

Project Title: Lower Granite Juvenile Fish Facility System Upgrade

Dam and Reservoir Project: Lower Granite

Estimated Total Cost: greater than \$12 million, with a recent expansion of more than \$1 million to the total project estimated cost

Estimated Schedule for Completion of the Project: See p. 15-17 of the Project Management Plan (attached) for current estimated schedule

Current Status as of 6/8/2017: In construction

Summary

The Lower Granite Juvenile Fish Facility System Upgrade is a replacement of most of the previously utilized bypass system. The features that will be upgraded are expected to increase fish survival by providing more efficient control of flow, improving the removal and passage of debris, increasing attraction flow for juvenile fish, and reducing risk of predation at the outfall release point in the tailrace. The improvements realized from construction of this project are intended to help meet NOAA's 2008 Biological Opinion, as amended in 2010 and 2014, juvenile fish performance standards of 96% average dam passage survival for spring migrants and 93% average dam passage survival for summer migrants.

Due to recent necessary modifications to the contract terms due to delays in the construction schedule, the total estimated project cost has increased by more than \$1 million.

Project Management Plan

Organization: NWW

Program : Civil Works

Project Title : LLA Juv Fish Facility Sys Upgrade - Ph 1

PMP Status: ACTIVE

Project/P2 No. : 372857

Location: Lower Granite Lock & Dam

PM Name: Fichera, Thomas

PMP Date: 01/09/2012

Revision: 0

Revision Date:

Program Type: Civil Works

Funding Type: CRFM

Risk Level: MODERATE

Scope Summary:

This project will construct Phase 1 per the EDR supplement. This consists of the upper facility changes to the transportation channel, primary dewatering, emergency bypass, surplus water; intermediate facilities transportation flume, water supply, fish facilities bypass; and lower facilities flume and water supply to existing facilities. Projects options include collection channel orifice enlargement and weirs, PIT tag detection, surplus water to adult attraction, supplemental water to adult fish trap, and extend existing outfall.

Once constructed, biological testing and evaluation will be accomplished to determine its relative performance improvement.

PMP Acceptance Sheet

Approve

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| _____ | _____ | 01/03/2013 |
| Project Manager | | Date |
| _____ | _____ | 02/04/2013 |
| Program Manager | | Date |
| _____ | _____ | 02/22/2013 |
| PMP Approver | | Date |

Endorse

| | | |
|-----------------------|-------|------------|
| _____ | _____ | _____ |
| Chief, Structural POA | | Date |
| _____ | _____ | 01/22/2013 |
| Chief, Mechanical | | Date |
| _____ | _____ | 01/14/2013 |
| Chief EC | | Date |

Comment: Pending environmental milestone in schedule.

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| _____ | _____ | 01/22/2013 |
| Geotech/civil | | Date |
| Comment: | Added Dam Safety requirements for review to ensure project is not a Dam Safety Mod. | |

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| _____ | _____ | 01/24/2013 |
| Chief, Gen Engr | | Date |
| _____ | _____ | 01/18/2013 |
| Chief, Design Branch | | Date |

Comment: Need to revise dates for P&S Complete from 2015 to 2014. I talked with Stan and he indicated that that is in the works.

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| _____ | _____ | 01/24/2013 |
| Chief, Cost Engr | | Date |
| Comment: | Work window and construction restrictions need to be identified early in project to develop and accurate cost and schedule | |

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| _____ | _____ | 01/25/2013 |
| Resident construction engr | | Date |
| Comment: | No significant involvement planned for FY 13. Per PM, \$5K earmarked for reviews in FY 13. | |

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| _____ | _____ | 02/12/2013 |
| Chief, Granite OM | | Date |
| Comment: | Contingency planning to be incorporated in the event mining extends beyond one season | |

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| _____ | _____ | 01/16/2013 |
| Chief NRM | | Date |

Comment: It is critical that all reviews of this project include the Environmental Compliance Coordinator at Lower Granite Dam and the District Environmental Compliance Coordinator to ensure hazardous wastes etc are properly being considered in design and in construction.

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| [REDACTED] | [REDACTED] | 02/12/2013 |
| Chief Hyd Des | | Date |
| [REDACTED] | [REDACTED] | 12/31/2012 |
| Contracting officer | | Date |
| [REDACTED] | [REDACTED] | 01/30/2013 |
| Cultural | | Date |
| [REDACTED] | [REDACTED] | 01/08/2013 |
| Chief Electrical | | Date |
| [REDACTED] | [REDACTED] | 01/08/2013 |
| Chief EA | | Date |

Tech Lead

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| [REDACTED] | [REDACTED] | 01/30/2013 |
| Tech lead 60% design | | Date |

Comment: -Schedule requires update.
 -Risk table requires evaluation & additional information.
 -Determination of VE requirement still needed despite indication VE is necessary.
 -Continued refinement and development of SOW is underway.

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| [REDACTED] | [REDACTED] | |
| Tech lead | | Date |

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| [REDACTED] | [REDACTED] | |
| structural design | | Date |
| [REDACTED] | [REDACTED] | |
| mechanical | | Date |
| [REDACTED] | [REDACTED] | 01/11/2013 |
| Ops Biologist | | Date |
| [REDACTED] | [REDACTED] | 12/11/2012 |
| Geotech | | Date |
| [REDACTED] | [REDACTED] | 01/09/2013 |
| Environmental Compliance | | Date |
| [REDACTED] | [REDACTED] | |
| Lower plugs EC | | Date |
| [REDACTED] | [REDACTED] | 01/17/2013 |
| Hydraulics | | Date |
| [REDACTED] | [REDACTED] | 01/18/2013 |
| Struct EDR supplement | | Date |
| [REDACTED] | [REDACTED] | |
| structural | | Date |

