ITEM.....	11
PROJECT DIRECT SUMMARY - FEATURE.....	55
PROJECT DIRECT SUMMARY - BID ITEM.....	56
PROJECT DIRECT SUMMARY - CSI ITEM.....	65

DETAILED ESTIMATE	DETAIL PAGE
OR. PUMPING STATIONS OREGON	
02. RELOCATIONS	
01. PUMPING STATIONS	
21. BOEING/TAGGARES PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	1
02AA. 1000 HP PUMP	
60AA. 1000 HP PUMP.....	1
03AA. Valves Flanges and Fittings.....	1
04AA. FISH SCREENS	
15BA. Fish Screens.....	1
05AA. COFFERDAM	
20AA. Sheetpile.....	1
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	2
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	3
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	4
09AA. 72" DIA INTAKE PIPE (STEEL)	
02MC. 72" DIA INTAKE PIPE STEEL.....	5
10AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	5
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	5
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	5
13AA. 60" DIA PIPE (STEEL)	
02MC. 60" DIA STEEL PIPE.....	6
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	6
02FE. DISPOSAL.....	6
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	7
16AA. PIPE JACKING	
K02C. JACK/BORE PIPE, LARGE DIA.....	8
17AA. PIPE BEDDING	
02BA. Bedding Material.....	8
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	8
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	9

DETAILED ESTIMATE	DETAIL PAGE
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	9
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	10
16AA. ELECTRICAL HOOKUPS.....	10
22AA. ELECTRICAL UTILITIES	
161A. ELECTRICAL UTILITIES.....	11
23AA. GRAVEL (ACCESS ROAD)	
02RA. Access Road Sitework/Earthwork.....	11
24AA. Right-Of-Way Acquisition.....	12
22. SULLIVAN PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	12
02AA. 250 HP PUMP	
60AA. 250 HP PUMP.....	12
03AA. Valves Flanges and Fittings.....	13
04AA. FISH SCREENS	
15BA. Fish Screens.....	13
05AA. COFFERDAM	
20AA. Sheetpile.....	13
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	14
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	15
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	15
09AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	16
10AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	16
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	17
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	17
13AA. 18" DIA PIPE (STEEL)	
02MC. 18" DIA STEEL PIPE.....	17
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	18
02FE. DISPOSAL.....	18
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	18
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small Dia.....	19
17AA. PIPE BEDDING	
02BA. Bedding Material.....	20
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	20
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	20
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	21
21AA. ELECTRICAL & MECHANICAL HOOKUPS	

DETAILED ESTIMATE	DETAIL PAGE
15AA. MECHANICAL HOOKUPS.....	22
16AA. ELECTRICAL HOOKUPS.....	22
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	22
23AA. Right-Of-Way Acquisition.....	23
23. HARRIS (TRAFTON) PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	23
02AA. 50 HP PUMP	
60AA. 50 HP PUMP.....	23
03AA. Valves Flanges and Fittings.....	23
04AA. FISH SCREENS	
15BA. Fish Screens.....	23
05AA. COFFERDAM	
20AA. Sheetpile.....	24
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	25
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	26
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	26
09AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	27
10AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	27
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	27
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	28
13AA. 16" DIA PIPE (STEEL)	
02MC. 16" DIA STEEL PIPE.....	28
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	28
02FE. DISPOSAL.....	29
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	29
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small DIA.....	30
17AA. PIPE BEDDING	
02BA. Bedding Material.....	30
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	31
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	31
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	32
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	32
16AA. ELECTRICAL HOOKUPS.....	33
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	33
23AA. Right-Of-Way Acquisition.....	33

DETAILED ESTIMATE

DETAIL PAGE

24. BOARDMAN REST AREA PUMP STATION

- 01AA. MOB, DEMOB & PREPARATORY WORK.....34
- 02AA. 25 HP PUMP
 - 60AA. 25 HP PUMP.....34
- 03AA. Valves Flanges and Fittings.....34
- 04AA. FISH SCREENS
 - 15BA. Fish Screens.....34
- 05AA. COFFERDAM
 - 20AA. Sheetpile.....34
- 06AA. DEWATERING PUMPING
 - 15AA. Dewater Pumping - 10000 gpm.....35
- 07AA. EXCAVATION (EARTH) INTAKE PIPE
 - 02EE. EXCAVATE (EARTH).....36
- 08AA. EXCAVATION (ROCK) INTAKE PIPE
 - 02ER. EXCAVATE (ROCK).....37
- 09AA. 12" DIA INTAKE PIPE
 - 02MB. 12" DIA INTAKE PIPE.....38
- 10AA. 18" DIA PIPE CAISSON & MANIFOLD
 - 02MB. 18" DIA CAISSON & MANIFOLD.....38
- 11AA. EXCAVATE FOR CAISSON & MANIFOLD
 - 02EX. Excavate Caisson & Manifold.....38
- 12AA. BACKFILL FOR CAISSON & MANIFOLD
 - 02BA. Backfill for Caisson & manifold.....38
- 13AA. 8" DIA PIPE (STEEL)
 - 02MC. 8" DIA STEEL PIPE.....39
- 14AA. EXCAVATION-EARTH DISCHARGE PIPE
 - 02EE. EXCAVATE (EARTH).....39
 - 02FE. DISPOSAL.....39
- 15AA. EXCAVATION (ROCK) DISCHARGE PIPE
 - 02ER. EXCAVATE (ROCK).....40
- 16AA. PIPE JACKING
 - K02C. Jack/Bore Pipe, Small DIA.....41
- 17AA. PIPE BEDDING
 - 02BA. Bedding Material.....41
- 18AA. BACKFILL FOR PIPE
 - 02BA. Backfill.....41
- 19AA. CONCRETE PAD
 - 03DA. Slabs Structural Concrete.....42
- 20AA. ELECTRICAL & MECHANICAL HOOKUPS
 - 15AA. MECHANICAL HOOKUPS.....42
 - 16AA. ELECTRICAL HOOKUPS.....43
- 21AA. ELECTRICAL UTILITIES
 - 61A . ELECTRICAL UTILITIES.....43
- 22AA. Right-Of-Way Acquisition.....44

