



Portland General Electric Company
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October 30, 2020

Via Electronic Filing

Public Utility Commission of Oregon
Attention: Filing Center
201 High St SE, Suite 100
Salem, OR 97301

RE: Docket UE 230 - Annual Boardman Decommissioning Update - 2020

Dear Filing Center:

Enclosed for filing in the above referenced matter please find the following:

Electronic copy of:

- **Discussion and Summary (Attachment A)**
- **2020 Boardman Cost of Removal Calculation (Attachment B)**
- **2020 Updated Boardman Coal Plant Decommissioning and Demolition Plan (Attachment C)**
- **2021 Incremental Revenue Requirement (Attachment D)**

PGE is supplementing the record in docket UE 230 (Boardman Tariff Advice Filing) to include an updated decommissioning and demolition (D&D) plan, a current cost of removal estimate, and incremental revenue requirement. The D&D plan, updated in 2020 by AECOM Technical Services, Inc., provides a Level 2 detailed decommissioning cost estimate for full decommissioning and demolition of the Boardman plant beginning at the end of 2020 and likely continuing through 2023. PGE's current cost of removal estimate is based on this updated D&D plan and while the current estimate is close to amounts PGE has collected, final costs remain uncertain. In order to balance this risk, while also providing a near-term reduction to customer prices, PGE proposes reducing the collection amount for 2021 to 50% of the current annual amount. PGE expects to have a vendor selected for major work packages around the third or fourth quarter of 2021, which will provide more certainty around final D&D costs.

If you have any questions, please contact me at (503) 464-7805 or Greg Batzler at (503) 464-8644. Please direct all formal correspondence and requests to the following e-mail address: pge.opuc.filings@pgn.com.

Sincerely,

/s/ Jaki Ferchland

Jaki Ferchland
Manager, Revenue Requirement

BOARDMAN TARIFF UPDATE

SCHEDULE 145

DISCUSSION

I. Boardman Tariff Advice Filing

Pursuant to Order No. 11-242 in docket UE 230, Portland General Electric Company (PGE) submits this Supplemental Filing that provides new information regarding the Boardman Power Plant Decommissioning Adjustment Tariff (Schedule 145). This filing updates the information in support of docket UE 230 (Boardman Tariff Advice Filing) to include a new and final decommissioning and demolition (D&D) plan prior to the start of decommissioning the plant and ultimately full demolition activities for the majority of Boardman-related facilities. This filing also includes, as Attachment B, an update to total forecasted D&D related costs based on the current plan and the expected collections through 2020.

II. Background

The Oregon Regional Haze Plan (Haze Plan) and Oregon Utility Mercury Rule (Rule) requirements for Boardman led PGE to evaluate the risks and benefits of making substantial investments in new emissions controls against the risks and benefits of ceasing plant operations. In its Integrated Resource Plan (IRP) submitted November 2009 (LC 48), PGE presented the Public Utility Commission of Oregon (Commission or OPUC) with alternative scenarios ranging from a complete shutdown in July 2011 to installing all pollution control equipment required to fully comply with the Haze Plan and the Rule. During the IRP process, additional alternatives were evaluated, and PGE's final

recommendation, acknowledged by the Commission, included the cessation of coal-fired operations by the end of 2020.

The Commission adopted Staff's recommendation to include an increase in depreciation/amortization expense and the decommissioning costs related to the planned Boardman plant closure advancing from 2040 to 2020 in PGE's revenue requirement, subject to the following conditions:

1. Beginning June 15, 2012, PGE will submit an annual informational report to all parties in the UE 230 proceeding that will include the current balance of dollars collected for decommissioning and any relevant changes to PGE forecasts of future decommissioning costs;
2. PGE shall submit its November 1st Annual Update as a supplemental filing to this docket (UE 230).

III. Current Study

The new plan documents are very similar to the last study provided, updated with a more detailed review of the cost and activities required for final decontamination, decommissioning and demolition of Boardman. This new study only contemplates full decommissioning as PGE has determined there is no viable path forward for beneficial reuse of the facility. The new study is also intended to support a request for proposal (RFP) process to secure competitive bids and select a contractor to perform demolition activities.

Both the prior (2019) and current (2020) AECOM study categorize the Boardman D&D project into three phases: planning, engineering, and execution. The planning phase (Phase 1), which began in 2015 (as outlined in the 2015 study), continued into 2020. This

phase included initiating the permitting process, updating the D&D Plan including cost estimates, Site Certificate termination planning, and additional analyses and planning, as outlined in the D&D plan.

The engineering phase (Phase 2) began in 2019 and will continue through 2020. This phase includes an Environmentally Regulated Materials (ERM) survey, the continuation of permitting, an updated closure strategy, and additional D&D planning. Focus will be on the procurement of Phase 3 services including demolition and abatement contractor bids. A specialized vetting process will be utilized to short-list best-in-class contractors with the ability to execute the project in a safe and timely manner. Focus will be placed on clearly defined work scopes in order to facilitate competitive bid packages and specifications with contractual and project risk mitigation requirements, including prohibiting certain high-risk approaches. Additionally, an economic evaluation will be conducted to estimate cost and risk associated with recovery, re-use, and recycling of materials.