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| [REDACTED] | [REDACTED] | 01/11/2013 |
| Hydraulic Design | | Date |
| [REDACTED] | [REDACTED] | 02/21/2013 |
| Project ops | | Date |
| <p>Comment: I am endorsing under the assurances that a more thorough and realistic construction schedule is under development by the PDT. I also think some more time needs to be put into the Risk Analysis by the entire PDT. There are also some significant structural design questions that need addressing.</p> | | |
| [REDACTED] | [REDACTED] | 01/09/2013 |
| Mechanical | | Date |
| [REDACTED] | [REDACTED] | 01/24/2013 |
| Geotech/Civil | | Date |
| [REDACTED] | [REDACTED] | |
| structural design | | Date |
| [REDACTED] | [REDACTED] | 01/31/2013 |
| cultural | | Date |
| [REDACTED] | [REDACTED] | 01/15/2013 |
| Fish Operations | | Date |
| [REDACTED] | [REDACTED] | |
| Cost - Fish screen slot closure | | Date |
| [REDACTED] | [REDACTED] | |
| LLA Fish operations | | Date |
| [REDACTED] | [REDACTED] | |
| Phase 1b contract | | Date |
| [REDACTED] | [REDACTED] | |
| cost engr | | Date |
| [REDACTED] | [REDACTED] | 01/11/2013 |
| Structural Design | | Date |
| [REDACTED] | [REDACTED] | |
| new safety officer | | Date |
| [REDACTED] | [REDACTED] | 01/10/2013 |
| biologist | | Date |
| [REDACTED] | [REDACTED] | 01/11/2013 |
| CT specialist | | Date |
| [REDACTED] | [REDACTED] | 01/11/2013 |
| electrical design | | Date |
| [REDACTED] | [REDACTED] | |
| cost engr | | Date |
| [REDACTED] | [REDACTED] | |
| structural | | Date |
| [REDACTED] | [REDACTED] | 01/15/2013 |
| Mech EDR supplement | | Date |
| [REDACTED] | [REDACTED] | 01/03/2013 |
| Specifications | | Date |

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| service contract geo tech | | 01/17/2013 |
| [REDACTED] | [REDACTED] | Date |
| Hydraulic Design | | 01/10/2013 |
| [REDACTED] | [REDACTED] | Date |
| Hydraulic design | | 01/09/2013 |
| [REDACTED] | [REDACTED] | Date |
| Mechanical Design | | |
| [REDACTED] | [REDACTED] | Date |
| EC Phase 1b | | 01/14/2013 |
| [REDACTED] | [REDACTED] | Date |
| Fish Biologist | | |
| [REDACTED] | [REDACTED] | Date |
| task order | | |
| [REDACTED] | [REDACTED] | Date |
| Structural | | 02/21/2013 |
| [REDACTED] | [REDACTED] | Date |
| Project ops | | 01/14/2013 |
| [REDACTED] | [REDACTED] | Date |
| biological monitoring | | 01/11/2013 |
| [REDACTED] | [REDACTED] | Date |
| Safety Officer | | |

Comment: I would like to review the Risk Management Matrix and expected risks with PM for discussion of assumptions of hazards made. More comments as we enter the Dr Checks phase

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| | | Date |
| | | Date |

Attached Documents

- 4.0 **Work Breakdown**
Phase 1 WBS from P2.pdf
- 5.0 **Funding/Resources**
Elec_564_LLA JFF Phase 1 P&S.pdf
LLA JFF Phase 1 Geotech.pdf
LLA JFF Phase 1 Civil Design.pdf
Mech LLA JFF PH1 FY13.pdf

Lower Granite JFF Upgrade FY13 P&S Form 2101 H-H 15May12.xls

Resource reportview.pdf

564_LGR_JBS_P&S_FY13 Env Analysis.xls

564- Structural Ph1 FY 13.pdf

ERDC P2-Resource-Budget.pdf

Gen Engr 564_372857- FY13 Only-12Sept12.pdf

6.0 Schedule Milestones

Schedule_23Oct13.pdf

Schedule_draft_23Oct13.mpp

LLA Phase 1 construction sched (simplified) Rev E.xlsx

7.0 Quality Control/Objectives

ATR review plan signed NWD memo.pdf

Risk Informed Review Selection Phase 1 rev A.pdf

8.0 Acquisition Strategy

Task Worksheet LLA JFF Upgrade Phase 1 revA signed.pdf

9.0 Risk Analysis

LLA JFF Upgrade Phase 1 Risk Management Matrix.xlsx

Fish Transport Pipe Closed Circuit Television (CCTV) signed.pdf

11.0 Change Management

PCR weir descope from phase 1a.pdf

13.0 Value Management

VE Screen-StrategyComboVMP_B0 14 3_Wagner Horn LLA Juv Fish Facility.pdf

LGR JFF Mods_VE STUDY REPORT_FINAL.pdf

1.0 General Scope

Background: NWW prepared an Engineering Design Report in 2010 entitled LOWER GRANITE LOCK AND DAM Snake River Juvenile Fish Facility Upgrade. This document analyzes potential for JFF improvements.

EDR supplement (2012) describes the Phase 1 and Phase 2 scopes of work that phases construction for the JBS system upgrade. The supplement is located at:

V:\Construction General\CRFM - LLA Juvenile Bypass System Upgrade\FY-12 EDR supplement
Filename: LGR JFF EDR Addendum Outline and Cost Summary
and is not yet completed.

Project components:

JFF collection channel mining to increase width from 6' to 9.5', overflow weirs (16), enlarged 14 inch orifice (16)

Transportation channel mining, 72" channel with steel reinforcing in some areas where the walls or slab gets thin.

14 inch orifice valve to replace 1 of 2 existing 10 inch orifices in each slot (16 total - 2 already replaced by prototype weir project)

Construct floor slab over the existing downwell.

Exterior elevated painted steel fish transport channel.

New elevated concrete dewatering unit.

Excess water is diverted to new buried piping and valves for Adult fish ladder Attraction, and Emergency Fish Bypass that outfalls to the river, probably requiring new pier supports or river bottom bracing. Attach emergency bypass pipe to existing fish pipe.