25. CIRCLE C PUMP STATION

- 01AA. MOB, DEMOB & PREPARATORY WORK.....44
- 02AA. 75 HP PUMP
 - 60AA. 75 HP PUMP.....44
- 03AA. Valves Flanges and Fittings.....44
- 04AA. FISH SCREENS
 - 15BA. Fish Screens.....44

DETAILED ESTIMATE

DETAIL PAGE

05AA. COFFERDAM
20AA. Sheetpile.....45

06AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....46

07AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....47

08AA. 24" DIA INTAKE PIPE
02MB. 24" DIA INTAKE PIPE.....47

09AA. 24" DIA PIPE CAISSON & MANIFOLD
02MB. 24" DIA CAISSON & MANIFOLD.....47

10AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....47

11AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....48

12AA. 18" DIA PIPE (STEEL)
02MC. 18" DIA STEEL PIPE.....48

13AA. EXCAVATION-EARTH DISCHARGE PIPE
02EE. EXCAVATE (EARTH).....48
02FE. DISPOSAL.....49

14AA. EXCAVATION (ROCK) DISCHARGE PIPE
02ER. EXCAVATE (ROCK).....49

15AA. PIPE JACKING
K02C. Jack/Bore Pipe, Small DIA.....50

16AA. PIPE BEDDING
02BA. Bedding Material.....50

17AA. BACKFILL FOR PIPE
02BA. Backfill.....51

18AA. CONCRETE WEIR BOX
03CA. Walls Structural Concrete.....51

19AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....52

20AA. ELECTRICAL & MECHANICAL HOOKUPS
15AA. MECHANICAL HOOKUPS.....52
16AA. ELECTRICAL HOOKUPS.....53

21AA. ELECTRICAL UTILITIES
6IA . ELECTRICAL UTILITIES.....53

22AA. Right-Of-Way Acquisition.....53

26. PORT OF MORROW PUMP STATION
01AA. MOB, DEMOB & PREPARATORY WORK.....54
02AA. 300 HP PUMP
60AA. 300 HP PUMP.....54
03AA. Valves Flanges and Fittings.....54
04AA. FISH SCREENS
15BA. Fish Screens.....54

05AB. COFFERDAM
20AA. Sheetpile.....54

06AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....55

07AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....56

08AA. EXCAVATION (ROCK) INTAKE PIPE

DETAILED ESTIMATE	DETAIL PAGE
02ER. EXCAVATE (ROCK).....	57
09AA. 42" DIA INTAKE PIPE (STEEL)	
02MC. 42" DIA MANIFOLD (STEEL).....	58
10AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	58
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	58
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	58
13AA. 42" DIA PIPE (STEEL)	
02MC. 42" DIA STEEL PIPE.....	59
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	59
02FE. DISPOSAL.....	59
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	60
16AA. PIPE JACKING	
K02C. JACK/BORE PIPE, LARGE DIA.....	61
17AA. PIPE BEDDING	
02BA. Bedding Material.....	61
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	61
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	62
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	62
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	63
16AA. ELECTRICAL HOOKUPS.....	63
22AA. ELECTRICAL UTILITIES	
16IA. ELECTRICAL UTILITIES.....	63
23AA. GRAVEL (ACCESS ROAD)	
02RA. Access Road Sitework/Earthwork.....	64
24AA. Right-Of-Way Acquisition.....	65
27. COLUMBIA IMPROVEMENT DISTRICT	
01AA. MOB, DEMOB & PREPARATORY WORK.....	65
02AA. Valves Flanges and Fittings.....	65
03AA. FISH SCREENS	
15BA. Fish Screens.....	65
04AA. COFFERDAM	
20AA. Sheetpile.....	66
05AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	67
06AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	68
07AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	68
08AA. 60" DIA INTAKE PIPE (STEEL)	
02MC. 60" DIA INTAKE PIPE (STEEL).....	69
09AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	69

 DETAILED ESTIMATE

DETAIL PAGE

10AA.	EXCAVATE FOR CAISSON & MANIFOLD	
02EX.	Excavate Caisson & Manifold.....	69
11AA.	BACKFILL FOR CAISSON & MANIFOLD	
02BA.	Backfill for Caisson & manifold.....	70
12AA.	ELECTRICAL & MECHANICAL HOOKUPS	
15AA.	MECHANICAL HOOKUPS.....	70
16AA.	ELECTRICAL HOOKUPS.....	70
13AA.	EMBANKMENT FOR ACCESS ROAD	
02RD.	EMBANKMENT FOR ACCESS ROAD.....	70
14AA.	GRAVEL (ACCESS ROAD)	
02RA.	Access Road Sitework/Earthwork.....	71
28.	EASTERN OREGON FARMING COMPANY	
01AA.	MOB, DEMOB & PREPARATORY WORK.....	72
02AA.	350 HP PUMP	
60AA.	350 HP PUMP.....	72
03AA.	300 HP PUMP	
60AA.	300 HP PUMP.....	72
04AA.	250 HP PUMP	
60AA.	250 HP PUMP.....	72
05AA.	Valves Flanges and Fittings.....	73
06AA.	FISH SCREENS	
15BA.	Fish Screens.....	73
07AA.	COFFERDAM	
20AA.	Sheetpile.....	73
08AA.	DEWATERING PUMPING	
15AA.	Dewater Pumping - 10000 gpm.....	74
09AA.	EXCAVATION (EARTH) INTAKE PIPE	
02EE.	EXCAVATE (EARTH).....	75
10AA.	EXCAVATION (ROCK) INTAKE PIPE	
02ER.	EXCAVATE (ROCK).....	75
11AA.	48" DIA INTAKE PIPE (STEEL)	
02MC.	48" DIA INTAKE PIPE (STEEL).....	76
12AA.	36" DIA PIPE CAISSON & MANIFOLD	
02MB.	36" DIA MANIFOLD (STEEL).....	77
13AA.	EXCAVATE FOR CAISSON & MANIFOLD	
02EX.	Excavate Caisson & Manifold.....	77
14AA.	BACKFILL FOR CAISSON & MANIFOLD	
02BA.	Backfill for Caisson & manifold.....	77
15AA.	42" DIA PIPE (STEEL)	
02MC.	42" DIA STEEL PIPE.....	77
16AA.	EXCAVATION-EARTH DISCHARGE PIPE	
02EE.	EXCAVATE (EARTH).....	78
02FE.	DISPOSAL.....	78
17AA.	PIPE BEDDING	
02BA.	Bedding Material.....	78
18AA.	BACKFILL FOR PIPE	
02BA.	Backfill.....	79
19AA.	EMBANKMENT FOR ACCESS ROAD	
02RD.	EMBANKMENT FOR ACCESS ROAD.....	79
20AA.	GRAVEL (ACCESS ROAD)	
02RA.	Access Road Sitework/Earthwork.....	79

DETAILED ESTIMATE

DETAIL PAGE

29.	WESTERN EMPIRE #2 PUMP STATION	
01AA.	MOB, DEMOB & PREPARATORY WORK.....	80
02AA.	200 HP PUMP	
60AA.	200 HP PUMP.....	80
03AA.	Valves Flanges and Fittings.....	81
04AA.	FISH SCREENS	
15BA.	Fish Screens.....	81
05AA.	COFFERDAM	
20AA.	Sheetpile.....	81
06AA.	DEWATERING PUMPING	
15AA.	Dewater Pumping - 10000 gpm.....	82
07AA.	EXCAVATION (EARTH) INTAKE PIPE	
02EE.	EXCAVATE (EARTH).....	83
08AA.	EXCAVATION (ROCK) INTAKE PIPE	
02ER.	EXCAVATE (ROCK).....	83
09AA.	48" DIA INTAKE PIPE (STEEL)	
02MC.	48" DIA INTAKE PIPE (STEEL).....	84
10AA.	36" DIA PIPE CAISSON & MANIFOLD	
02MB.	36" DIA MANIFOLD (STEEL).....	85
11AA.	EXCAVATE FOR CAISSON & MANIFOLD	
02EX.	Excavate Caisson & Manifold.....	85
12AA.	BACKFILL FOR CAISSON & MANIFOLD	
02BA.	Backfill for Caisson & manifold.....	85
13AA.	42" DIA PIPE (STEEL)	
02MC.	42" DIA STEEL PIPE.....	85
14AA.	EXCAVATION-EARTH DISCHARGE PIPE	
02EE.	EXCAVATE (EARTH).....	86
02FE.	DISPOSAL.....	86
15AA.	EXCAVATION (ROCK) DISCHARGE PIPE	
02ER.	EXCAVATE (ROCK).....	86
16AA.	PIPE BEDDING	
02BA.	Bedding Material.....	87
17AA.	BACKFILL FOR PIPE	
02BA.	Backfill.....	88
18AA.	CONCRETE WEIR BOX	
03CA.	Walls Structural Concrete.....	88
19AA.	CONCRETE PAD	
03DA.	Slabs Structural Concrete.....	89
20AA.	ELECTRICAL & MECHANICAL HOOKUPS	
15AA.	MECHANICAL HOOKUPS.....	89
16AA.	ELECTRICAL HOOKUPS.....	90
21AA.	ELECTRICAL UTILITIES	
16IA.	ELECTRICAL UTILITIES.....	90
22AA.	Right-Of-Way Acquisition.....	91
30.	WESTERN EMPIRE #1 PUMP STATION	
01AA.	MOB, DEMOB & PREPARATORY WORK.....	91
02AA.	FISH SCREENS	
15BA.	Fish Screens.....	91
03AA.	COFFERDAM	
20AA.	Sheetpile.....	91
04AA.	DEWATERING PUMPING	

DETAILED ESTIMATE	DETAIL PAGE
15AA. Dewater Pumping - 10000 gpm.....	92
05AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	93
06AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	93
07AA. 32" DIA INTAKE PIPE (STEEL)	
02MC. 32" DIA INTAKE PIPE (STEEL).....	94
08AA. 30" DIA PIPE CAISSON & MANIFOLD	
02MB. 30" DIA MANIFOLD (STEEL).....	95
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	95
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	95
31. WEST IRRIGATION DISTRICT #2	
01AA. MOB, DEMOB & PREPARATORY WORK.....	96
02AA. FISH SCREENS	
15BA. Fish Screens.....	96
03AA. COFFERDAM	
20AA. Sheetpile.....	96
04AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	97
05AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	98
06AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	98
07AA. 24" DIA INTAKE PIPE (STEEL)	
02MC. 24" DIA INTAKE PIPE (STEEL).....	99
08AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA MANIFOLD (STEEL).....	100
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	100
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	100
32. STREBIN FARMS PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	101
02AA. 150 HP PUMP	
60AA. 150 HP PUMP.....	101
03AA. Valves Flanges and Fittings.....	101
04AA. FISH SCREENS	
15BA. Fish Screens.....	101
05AA. COFFERDAM	
20AA. Sheetpile.....	101
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	102
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	103
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	104
09AA. 36" DIA INTAKE PIPE (STEEL)	
02MC. 36" DIA INTAKE PIPE (STEEL).....	105
10AA. 36" DIA PIPE CAISSON & MANIFOLD	