Elevated 36 inch corrugated metal flume, with walkway and handrail with in span support by steel truss at fishladder crossing and by 48 inch water supply pipe elsewhere.

Elevated PIT tag system (3 aluminum antennae enclosures, fiberglass corrugated pipe; electrical power and fiber optic wire)

Elevated flume loop with structural support on Transport Flume.

Elevated Flume Switchgate (to primary by-pass).

Side dewatering (secondary) unit to regulate flow to the existing facility dewater screens,

Concrete flume transition entrance;

Primary By-pass requiring 2 elevated corrugated flume loops with structural support which transitions to smooth buried pipe with access hatches that continues to the river outfall (inriver pier supports and footings) with a water cannon (pump and piping).

Tie-in of new flume system to existing separator

48 inch pipe from primary dewatering to existing fish transport pipe to utilize existing upwell for facility water supply. This connection will need to be downstream of where emergency bypass goes to river.

During early design of Phase 1, it was determined that the outfall location is likely on a later schedule track due to physical model (ERDC) construction schedule and geotech inwater survey constraint during the inwater work window. Therefore the Phase 1 effort may be further phased into 1A (Upper/intermediate facilities and interim outfall) and 1B (primary bypass and outfall).

If locating the outfall pipe necessitates delaying the schedule for acquiring geotechnical data for the in-river pier supports which subsequently delays the Outfall design completion date, the Outfall effort (smooth pipe section and water cannon) may be phased as a separate contract (phase 1B) that is awarded later but completes at the same time as this contract (phase 1A).

Phase 1B scope:

Design bypass outfall starting from Phase 1a interface at Col 51/elevation 659.0 continuing 36 inch corrugated flume to 53 feet beyond shoreline at 4.11% slope and then transitioning to smooth pipe running 600 feet at 1% slope to outfall location at WSP NAD27 coordinates x= 2,769,613.00, y= 499,430.00 (el 640.5). Structural support of 36 steel bypass pipe assumes 11 to 12 single in water piers. Design will

include routing and inter-tie connections of (4) JFF fish discharges ranging from 4 to 12 pipe diameter. Design includes bird deterrent sprinkler system with water source from primary dewatering unit, improved east facility flush water supply, and navigation lighting. Alternatives would consider walkway and pier spacing.

Collection channel weirs were at one time being considered as an optional item. Due to construction schedule concerns, and unknown biological benefit/evaluation, these have been deferred to a later effort (project -1C?)

Project Stakeholders: Regional Federal Columbia River Power System System Configuration Team, and Operations Division

1.1 Project Tasks

Construction Branch

Review technical and contract docs. Perform contract QA and administration for construction contract efforts. Coordinate with the PDT, safety office & Lower Granite Ops during construction.

Cost Branch

Prepare budget estimates at 90% and BCOE levels of design. Prepare Independent Govt Estimate (IGE) for use by the Contracting Officer. Participate in 60%, 90% and BCOE reviews.

Update budget estimate based on IGE and contract award for prototype weirs.

Compare cost estimate for strengthening of upstream collection channel wall using a) rebar and drilling and b) structural members in upstream fish slot.

Prepare cost estimate for additional cost of phased construction (flume loops and flume to new facility would be different if flume did not have to connect to existing facility and exit from facility were not connected to new outfall piping).

Electrical

Provide design services (drawings and technical specifications) for electrical items. Prepare plans and specifications to complete the electrical portions of the LLA JFF Phase 1 Upgrade. Provide a way to easily integrate back-up diesel generator and place a UPS on the PIT Tag computers. There is expected to be the following loads: power and control for the switchgate, any added automatic valve controls, PIT tag system, and exterior lighting on the outfall pipe (1b). The primary dewaterer is expected to be fed from the visitor's center or the powerhouse. Also, if a water cannon system is required (1b), additional power and controls for the system. Provide reviews of 60, 90 and BCOE levels of design packages. Provide responses to Vendor inquiries during the bidding process. Provide responses to contractor RFIs during the construction phase. Provide EDC and S&A services.

General Engineering-Specifications

Prepare technical specifications for construction contract. Participate in 60%, 90% and BCOE reviews. Coordinate with Contracting Specialist and Contracting Officer in development of the final contract bid package. Set up DR. CHECK reviews for District Quality Control reviews. Coordinate responses to Bidder Inquiries during the solicitation process. Assist and coordinate any necessary specification changes as a result of contract amendments during the advertisement period and any contract modifications following contract award.

COR/tech analysis for Scope of work for AE task for structural design (and P&S) inside the dam.

Geotechnical

Geotechnical

Provide geotechnical design and analyses services for planning and design stages to include:

- * revise PMP/564/schedule
- * develop & execute exploration programs (on-land and in-water)
- * develop subsurface profile
- * revise GDR & draft GDM
- * analyze foundations, deep & shallow, lateral & vertical loadings(on-land and in-water)
- * provide soil values to Structural Engineer and support development of foundation/footing design
- * ensure CAD drawings prepared
- * draft foundation & earthwork specs
- * perform 30, 60, 90, BCOE reviews

Provide construction support services to include:

- * submittal review
- * RFI evaluation
- * on-site drilled shaft inspection support (many hours!)
- * change order processing

Provide close out services:

- * organize/compile/file analyses
- * ensure explorations are plotted and logged

Civil

Provide civil design services for planning and design phases. Tasks include:

- * revise PMP/564/schedule
- * develop alignment
- * Provide site survey and utility locates
- * develop site plan
- * provide guidance on better possible alignment option during planning
- * develop utility relocate plans; address grading, asphalt and/or concrete repair
- * perform 30, 60, 90, BCOE reviews

Provide construction support services to include:

- * submittal review
- * RFI evaluation
- * change order processing

Provide close out services:

- * organize/compile/file analyses

Materials

Provide material design services for design phase. Tasks include:

- * revise PMP/564/schedule
- * draft concrete spec
- * draft pipe (HDPE?) spec
- * perform 30, 60, 90, BCOE reviews

Provide construction support services to include:

- * submittal review
- * RFI evaluation
- * change order processing

Provide close out services:

- * organize/compile/file analyses

DAM SAFETY

- * Coordinate review by DSPC and/or MSC to ensure work being performed does not constitute a Dam Safety Modification and meets requirements of ER 1110-2-1156 and NWDR 1110-1-3

Hydraulic Design

Assist other design disciplines in preparation of the contract technical specifications and drawings. Provide design data and analysis for DDR regarding collection channel weirs and orifices, collection channel enlargement, primary dewatering structure, fish transport flumes, water supply and drain piping and outfalls (only emergency and possible interim primary outfalls in 1A). Provide reviews of design packages at 60, 90 and BCOE levels of review. Assist technical lead in providing responses to Vendor inquiries during the bidding process and contractor RFIs during the construction phase. Coordinate with Environmental Resources to establish necessary biological testing. Provide reviews of biological test proposals. Participate in FFDRWG meetings to present hydraulic aspects of the project. Provide hydraulic design support for the construction and biological testing of collection channel prototype weirs and orifices.

Investigate tailrace hydraulic conditions for a range of river flow and project operations as part of a process for locating fish release outfall sites, etc. Tailrace hydraulic work require the following tasks: (1) overseeing the collection and end use of field collected ADCP flow pattern and river velocity data; (2) overseeing design, construction, and testing of a new ERDC 1:55 scale Lower Granite tailrace physical model; and (3) developing and using a new CFD numeric tailrace model.

Provide miscellaneous support to other design groups as it relates to land surveys and overall site development. Lamprey friendly design requirements would also be considered during design reviews (Foster, Laughery, or Trumbo (EA section)).

Mechanical

Provide design services (drawings and technical specifications) for mechanical items. Conduct analyses to verify mechanical integrity and associated acceptability of prototype collection channel weirs and enlarged orifices. Conduct mechanical design of additional collection channel weirs, secondary recovery device, maintenance hoist system, and enlarged orifices. Provide mechanical design for screen cleaners, hoists, and control weirs for the primary dewatering structure. Provide mechanical design for piping and valves to supply water for main supply, emergency supply, Adult fish attraction, Adult fish trap, outfall water cannon, and switch gates. Provide mechanical design for fish transport channel from the collection channel to primary dewatering, and fish transport flume from primary dewatering to the existing juvenile fish facility including facility bypass switch gate. Provide reviews of 60, 90 and BCOE levels of design packages. Provide responses to Vendor inquiries during the bidding process. Provide responses to contractor RFIs during the construction phase. Provide EDC and S&A services.

Structural

Conduct analyses to verify structural integrity and associated acceptability of modifications to collection channel. Prepare drawings and technical specifications for the collection channel modifications, fish transport channel/pipes/flumes, dewatering structure, PIT Tag detectors, emergency bypass pier supports, auxiliary water supply and outfall structures. Provide reviews of 60, 90 and BCOE levels of design packages. Provide responses to Vendor inquiries during the bidding process. Provide responses to contractor RFIs during the construction phase.

Scope of work and IGE for AE task for structural design (and P&S) inside the dam.

Co-draft the Dam Safety Mod memo for impacts to concrete portions of the dam, primarily resulting from concrete mining activities.

Contracting Division

Provide reviews of 60, 90 and BCOE levels of design packages. Participate in acquisition strategy development. Conduct market research and participate in TASB meetings for this project. Assist with preparation of source selection plan and all contract award documents. Publishes solicitation, amendments and final contract documents. Closes bidder inquiries. Awards contract and assigns ACO/COR. Reviews and approve all COR reports. Maintain contract file and perform closeout process.

Operations Division

Provide PDT members to provide operational and maintenance input and coordination. Provide reviews of 60, 90 and BCOE levels of design packages. Provide outage schedule information to the Chief of Operations at Lower Ganite dam for scheduling of construction and biological testing outages for the prototype collection channel weirs and orifices. Coordinate with Chief of Maintenance at Lower Granite dam for project support of crane usage. Provide information regarding this project to District Operations Division staff in preparation of the annual Fish Passage Plan. Ensure all reviews adequately address environmental compliance issues and the specifications prepared incorporate the necessary reports and requirements such that the Corps does not incur any environmental liability in hazardous waste management.

Environmental Analysis

Participate closely in the design of the project to ensure the biological goals of the project are met. The EA PDT member will consider fish behavior, life history, stressors, and likelihood of injury of all aspects of the design as it is developed. Further, they will identify with assistance of Hydraulic Design any deviations from NOAA Fisheries design criteria and guidelines and ensure NOAA is aware and has opportunity to provide input. Provide reviews of 60, 90, 100 and BCOE levels of design packages.

EA Section has the lead on all communication with fish managers on the Project. Ensures all FFDRWG members have opportunity of review and provide input of the project. Assist Environmental Compliance with ESA compliance.

Environmental Compliance

Prepare any necessary environmental documentation required for this project, including Bull Trout critical habitat ESA consultation. Coordinate with Hydraulic Design and Environmental Analysis sections for information related to environmental documentation and coordination under the NOAA biological opinion. Provide reviews of 60, 90 and BCOE levels of design packages.

Misc. / Other

Alaska District - Prepare drawings and technical specifications for truss over fish ladder, and structural supports for flume loops, including footings. Footing and support details will be shared with those required for NWW structural design. Conduct analyses to verify structural integrity and associated acceptability of modifications to collection channel. Provide 60, 90 and BCOE levels of design packages. Provide responses to Vendor inquiries during the bidding process. Provide responses to contractor RFIs during the construction phase.

2.0 Project Delivery Team

2.1 Team Members

| Team Member | Role | PHONE | EMAIL | Approve |
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| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/03/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/17/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/10/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/09/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/14/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 02/21/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/14/2013 |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | 01/11/2013 |

2.2 Roles and Responsibilities

PM/PDT ROLES: The PROJECT MANAGER (PM) is the team leader and is responsible to guide the PDT and review teams for the duration of the project, executing to the agreed plan scope/schedule and budget. The PM will communicate changes to these requirements and parameters with the PDT/review teams/customer and management as described in the change management plan of this PMP.