DETAILED ESTIMATE

DETAIL PAGE

02MB. 36" DIA MANIFOLD (STEEL).....105
11AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....105
12AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....105
13AA. 30" DIA PIPE (STEEL)
02MC. 30" DIA STEEL PIPE.....106
14AA. EXCAVATION-EARTH DISCHARGE PIPE
02EE. EXCAVATE (EARTH).....106
02FE. DISPOSAL.....106
15AA. PIPE BEDDING
02BA. Bedding Material.....107
16AA. BACKFILL FOR PIPE
02BA. Backfill.....107
17AA. CONCRETE WEIR BOX
03CA. Walls Structural Concrete.....107
18AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....108
19AA. ELECTRICAL & MECHANICAL HOOKUPS
15AA. MECHANICAL HOOKUPS.....109
16AA. ELECTRICAL HOOKUPS.....109
20AA. ELECTRICAL UTILITIES
16IA. ELECTRICAL UTILITIES.....109
21AA. Right-Of-Way Acquisition.....110
33. PERKINS FARMS PUMP STATION
01AA. MOB, DEMOB & PREPARATORY WORK.....110
02AA. FISH SCREENS
15BA. Fish Screens.....110
03AA. COFFERDAM
20AA. Sheetpile.....110
04AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....111
05AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....112
06AA. EXCAVATION (ROCK) INTAKE PIPE
02ER. EXCAVATE (ROCK).....112
07AA. 42" DIA INTAKE PIPE (STEEL)
02MC. 42" DIA INTAKE PIPE (STEEL).....114
08AA. 32" DIA PIPE CAISSON & MANIFOLD
02MB. 32" DIA MANIFOLD (STEEL).....114
09AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....114
10AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....114
34. C&B LIVESTOCK PUMP STATION
01AA. MOB, DEMOB & PREPARATORY WORK.....115
02AA. FISH SCREENS
15BA. Fish Screens.....115
03AA. COFFERDAM
20AA. Sheetpile.....115
04AA. DEWATERING PUMPING

DETAILED ESTIMATE	DETAIL PAGE
15AA. Dewater Pumping - 10000 gpm.....	116
05AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	117
06AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	117
07AA. 48" DIA INTAKE PIPE (STEEL)	
02MC. 48" DIA INTAKE PIPE (STEEL).....	118
08AA. 36" DIA PIPE CAISSON & MANIFOLD	
02MB. 36" DIA MANIFOLD (STEEL).....	119
09AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	119
10AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	119
35. LEONARD FARM PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	120
02AA. 100 HP PUMP	
60AA. 100 HP PUMP.....	120
03AA. Valves Flanges and Fittings.....	120
04AA. FISH SCREENS	
15BA. Fish Screens.....	120
05AA. COFFERDAM	
20AA. Sheetpile.....	120
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	121
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	122
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	123
09AA. 30" DIA INTAKE PIPE	
02MB. 30" DIA INTAKE PIPE.....	124
10AA. 30" DIA PIPE CAISSON & MANIFOLD	
02MB. 30" DIA CAISSON & MANIFOLD.....	124
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	124
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	124
13AA. 24" DIA PIPE (STEEL)	
02MC. 24" DIA STEEL PIPE.....	125
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	125
02FE. DISPOSAL.....	125
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	126
16AA. PIPE JACKING	
K02C. JACK/BORE PIPE, SMALL DIA.....	127
17AA. PIPE BEDDING	
02BA. Bedding Material.....	127
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	127
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	128

DETAILED ESTIMATE

DETAIL PAGE

20AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....128

21AA. ELECTRICAL & MECHANICAL HOOKUPS
15AA. MECHANICAL HOOKUPS.....129
16AA. ELECTRICAL HOOKUPS.....129

22AA. ELECTRICAL UTILITIES
61A . ELECTRICAL UTILITIES.....129

23AA. GRAVEL (ACCESS ROAD)
02RA. Access Road Sitework/Earthwork.....130

24AA. Right-Of-Way Acquisition.....131

36. WEST EXTENSION IRRIGATION

01AA. MOB, DEMOB & PREPARATORY WORK.....131

02AA. 200 HP PUMP
60AA. 200 HP PUMP.....131

03AA. Valves Flanges and Fittings.....131

04AA. FISH SCREENS
15BA. Fish Screens.....132

05AA. COFFERDAM
20AA. Sheetpile.....132

06AA. DEWATERING PUMPING
15AA. Dewater Pumping - 10000 gpm.....133

07AA. EXCAVATION (EARTH) INTAKE PIPE
02EE. EXCAVATE (EARTH).....134

08AA. EXCAVATION (ROCK) INTAKE PIPE
02ER. EXCAVATE (ROCK).....134

09AA. 48" DIA INTAKE PIPE
02MB. 48" DIA INTAKE PIPE.....135

10AA. 36" DIA PIPE CAISSON & MANIFOLD
02MB. 36" DIA PIPE CAISSON & MANIFOLD.....135

11AA. EXCAVATE FOR CAISSON & MANIFOLD
02EX. Excavate Caisson & Manifold.....136

12AA. BACKFILL FOR CAISSON & MANIFOLD
02BA. Backfill for Caisson & manifold.....136

13AA. 42" DIA PIPE (STEEL)
02MC. 42" DIA STEEL PIPE.....136

14AA. EXCAVATION-EARTH DISCHARGE PIPE
02EE. EXCAVATE (EARTH).....137
02FE. DISPOSAL.....137

15AA. EXCAVATION (ROCK) DISCHARGE PIPE
02ER. EXCAVATE (ROCK).....137

16AA. PIPE JACKING
K02C. Jack/Bore Pipe, Large DIA.....138

17AA. PIPE BEDDING
02BA. Bedding Material.....139

18AA. BACKFILL FOR PIPE
02BA. Backfill.....139

19AA. CONCRETE WEIR BOX
03CA. Walls Structural Concrete.....139

20AA. CONCRETE PAD
03DA. Slabs Structural Concrete.....140

21AA. ELECTRICAL & MECHANICAL HOOKUPS

DETAILED ESTIMATE	DETAIL PAGE
15AA. MECHANICAL HOOKUPS.....	141
16AA. ELECTRICAL HOOKUPS.....	141
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	141
23AA. Right-Of-Way Acquisition.....	142
37. UMATILLA HS PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	142
02AA. 25 HP PUMP	
60AA. 25 HP PUMP.....	142
03AA. Valves Flanges and Fittings.....	142
04AA. FISH SCREENS	
15BA. FISH SCREENS.....	142
05AA. COFFERDAM	
20AA. Sheetpile.....	143
06AA. DEWATERING PUMPING	
15AA. Dewater Pumping - 10000 gpm.....	144
07AA. EXCAVATION (EARTH) INTAKE PIPE	
02EE. EXCAVATE (EARTH).....	145
08AA. EXCAVATION (ROCK) INTAKE PIPE	
02ER. EXCAVATE (ROCK).....	145
09AA. 24" DIA INTAKE PIPE	
02MB. 24" DIA INTAKE PIPE.....	146
10AA. 24" DIA PIPE CAISSON & MANIFOLD	
02MB. 24" DIA CAISSON & MANIFOLD.....	146
11AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	146
12AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	147
13AA. 12" DIA PIPE (STEEL)	
02MC. 12" DIA STEEL PIPE.....	147
14AA. EXCAVATION-EARTH DISCHARGE PIPE	
02EE. EXCAVATE (EARTH).....	147
02FE. DISPOSAL.....	148
15AA. EXCAVATION (ROCK) DISCHARGE PIPE	
02ER. EXCAVATE (ROCK).....	148
16AA. PIPE JACKING	
K02C. Jack/Bore Pipe, Small Dia.....	149
17AA. PIPE BEDDING	
02BA. Bedding Material.....	149
18AA. BACKFILL FOR PIPE	
02BA. Backfill.....	150
19AA. CONCRETE WEIR BOX	
03CA. Walls Structural Concrete.....	150
20AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	151
21AA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	151
16AA. ELECTRICAL HOOKUPS.....	152
22AA. ELECTRICAL UTILITIES	
61A . ELECTRICAL UTILITIES.....	152
23AA. Right-Of-Way Acquisition.....	153

DETAILED ESTIMATE

DETAIL PAGE

BACKUP REPORTS

BACKUP PAGE

CREW BACKUP.....1
LABOR BACKUP.....8
EQUIPMENT BACKUP.....9

* * * END TABLE OF CONTENTS * * *

Attachment E. Total Project Cost Summary Alternative 1 – 4 Canal

(US Army Corps of Engineers, Portland District, 1999)

****TOTAL PROJECT COST SUMMARY****

THIS ESTIMATE IS BASED ON THE SCOPE OF WORK FOR THE JOHN DAY DRAWDOWN PHASE 1 REPORT

PROJECT: JOHN DAY DRAWDOWN - ALTERNATIVES 1, 2, 3 & 4 IRRIGATION CANALS

DISTRICT: PORTLAND

30-May-00

LOCATION: JOHN DAY DAM & RESERVOIR

P.O.C.: PAT JONES, CHIEF, COST ENGINEERING SECTION

CURRENT MCACES ESTIMATE PREPARED:					AUTHORIZ./BUDGET YEAR: 1999					FULLY FUNDED ESTIMATE				
EFFECTIVE PRICING LEVEL:					EFFECT. PRICING LEVEL: Oct 99									
ACCOUNT		COST	CNTG	CNTG	TOTAL	OMB	COST	CNTG	TOTAL	FEATURE	OMB	COST	CNTG	FULL
NUMBER	FEATURE DESCRIPTION	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	MID PT	(%)	(\$K)	(\$K)	(\$K)
JOHN DAY DAM AND RESERVOIR														
02- - -	RELOCATIONS													
OR.02- - -	IRRIGATION CANAL OREGON	111253	27,813	25%	139,067	3.3%	114,925	28,731	143,656	Apr-2006	23.1%	141,472	35,368	176,840
WA.02- - -	IRRIGATION CANAL WASHINGTON	122010	30,502	25%	152,512	3.3%	126,036	31,509	157,545	Apr-2006	23.1%	155,151	38,788	193,938
	TOTAL CONSTRUCTION COSTS =====>	233,263	58,316	25%	291,579	3.3%	240,961	60,240	301,201		23.1%	296,623	74,156	370,779
01- - -	LANDS AND DAMAGES	11,663	2,916	25%	14,579	3.3%	12,048	3,012	15,060	Apr-2006	23.1%	14,831	3,708	18,539
18- - -	CULTURAL RESOURCE PRESERVATION	2,332	584	25%	2,916	3.3%	2,409	603	3,012	Apr-2006	23.1%	2,966	742	3,708
30- - -	PLANNING, ENGINEERING AND DESIGN	47,836	11,959	25%	59,795	4.6%	50,036	12,509	62,545	Apr-2006	32.2%	66,147	16,537	82,684
31- - -	CONSTRUCTION MANAGEMENT	13,944	3,486	25%	17,430	4.6%	14,585	3,646	18,231	Apr-2006	32.2%	19,281	4,820	24,101
	TOTAL COST =====>	309,038	77,261	25%	386,299	3.6%	320,039	80,010	400,049		24.9%	399,848	99,963	499,811

NOTE: These costs are preliminary and are subject to change.

Mon 24 Jul 2000
Eff. Date 10/01/99

III-SERVICE Automated Cost Estimating System (MCCES)
PROJECT ORIG8: IRRIGATION CANALS OREGON Rev 1 - JOHN DAY DRAWDOWN
IRRIGATION CANAL OREGON Rev 1

TITLE PAGE

IRRIGATION CANALS OREGON Rev 1
JOHN DAY DRAWDOWN
CURRENT WORKING ESTIMATE
Effective Price Level 1 OCT 99
--- FOR OFFICIAL USE ONLY ---

Designed By: NWW Engineering Division
Estimated By: John Skarbek

Prepared By: NWW-C, Cost Engineering Branch
Kim Callan, P.E., Branch Chief

Preparation Date: 05/30/00
Effective Date of Pricing: 10/01/99
Est Construction Time: 400 Days

Sales Tax: 0.00%

This report is not copyrighted, but the information
contained herein is For Official Use Only.