The PROJECT DELIVERY TEAM (PDT) will assist the PM to plan and execute the project. The PDT will work with the PM/RP's to understand their role and work to ensure a successful project. The PDT will maintain communication with the PM/RP to deliver the agreed products, with the agreed quality, on the agreed schedule and budget. If those elements are compromised in some way, the PDT will inform the PM and RP as early as possible to revise the plan to minimize impact to the overall project.

The RESOURCE PROVIDERS (RP) will assist the PM and PDT to properly scope the project and ensure the budget information is developed and provided to the PM. The RP will provide qualified resources to develop the product AND qualified resources to conduct quality control reviews and checks commensurate with the complexity and risks of the project. RP's will "endorse" the initial PMP and significant changes to the PMP. The RP is responsible for the quality and coordination of their deliverables with related disciplines.

3.0 Critical Assumptions and Constraints

3.1 Critical Assumptions

Assumptions:

1. Adequate funding.
2. PDT members will be able to meet the schedule.
3. Operations can continue to use smaller (unmodified) north orifices, if desired.
4. New Emergency By-pass outfall location constructed in Phase 1. New Interim Primary By-pass outfall location not constructed in Phase 1; permanent primary by-pass outfall location possibly on a different schedule or constructed by different contractor than Phase 1).
5. Walkway is required adjacent to transportation flume and outfall piping.
7. All of the collection and transportation channel mining, including larger orifices, can be completed during one in-water work period.
8. CMF is required rather than CMP for 36 inch transport downstream of dewatering unit.
9. Funding will be available for Phase 2 implementation, and therefore elements of Phase 2 will not need to be incorporated into the Phase 1 design.
10. Unit outages will be scheduled during the inwater work season to correspond with orifice installation schedule.
11. If construction schedule indicates not all of the work can be completed in the 14/15 unwatered work season, then 13/14 unwatered work season will be utilized to accomplish a portion of the work.
12. Transportation channel and gate storage pit wall thickness issue can be resolved.
13. Suitable design for collection channel wall reinforcing upstream collection channel wall (ie. anchoring for rebar or slot plug) can be determined.
14. Adult fish and debris separation unit is not required for Phase 1.
15. Loss of station service is a very rare event (maybe 1 time every 25 years) AND short event (15 minutes outage)

3.2 Critical Constraints

1. Inwater and dewatered work period during winter season from about Dec 15 to Feb 28 limits construction timeframe.
2. Construction funding.
3. No Geotech inwater exploration for Phase 1a; onland exploration is not constrained to inwater work period
4. 3D physical model completion date may affect outfall design location schedule.
5. ADCP survey window from Jan to July for various dam outflow configurations (else must wait until Aug for low flow)
6. 2D river flow modeling may affect outfall design location schedule.

4.0 Work Breakdown Structure

See attached P2 WBS which is organized by asset feature:

Collection Channel
Transportation Channel
Emergency Water Supply/Attraction
Primary Dewatering
Transport Flume
Full Flow PIT tag Detectors
Elevated Corrugated Flume Loops
River Release Pipes and Supports

DOCUMENTS

1. Phase 1 WBS from P2.pdf

5.0 Funding / Resources

5.1 Funding Requirements - Performance Measurements

The project will be 100% funded by the Columbia River Fish Mitigation Program (CRFM). This budget schedule only addresses the Phase 1 design and construction. P2 data will be updated for real time project cost estimate (SEE ATTACHED 2101 REPORTS VIEW and 564s).

Estimated Baseline Costs:

Engineering & Design: \$1560K (FY13)
Project Mgmt: \$100K (FY13)
Program and Project Mgmt: \$100K (FY13)
Contract Administration: \$40K (FY13)
Total FY13 Costs: \$1800K

Construction Contract: \$32M (FY14 award) without options

Outyear costs have not yet been identified and should be estimated by June FY13 for FY14 costs. The Total Project Cost will be included at that time as well when 564s are received from resource providers.

Biological Testing Contracts plus Administration: will be performed under separate P2 #TBD
Bio testing contract for Collection Channel Prototype Weirs is performed under P2 #396979.

5.2 Cost Sharing Agreement

The project will not have a cost share partner.

DOCUMENTS

1. Resource reportview.pdf
2. 564_LGR_JBS_P&S_FY13 Env Analysis.xls
3. 564- Structural Ph1 FY 13.pdf
4. Elec_564_LLA JFF Phase 1 P&S.pdf
5. LLA JFF Phase 1 Geotech.pdf
6. Gen Engr 564_372857- FY13 Only-12Sept12.pdf
7. Lower Granite JFF Upgrade FY13 P&S Form 2101 H-H 15May12.xls
8. Mech LLA JFF PH1 FY13.pdf
9. LLA JFF Phase 1 Civil Design.pdf
10. ERDC P2-Resource-Budget.pdf

6.0 Schedule

P2 Data: 45 current FY milestone(s) for P2#

| CODE | Description | Baseline | Current | Aactual |
|-------|-------------------------------|----------|-------------|-------------|
| CW030 | PMP Start | | 06-AUG-2012 | 06-AUG-2012 |
| CW035 | Post Approved Peer Review Pla | | 20-JAN-2012 | 20-JAN-2012 |