M C A C E S F O R W I N D O W S
Software Copyright (c) 1985-1998
by Building Systems Design, Inc.
Release 1.2c

LABOR ID: OR99M2 EQUIP ID: NAT97C

Currency in DOLLARS

CREW ID: NAT99A UPB ID: UP95

**** BASIS OF ESTIMATE** This estimate consists of costs to construct an irrigation canal system to provide water to the existing privately owned and operated pump stations along the Columbia River in Oregon affected by the John Day Dam drawdown. This revision contains corrections to the cofferdams.

**** PROJECT DESCRIPTION**

This estimate consists of costs to construct a canal from the McNary pool above McNary Dam near Umatilla, Oregon to Six Mile Canyon west of Boardman, Oregon. This canal is one of the alternatives being looked at to provide water to all of the farms in Umatilla, Morrow and Gilliam Counties that would be impacted by the lowering of the pool elevation caused by the drawdown of the John Day reservoir. The work consists of: Constructing a canal, installing a pump station to provide water to the canal and moving the existing pump stations up to the canal.

**** BASIS OF DESIGN** The work required, was established by Portland District and this estimate was prepared using those assumptions, tasks and quantities provided.

CONSTRUCTION SCHEDULE The approximate construction schedule is as follows:
Award Contracts September 2000
Construction Complete January 2003
Drawdown of Reservoir commences February 2003

CONSTRUCTION WINDOWS It is assumed that in water work for this project can only be accomplished during the normal in water work windows. This window occurs yearly and work is allowed during the months of December, January and February. The only work which will be impacted by this window is the installation of the intake pipes. All work will have to be completed before the drawdown commences.

OVERTIME This estimate does not contain any overtime.

ACQUISITION PLAN It is assumed that the private irrigators will contract the work out.

SUB-CONTRACTING PLAN The following are subcontractors on this project:
Mechanical Subcontractor (ME)
Electrical Subcontractor (EL)

PROJECT CONSTRUCTION SITE ACCESS The project site is located in Oregon from McNary Dam to Six Mile Canyon. Site access is from existing federal, state and local roads.

BORROW AREAS It is assumed that most fill material can be obtained on site. Bedding material will be purchased from a supplier and riprap will be acquired from the quarry at Arlington, Oregon and barged to the area where it is required.

CONSTRUCTION METHODOLOGY The construction methodology is standard.
UNUSUAL CONDITION

No unusual conditions are anticipated.

UNIQUE TECHNIQUES OF CONSTRUCTION There are no unique techniques of construction.

EQUIPMENT AND LABOR AVAILABILITY & DISTANCE TRAVELED It is assumed that labor and equipment are available in the States of Oregon and Washington.

ENVIRONMENTAL CONCERNS No environmental concerns are anticipated.
EQUIPMENT AND LABOR RATES

This estimate uses Davis Bacon labor rates for Umatilla County, Washington, OR990017, Modification No 2 dated 4/02/99.

Equipment rates used are from EP 1110-1-8, Volume 8, September 1997. Material prices were obtained from quotes, internet sources, pricing guides, supply catalogs, historical data (escalated to FY 1999), and the MCACES National Unit Price Book UP99EB.

No sales tax has been applied.

The effective price level is 1 October 1998 (FY 1999)

SUMMARY REPORTS	SUMMARY PAGE
PROJECT INDIRECT SUMMARY - FEATURE.....	1
PROJECT INDIRECT SUMMARY - BID ITEM.....	2
PROJECT INDIRECT SUMMARY - CSI ITEM.....	5
PROJECT DIRECT SUMMARY - FEATURE.....	20
PROJECT DIRECT SUMMARY - BID ITEM.....	21
PROJECT DIRECT SUMMARY - CSI ITEM.....	25

DETAILED ESTIMATE	DETAIL PAGE
OR. IRRIGATION CANAL OR	
02. RELOCATIONS	
20. CANALS	
01. MCNARY PUMP STATION	
01AA. MOB, DEMOB & PREPARATORY WORK.....	1
02AA. 1500 HP PUMPS	
60AA. 1500 HP PUMPS.....	1
03AA. Valves Flanges and Fittings.....	1
04AA. FISH SCREENS	
15BA. Fish Screens.....	1
05AA. 15' STEEL SHEET PILING	
20AA. Sheetpile.....	1
06AA. 6'DIA INTAKE PIPE	
02AJ. 6' Diameter Intake Pipe (steel).....	3
07AA. 6'DIA PUMP CAISSON & DISCHARGE	
02AJ. 6'dia Caisson & Manifold.....	3
08AA. EXCAVATE CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	4
09AA. BACKFILL CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	4
10AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	4
11AA. RIPRAP	
02RA. Riprap, Production.....	5
02RB. Riprap, Load Barge & Stockpile.....	11
02RC. Place By Clamshell in water.....	11
02RD. Place In Dry Above Water.....	11
12AA. ELECTRICAL AND MECHANICAL	
15AA. MECHANICAL HOOKUPS.....	11
16AA. ELECTRICAL HOOKUPS.....	12
13AA. METAL SWITHEGEAR BUILDING	
13AA. Utility Building.....	12
02. MCNARY PENSTOCK TO CANAL	
01AA. MOB, DEMOB & PREPARATORY WORK.....	13
02AA. 60" STEEL PIPE PENSTOCK	
02AK. 60" Steel Pipe (penstock).....	13
04AA. EXCAVATION & BACKFILL (ROCK)	
02ER. EXCAVATE (ROCK).....	13
02FE. BACKFILL (EARTH).....	14
05AA. PIPE JACKING UNDER RAILROAD	
K02C. JACK/BORE PIPE, LARGE DIA.....	15