| | | | | |
|-------|--------------------------------|-------------|-------------|-----------------|
| CW035 | Post Approved Peer Review Pla | | 15-NOV-2012 | 15-NOV-2012 |
| CW040 | PMP Approval | | 28-JAN-2013 | 28-JAN-2013 |
| CW200 | EA or FONSI Complete | | 07-JAN-2014 | 07-JAN-2014 |
| CW200 | EA or FONSI Complete | | 13-FEB-2014 | 13-FEB-2014 |
| CW200 | EA or FONSI Complete | | 24-APR-2014 | 24-APR-2014 |
| CW200 | EA or FONSI Complete | | 10-MAR-2016 | 10-MAR-2016 |
| CW285 | VE/VM Start | | 02-DEC-2010 | 02-DEC-2010 |
| CW285 | VE/VM Start | | 02-DEC-2013 | 02-DEC-2013 |
| CW290 | VE/VM Complete | | 03-DEC-2012 | 03-DEC-2012 |
| CW290 | VE/VM Complete | | 10-DEC-2013 | 10-DEC-2013 |
| CW300 | Plans & Specs Start | | 04-SEP-2012 | 04-SEP-2012 |
| CW310 | Draft Plans & Specs Complete | | 30-JUL-2013 | 30-JUL-2013 |
| CW310 | Draft Plans & Specs Complete | | 15-JAN-2014 | 15-JAN-2014 |
| CW310 | Draft Plans & Specs Complete | | 07-APR-2014 | 07-APR-2014 |
| CW320 | BCOE Review Complete | | 17-APR-2014 | 17-APR-2014 |
| CW330 | Plans & Specs Approval | | 18-JUN-2014 | 18-JUN-2014 |
| CW400 | RTA | | 01-APR-2014 | 01-APR-2014 |
| CW400 | RTA | | 08-AUG-2016 | 02-AUG-2016 |
| CW430 | Bid Opening | | 09-SEP-2014 | 09-SEP-2014 |
| CW430 | Bid Opening | | 01-SEP-2016 | 01-SEP-2016 |
| CW440 | Construction Contract NTP Issu | | 06-OCT-2014 | 06-OCT-2014 |
| CW440 | Construction Contract NTP Issu | 14-OCT-2016 | 30-SEP-2016 | 30-SEP-2016 |
| CW470 | Project Fiscally Complete | 03-JUL-2017 | 23-JUL-2018 | No Date Entered |
| CW470 | Project Fiscally Complete | | 29-OCT-2018 | No Date Entered |
| CW801 | CW801 / A/E Contract Award | | 07-JAN-2013 | 07-JAN-2013 |
| CW801 | CW801 / A/E Contract Award | | 31-JAN-2013 | 31-JAN-2013 |
| CW801 | CW801 / A/E Contract Award | | 25-APR-2013 | 25-APR-2013 |
| CW801 | CW801 / A/E Contract Award | | 03-MAY-2013 | 03-MAY-2013 |
| CW801 | CW801 / A/E Contract Award | | 10-SEP-2013 | 10-SEP-2013 |
| CW801 | CW801 / A/E Contract Award | | 23-NOV-2016 | No Date Entered |
| CW802 | Other Contract Award | | 12-SEP-2013 | 12-SEP-2013 |
| CW802 | Other Contract Award | | 20-NOV-2013 | 20-NOV-2013 |
| CW802 | Other Contract Award | | 14-JAN-2014 | 14-JAN-2014 |
| CW802 | Other Contract Award | | 14-JAN-2015 | 14-JAN-2015 |
| CW802 | Other Contract Award | | 13-FEB-2015 | 13-FEB-2015 |
| CW802 | Other Contract Award | | 24-MAR-2015 | 24-MAR-2015 |
| CC800 | Contract Award | | 03-JUL-2014 | 03-JUL-2014 |
| CC800 | Contract Award | | 25-SEP-2014 | 25-SEP-2014 |
| CC800 | Contract Award | | 22-SEP-2016 | 22-SEP-2016 |
| CC840 | Physical Completion | 03-JUL-2017 | 31-JAN-2018 | No Date Entered |

| | | | | |
|-------|--------------------------|-------------|-------------|-----------------|
| CC840 | Physical Completion | 29-SEP-2017 | 10-APR-2018 | No Date Entered |
| CC880 | Contractor Final Payment | | 22-MAY-2018 | No Date Entered |
| CC880 | Contractor Final Payment | 03-JUL-2017 | 23-JUL-2018 | No Date Entered |

Also see schedule attached (dated Oct 2013).

Phase 1b

AE 90% design review begins - Nov 9

Advertise - May 13, 2016

CC800 - bPSC0155- LLA JFF SYS UPGRADE PHASE 1B CONSTRUCTION CONTRACT 27-JUN-2016

FY13 Baseline Milestones:

CW310 - BPS0018 - INTERIM REVIEW (60%) 15-JUL-2013 complete NOV 2013

CW310 - BPS0020 - INTERIM REVIEW (90%) 15-NOV-2013 complete Jan 2014

CW320 - BPS0040 - BCOE mtg 30-APR-2014

CW802 - PS0022 - LLA JFF TRANSPORT FLUME AWARD GEOTECH UPLAND EXPLORATION

26-APR-2013 complete

CW801 - PS0027 - JACOBS AE TASK ORDER - STRUCTURAL DESIGN IN COLLECTION CHANNEL -

26-APR-2013 complete

CW802 - PS0014G - LLA JFF RIVER RELEASE GEOTECH INWATER EXPLORATION CONTRACT

02-NOV-2013 complete Jan 2014

CC800 - fCON648 - LLA JFF Lower Concrete Plugs contract award 17-Jun-14 17 \$2.4M complete

CC800 - bPSC0055- LLA JFF SYS UPGRADE PHASE 1A CONSTRUCTION CONTRACT 25-SEP-2014

\$48M (was \$36M) complete

Phase 1a

BCOE soft print Mar 11

BCOE hard print start review; Mar 20

Pre-bid meeting/site visit solicitation Mar 21

Pre-bid meeting/site visit - Apr 8

BCOE meeting Apr 17

The PLAN IN HAND backcheck reviews are scheduled on the dates below.

5/7 Volume 3, SF sheets, truss structures

5/9 Volume 2 (Jacobs submittal is on 5/1)

5/16 Volume 4

5/16 Volume 1

5/23 Volume 3

5/23 Division 1 Specifications

P&S to CT Jun 16 (was May 30 and 13)

BCOE cert June 23 (was June 6 and May 20)

Contract adv Jul 2 to Aug 1 (was Jun 16 to July 15 and May 28 to June 27)

Amendment to extend adv to Aug 15 (was July 29 and 15)

Open bids Aug 15 (was July 29 and July 15)

Contract award Sep 8 (was Aug 15 and 1)

NTP Sept 22 (was Sept 15) NLT Oct 6

Lower Plugs

AE P&S complete Feb 19

P&S to CT March 10

BCOE cert March 19

Contract adv March 27 (target date was 9 April)
Open bids Extended to May 6 (was April 29) (target date was 9 May)
Contract award 17-Jun-14
NTP target 30-Jun-14
Unit availability:
Unit A 6 6 August 2014 thru 12 September 2014.
Unit B 5 13 September 2014 thru 14 October 2014.
Unit C 3 15 October 2014 thru 13 November 2014.
Unit D 2 14 November 2014 thru 17 December 2014.
Unit E 1 18 December 2014 thru 21 January 2015.
Unit F 4 22 January 2015 thru 23 February 2015. Completed Sep 29, 2015

DOCUMENTS

1. Schedule_23Oct13.pdf
2. LLA Phase 1 construction sched (simplified) Rev E.xlsx
3. Schedule_draft_23Oct13.mpp

7.0 Project Quality Control Plan and Objectives

7.1 Customer Objectives and Project Objectives

Project Deliverables:

- 1) Plans and Specs for use in construction contract (30/60/90/BCOE versions).
- 2) Construction of JFF upgrade Phase 1 at Lower Granite
- 3) Scope of work for ADCP task order
- 4) Scope of work for scanning task order for physical locations
- 5) Scope of work for Inland geotech exploration
- 6) Scope of work for Inwater geotech exploration
- 7) Scope of work for ERDC new Lower Granite Tailrace Physical Model

Project Objectives:

- 1) Prepare and issue high quality design documents for a contract to construct the project on-time and under budget.
- 2) Construct effective and fish friendly JFF upgrade at Lower Granite.
- 3) Demonstrate through post construction evaluations (separate project) that the JFF upgrade Phase 1 for Lower Granite dam improves biological survival.

Customer Objectives: Construct fish friendly JFF upgrade Phase 1 which improves biological survival in the bypass passage route.

7.2 Quality Management Plan

PDT will meet on monthly basis to review status of activities and discuss issues (if any) including Technical, schedule and budget issues.

Conduct District Quality Control Reviews at 60%, 90% and BCOE levels of completion of the design package(s).

Based on a risk informed determination (see attached), an ATR is required and will begin sometime after 30% review but prior to 60%. Also see attached NWD approved ATR plan.

Quality Assurance surveillance Plan (QASP) will be developed by Construction Branch prior to construction contract award. Use the PLAN, DO, CHECK, ACT cycle to assess progress, make course adjustments as necessary, and ultimately achieve installation of the JFF upgrade system.

DOCUMENTS

1. Risk Informed Review Selection Phase 1 rev A.pdf
2. ATR review plan signed NWD memo.pdf

8.0 Acquisition Strategy

SUMMARY OF ACQUISITION STRATEGY:

See attached TASB form.

Involves 3 major contract actions - (see below for additional acquisition strategies)

1. CONTRACT FOR Phase 1 effort
INITIAL ACQUISITION STRATEGY PROVIDED BELOW
Contract actions are required?: Yes
Estimated value of contract anticipated: \$25M
Sole-Source? No

Procurements Anticipated: Construction

Service/Supply No
Supply/Install NO
A-E Contracts NO

Acquisition action: Invitation for Bids (IFB) YES
Request for Proposal (RFP) NO
Simplified (Commercial; Non-Commercial) NO
Other (Describe)

Procured via: Open Competition

2. CONTRACT FOR BIOLOGICAL TESTING - HYDROACOUSTICS - FGE STUDIES performed under separate P2 #

3. CONTRACT FOR MONITORING (FISH INJURY STUDIES) performed under separate P2 #

4. Supporting contracts and task orders:
ADCP survey - AE IDIQ task order
scanning for physical locations - AE IDIQ task order
Inland geotech exploration - Service contract
Lower Granite 1:55 Physical Tailrace Model - ERDC MPPR
Jacobs AE task - structural design effort inside dam
42 inch pipe inspection service contract
Inwater geotech exploration - Service contract

DOCUMENTS

1. Task Worksheet LLA JFF Upgrade Phase 1 revA signed.pdf

9.0 Risk Analysis

Risk matrix draft is attached.

1. FUNDING RISK: The SCT / CRFM has committed to providing funding.

2. SCHEDULE RISK:

- a. Design/review schedule; PDT resource availability
- b. Acquisition schedule; award protest
- c. Construction schedule; incapable contractor

3. Worker Safety: The construction will be done in a dangerous environment with the potential for falling objects, and working above water. Contractor worker safety will need special attention in the plans, specs, and reviews, and construction management.

DOCUMENTS

1. Fish Transport Pipe Closed Circuit Television (CCTV) signed.pdf
2. LLA JFF Upgrade Phase 1 Risk Management Matrix.xlsx

10.0 Safety and Occupational Health Plan

1. Review contractor accident prevention plan and activity hazard analysis during construction phase.
2. The PDT will assure the transfer of hazard information to the user through the use of documentation or verbal communications.
3. The PDT will assure all safety and occupational health lessons learned are submitted to the lessons learned system.
4. Quality Assurance surveillance Plan (QASP) will be developed by Construction Branch prior to award. Use the PLAN, DO, CHECK, ACT cycle to assess progress, make course adjustments as necessary, and ultimately achieve installation of the Lower Granite JFF Phase 1 upgrade.