DETAILED ESTIMATE

DETAIL PAGE

06AA. MISCELLANEOUS FITTINGS.....	15
03. UMATILLA RIVER RAILROAD AND	
01AA. MOB, DEMOB & PREPARATORY WORK.....	15
02AA. 60" STEEL PIPE PENSTOCK	
02AK. 60" Steel Pipe (penstock).....	15
03AA. EXCAVATION & BACKFILL (EARTH)	
02EE. EXCAVATE (EARTH).....	15
02FE. BACKFILL (EARTH).....	16
04AA. EXCAVATION & BACKFILL (ROCK)	
02ER. EXCAVATE (ROCK).....	16
02FE. BACKFILL (EARTH).....	17
05AA. PIPE JACKING UNDER RAILROAD	
K02C. JACK/BORE PIPE, LARGE DIA.....	18
05CA. PIPE JACKING UNDER ROADWAYS	
K02C. JACK/BORE PIPE, LARGE DIA.....	18
06AA. MISCELLANEOUS FITTINGS.....	18
04. OREGON CANAL	
01AA. MOB, DEMOB & PREPARATORY WORK.....	18
02AA. EXCAVATION	
02EE. Excavation.....	19
03AA. FILL	
02BF. FILL.....	19
04AA. CONCRETE LINING	
02CG. Pad Subgrade Preparation.....	19
02CP. Inclined Slab On Grade, 3"Tk 4KSI.....	20
05AA. TRIM & CONCRETE CRACK CONTROL.....	20
06AA. SECURITY FENCE	
02FE. Fence Galv, Posts Set in Earth.....	20
02SN. Signs.....	21
07AA. BRIDGES	
02RA. Temporary detour.....	22
03FA. Bridge Deck, Forms.....	22
03FB. Bridge Deck, Rebar.....	22
03FC. Bridge Deck, Pour & Cure Conc.....	23
03GA. Bush Hammer Finish.....	23
03JA. Precast I Beam, Typ I, 1'4"X 2'4"D.....	23
03MA. Column Footing, Forms, 4 Uses.....	23
03MB. Column Footing, Rebar.....	23
03MC. Column Footing, Pour&CureConc.....	24
03NA. Columns, Forms, Fiber, 24" Round.....	24
03NB. Columns, Rebar, Spiral.....	24
03NC. Columns, Pour & Finish Concrete.....	24
03QA. Parapet, Form.....	25
03QB. Parapet, Rebar.....	25
03QC. Parapet, Pour & Cure.....	25
03WA. Wall, Form.....	25
03WB. Wall, Rebar.....	25
03WC. Wall, Pour & Cure.....	26
03WD. Ret Wall Footing, Forms, 4 Uses.....	26
03WE. Ret Wall Footing, Rebar.....	26
03WF. Ret Wall Footing, Pour&CureConc.....	26

DETAILED ESTIMATE

DETAIL PAGE

03XX. Misc - exp jts, bearing pl8, etc.....	26
08A-. CANAL CHECK STRUCTURE (Title).....	27
08AA. MOB & DEMOB.....	27
08BA. WALKWAY	
05AA. WALKWAY.....	27
08CA. HANDRAIL	
05HR. HANDRAIL.....	27
08DA. TRENCH EXCAVATION	
02EE. Excavation.....	28
08EA. COMPACTED BACKFILL	
02BF. FILL.....	28
08FA. REINFORCEMENT - REBAR	
05AA. REINFORCEMENT - REBAR.....	28
08GA. CONCRETE	
02CG. Pad Subgrade Preparation.....	29
02CP. Inclined Slab On Grade, 3"Tk 4KSI.....	29
08HA. GATE (60"X36")	
05GA. GATE (60"X36").....	29
08. IRRIGATION PUMPING STATIONS	
01AA. MOB, DEMOB & PREPARATORY WORK.....	30
02AA. TRASHRACKS 3' x 3'	
05TR. TRASHRACKS 3' x 3'.....	30
03AA. TRASHRACKS 4' x 4'	
05TR. TRASHRACKS 4' x 4'.....	30
04AA. 24" DIA INTAKE PIPE (STEEL)	
02AJ. 24" Diameter Steel Pipe.....	30
05AA. 30" DIA INTAKE PIPE (STEEL)	
02AK. 30" Steel Pipe.....	31
06AA. 24" DIA CAISSON (STEEL)	
02AJ. 24" Diameter Steel Pipe.....	31
07AA. 30" DIA CAISSON (STEEL)	
02AK. 30" Steel Pipe.....	31
08AA. 18" DIA MANIFOLD (STEEL)	
02MA. 18" DIA MANIFOLD (STEEL).....	31
09AA. 24" DIA MANIFOLD (STEEL)	
02AJ. 24" Diameter Steel Pipe.....	32
10AA. 36" DIA MANIFOLD (STEEL)	
02MB. 36" DIA MANIFOLD (STEEL).....	32
11AA. 48" DIA MANIFOLD (STEEL)	
02MC. 48" DIA MANIFOLD (STEEL).....	32
12AA. 60" DIA MANIFOLD (STEEL)	
02AP. 60" Steel Pipe.....	32
13AA. 72" DIA MANIFOLD (STEEL)	
02MG. 72" DIA MANIFOLD (STEEL).....	33
14AA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	33
15AA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	33
16AA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	34
17AA. ELECTRICAL & MECHANICAL HOOKUPS	