11.0 Change Management

Revised change management plan effective July 1, 2011 -

The change management SOP is located at:

<https://kme.usace.army.mil/NWD/NWW/PPPPMD/Change%20Management/Forms/AllItems.aspx?RootFolder=%2fNWD%2fNWW%2fPPPPMD%2fChange%20Management%2fCurrent%20Policy&FolderCTID=%2fView%7b8EA1FD5A%2dC1C6%2d4741%2dAC21%2d43FBC81A1C4D%7d>

The TPC for Phase 1 is about \$32M. Therefore, according to the table in the SOP, approval for cost changes greater than 15% (\$5M) is reserved by the Operations Change Control Board. Approval for cost changes less than or equal to 15% may be approved by the PM, in coordination with the CRFM Program Manager.

Also approval of changes to HQ monitored Milestones or changes impacting critical work windows is reserved by the Operations Change Control Board. Approval for changes to NWW monitored Milestones may be approved by the PM, in coordination with the CRFM Program Manager and Project Operations.

A Cost Change Request form will be completed for changes that require Operations Change Control Board approval. Also, changes to construction contracts will require a CCR form to document the change for Construction Branch.

RESPONSIBILITIES:

1. The PM is responsible for overall change management. The PM will advise the CENWW Project Review

Board (PRB) of significant changes in project risk.

2. All construction schedule changes, even minor, must be coordinated with Lower Granite technical staff.
3. The Chief of Operations, advised by the Lower Granite Operations Manager, is the final decision maker for construction schedule changes.
4. The CRFM Program Manager, advised by the regional System Configuration Team (SCT), is the decision maker on budget changes.
5. The CENWW Chief of Engineering and Construction, who is concurrently the CENWW Dam Safety Officer is the final decision maker on any project change that has dam safety including employee or contractor safety implications.
6. The PDT is responsible for notifying the PM of any potential changes that will impact the project scope, cost, schedule, quality, or risk. For anticipated or known changes to a project, the PM/PDT will use the change management process. Changes to a project should be communicated and documented using the Change Request Form.

DOCUMENTS

1. PCR weir descope from phase 1a.pdf

12.0 Communications

12.1 Internal Communications

1. The PM and PDT will maintain electronic files in PrjMgmt drive V:\Construction General\CRFM - LLA Juvenile Bypass System Upgrade. Files on this drive will include 564 Budget Estimates, Project Management files, Schedules, Trip Reports, Photos, Contracting files, and Environmental files.
2. Discipline specific files (i.e., Structural Design, Mechanical Design, etc.) will be maintained within the section and available and accessible upon request.
3. Before contract award, the Engineering lead will coordinate with the PDT and develop Engineering Considerations and Instructions (ECI) for field personnel. The document will be routed through the PM to the appropriate resident engineer (RE).
4. The PM will work with the Quality Manager to initiate and coordinate Lessons Learned and After-Action Reviews. The PM will work with the Quality Manager to ensure that Lessons Learned and AARs are documented and filed appropriately.
5. The PM will develop and distribute email distribution lists to ensure stakeholders, internal and external PDT members, and other parties are receiving project communications at the appropriate levels. These lists will be maintained/updated/revised by the PM if PDT members are reassigned or new appointees.

12.2 External Communications

The Fish Facility Design Review workgroup (FFDRWG) will be briefed at each quarterly meeting held in NWW district throughout the life of the project.

Operational changes that would affect the Fish Passage Plan will require communication with FPOM and/or inclusion of work into the Fish Passage Plan.

12.3 Customer/Partner Communications

13.0 Value Management Plan

1. The project meets cost criteria of ER 11-1-321.
2. VE study during feasibility was conducted in 2008 (see attached). A VE evaluation will be required for for Phase 1, to determine if VE recommendations are adopted or not, and VE savings that can be claimed for Phases 1a and 1b. If Phase 2 is designed, it would also require a VE study, to determine if VE recommendations are adopted or not, and VE savings that can be claimed.
3. VE was conducted on a portion of the Fish slot/Wagner Horn specific element of this project in 2013. See VE screen document attached.
4. Phase 1b is mostly the outfall. A VE was conducted for MNA (McNary Outfall VE Disposition Jul 2010), and the single pier supports had a substantial savings. Since the scope is similar, VE savings will be documented using the prior study as applied to the new project.

DOCUMENTS

1. LGR JFF Mods_VE STUDY REPORT_FINAL.pdf
2. VE Screen-StrategyComboVMP_B0 14 3_Wagner Horn LLA Juv Fish Facility.pdf

14.0 Close Out

Checklist for Activity/Project/Program Closeout (PROC4000)

1. Verify physical and fiscal completion.
2. Complete contractor evaluations, transfer of O&M manuals, and as-built drawings.
3. Verify that all goods, services, products or other deliverables been turned over to the stakeholders.
4. Resolve unliquidated obligations and commitments in CEFMS.
5. Prepare AAR/Lessons Learned.

15.0 Environmental

NEPA: Categorical Exclusion

This proposed action qualifies as rehabilitation and replacement of existing structures at a completed Corps project which carries out the authorized project purposes.

NHPA: No historic properties affected

The project APE appears to be located in a previously disturbed area. If so, documentation will be completed in accordance with the FCRPS Programmatic Agreement. However, as planning progresses, if the APE is found to extend out or downward into previously undisturbed areas, consultation with SHPO and Tribes may be needed.

ESA: Biological Assessment - Informal Consultation

BA may be necessary to evaluate impacts to bull trout. ESA species covered by NMFS should be covered by the FPOM process and the FCRPS 2008 Biop. Biologist will check with Services.

FWCA: Not applicable

This proposed action is not subject to this act.

Clean Water Act (section 401/404): Nationwide Permit - Already 401 Certified

This proposed action meets the requirements of Nationwide Permit (NWP) 3, Maintenance which is already certified for Section 401.

Clean Water Act (section 402):

Rivers and Harbors (section 10): Not applicable

This proposed action is not subject to this act.

CERCLA:

RCRA:

TSCA:

CAA:

16.0 Geospatial Data Management Plan

Phase 1 may require CADD/GIS data for layout and documentation of as-built locations. Scanning contract will document 3D locations of as-built features. Recommended that post construction (as-built) should require contractor to provide 3D scanned locations for uploading.