DETAILED ESTIMATE	DETAIL PAGE
15AA. MECHANICAL HOOKUPS.....	34
16AA. ELECTRICAL HOOKUPS.....	35
18A-- REMOVE, REBOWL & REINSTALL.....	35
18AA. 25 HP PUMP - MAINTENANCE	
15AA. 25 HP PUMP - MAINTENANCE.....	35
18BA. 125 HP PUMP - MAINTENANCE	
15AA. 125 HP PUMP - MAINTENANCE.....	35
18CA. 200 HP PUMP - MAINTENANCE	
15AA. 200 HP PUMP - MAINTENANCE.....	35
18DA. 300 HP PUMP - MAINTENANCE	
15AA. 300 HP PUMP - MAINTENANCE.....	36
18EA. 400 HP PUMP - MAINTENANCE	
15AA. 400 HP PUMP - MAINTENANCE.....	36
18EK. 500 HP PUMP - MAINTENANCE	
15AA. 500 HP PUMP - MAINTENANCE.....	36
18FA. 600 HP PUMP - MAINTENANCE	
15AA. 600 HP PUMP - MAINTENANCE.....	37
18GA. 700 HP PUMP - MAINTENANCE	
15AA. 700 HP PUMP - MAINTENANCE.....	37
18HA. 800 HP PUMP - MAINTENANCE	
15AA. 800 HP PUMP - MAINTENANCE.....	37
18IA. 1000 HP PUMP - MAINTENANCE	
15AA. 1000 HP PUMP - MAINTENANCE.....	37
18KA. 1250 HP PUMP - MAINTENANCE	
15AA. 1250 HP PUMP - MAINTENANCE.....	38
19AA. 8" PRESSURE RELIEF VALVE	
15PV. 8" PRESSURE RELIEF VALVE.....	38
20AA. 12" PRESSURE RELIEF VALVE	
15PV. 12" PRESSURE RELIEF VALVE.....	38
21AA. 16" PUMP CHECK VALVE & PIPING	
15CV. 16" PUMP CHECK VALVE & PIPING.....	38
22AA. 24" PUMP CHECK VALVE & PIPING	
15CV. 24" PUMP CHECK VALVE & PIPING.....	39
23AA. 24" PUMP CHECK VALVE & PIPING	
15CV. 24" PUMP CHECK VALVE & PIPING.....	39
24-- BOARDMAN REST AREA PUMP.....	39
24AA. PIPE TRENCH EXCAVATION	
02EX. Pipe Trench Excavation.....	39
24BA. 8" DIA PIPE (corrugated metal)	
05CM. 8" DIA PIPE (corrugated metal).....	40
24CA. BEDDING MATERIAL	
02BA. Bedding Material.....	40
24DA. BACKFILL (FROM EXCAVATION)	
02BA. Backfill.....	40
24EA. PIPE JACKING UNDER I-84	
02KC. JACK/BORE PIPE, MEDIUM DIA.....	41
10. REGULATING RESERVOIRS	
01AA. MOB, DEMOB & PREPARATORY WORK.....	41
02AA. EARTH FILL	
02BF. FILL.....	41
03AA. CONCRETE SPILLWAY	

DETAILED ESTIMATE	DETAIL PAGE
02CG. Pad Subgrade Preparation.....	41
02CP. Inclined Slab On Grade,3"Tk 4KSI.....	42
04--- RELIFT STATION.....	42
04AA. TRASHRACKS 3' x 3'	
05TR. TRASHRACKS 3' x 3'.....	42
04BA. 24" DIA INTAKE PIPE (STEEL)	
02AJ. 24" Diameter Steel Pipe.....	43
04CA. 24" DIA CAISSON & MANIFOLD-STEEL	
02AJ. 24" Diameter Steel Pipe.....	43
04DA. EXCAVATE FOR CAISSON & MANIFOLD	
02EX. Excavate Caisson & Manifold.....	43
04EA. BACKFILL FOR CAISSON & MANIFOLD	
02BA. Backfill for Caisson & manifold.....	43
04FA. CONCRETE PAD	
03DA. Slabs Structural Concrete.....	44
04GA. 70 HP PUMP	
15AA. 70 HP PUMP - MAINTENANCE.....	45
04HA. ELECTRICAL & MECHANICAL HOOKUPS	
15AA. MECHANICAL HOOKUPS.....	45
16AA. ELECTRICAL HOOKUPS.....	45
04IA. 12" PRESSURE RELIEF VALVE	
15PV. 12" PRESSURE RELIEF VALVE.....	45
04JB. 24" PUMP CHECK VALVE & PIPING	
15CV. 24" PUMP CHECK VALVE & PIPING.....	46
05AA. RIPRAP	
02RA. Riprap, Production.....	46
02RB. Riprap, Load Barge & Stockpile.....	52
02RC. Place By Clamshell in water.....	52
02RD. Place In Dry Above Water.....	52
06AA. METAL SWITHGEAR BUILDING	
13AA. Utility Building.....	52
20. VARIOUS LOCATIONS	
01AA. MOB, DEMOB & PREPARATORY WORK.....	53
60AA. AUTOMATION AND CONTROL SYSTEMS	
16AA. McNary Pump Station.....	54
16CA. Field Stations (70).....	54
60DA. RESTORE ORIGINAL PUMP STATION	
02RS. RESTORE ORIGINAL PUMP STATION.....	54
60HA. RELOCATE ELECTRICAL UTILITIES	
16AA. McNary Pump Station Substation.....	54
16CA. Irrigation Station No. 1.....	55
16DA. Irrigation Station No. 2.....	55
16EA. Irrigation Station No. 3.....	56
16FA. Irrigation Station No. 5.....	57
16GA. Irrigation Station No. 7.....	58
16HA. Irrigation Station No. 8.....	59
16IA. Irrigation Station No. 9.....	60
16JA. Irrigation Station No. 10.....	60
90AA. RIGHT-OF-WAY ACQUISITION.....	61

BACKUP REPORTS	BACKUP PAGE
CREW BACKUP.....	1
LABOR BACKUP.....	16
EQUIPMENT BACKUP.....	17

* * * END TABLE OF CONTENTS * * *

	QUANTITY	UOM	TOTAL DIRECT	FOOH	HOOH	PROF	OTHR TAX	BOND	TOTAL COST	UNIT
OR IRRIGATION CANAL OR										
OR.02 RELOCATIONS	1.00	EA	93,242,419	7,459,394	3,524,563	6,253,583	0	773,360	111,253,318	111
TOTAL IRRIGATION CANAL OR			93,242,419	7,459,394	3,524,563	6,253,583	0	773,360	111,253,318	
TOTAL IRRIGATION CANALS OREGON Rev 1			93,242,419	7,459,394	3,524,563	6,253,583	0	773,360	111,253,318	