Finally, the execution phase (Phase 3) will occur in 2020 through 2023 and will include coal yard reclamation, mining or closing of the ash disposal facility, Carty separation activities, decommissioning to cold, dark, and dry, demolition and ERM abatement, and site restoration. The execution phase encompasses both pre-demolition and demolition activities.

A full copy of AECOM's plan, including detailed cost estimates and schedule is included as Attachment C to this filing.

IV. Recommendation

Similar to previous studies, the final costs associated with decommissioning and demolition of Boardman are still, to some extent, uncertain. Thus, while the current estimate is very close in total cost to the amounts PGE expects to have collected through 2020, it is still based on the range of uncertainty with a Class 2 study of -20% to +20%,¹ leaving some level of uncertainty as to what final costs for the decontamination, decommissioning, and demolition of Boardman will amount to. To balance this uncertainty with providing a near-term reduction to customer prices, PGE proposes reducing the collection amount for 2021 to 50% of the current annual amount. This provides customers with a reduction in Schedule 145 prices, while protecting against the price volatility risk of competitive solicitations that result in actual D&D costs higher than currently estimated. A revenue requirement reflecting this reduced collection amount is provided as Attachment D.

PGE expects to have greater clarity regarding some of the major costs, including the cost of demolition, after reviewing the RFP results and signing a contract for major work packages sometime in the third to fourth quarter of 2021. As such, PGE will have more certainty around the full cost of decommissioning prior to filing to revise Schedule 145 for 2022 and we will update Schedule 145 on January 1, 2021 to reflect a more accurate accounting of final decommissioning costs.

¹ As defined by AACE International – The Authority for Total Cost Management (AACE)



Updated Boardman Coal Plant Decommissioning and Demolition Plan

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August 2020

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Acronyms and Abbreviations

ACM	Asbestos-Containing Material
ADA	Ash disposal area
AECOM	AECOM Technical Services, Inc.
AHERA	Asbestos Hazard Emergency Response Act
AMP	Air Monitoring Plan
BCP	Boardman Coal Plant
BG	Below Grade
CABR	Calcium Bromide Injection
CCR	Coal Combustion Residuals
C&D	Construction and Demolition
CFR	Code of Federal Regulations
CGS	Carty Generating Station
CHI	Calcium Halide Injection
D&D	Decommissioning and Demolition
DEQ	Oregon Department of Environmental Quality
DOT	Department of Transportation
DSI	Dry Sorbent Injection
EFSC	Energy Facility Siting Council
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ERM	Environmentally Regulated Materials
ESCP	Erosion and Sediment Control Plan
IR	Investment Recovery
LCP	Lead-Containing Paint
MSCCAA	Multi-Species Candidate Conservation Agreement with Assurances
NF	Non-Friable
NMP	Noise Monitoring Plan
NPE	Negative Pressure Enclosure
NTEC	Nuclear and Thermal Energy Council
OAR	Oregon Administrative Rule
ODOE	Oregon Department of Energy
OHA	Oregon Health Authority
OSFA	Oregon Office of the State Fire Marshal
OSHA	Oregon Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PGE	Portland General Electric
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QC	Quality Control Plan
RACM	Regulated Asbestos-Containing Material
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
RMA	Return Material Authorization
RML	Radioactive Materials License
RMP	Recycling Management Plan
SPCC	Spill Prevention, Control, and Countermeasure
TCP	Traffic Control Plan
TRI	Toxics Release Inventory
TSCA	Toxic Substances Control Act
TSI	Thermal System Insulation
WPCF	Water Pollution Control Facility Permit
XRF	X-Ray Fluorescence Device

1. Introduction

Portland General Electric (PGE) has tasked AECOM Technical Services, Inc. (AECOM) with updating the Decommissioning and Demolition (D&D) Plan and associated cost estimate to support the planning and preparation for the demolition of the Boardman Coal Plant (BCP or the Site). The BCP is a 617-megawatt coal-fired facility located adjacent to Carty Reservoir on Sixmile Canyon, approximately 13 miles south-southwest of Boardman, Oregon (Figure 1-1). The plant was constructed in the late 1970s and operation commenced on August 3, 1980. The plant is scheduled to stop burning coal by December 31, 2020. The demolition and closure are referred to herein as the “project”.

1.1 Background

The BCP site is located between Sixmile Canyon and Poverty Ridge adjacent to the north side of the Carty Reservoir. The plant site encompasses approximately 200 acres south of the Columbia River. The site topography is relatively flat and marked by flat ridges with gentle slopes descending into the shallow canyon. The terrain features sparse vegetation with sagebrush, thistle, juniper, and sand and wind-eroded soil (Bechtel, 1982).

1.2 Objectives

The objective of BCP decommissioning is to remove all equipment and areas associated with the power block, supporting structures, coal, dry sorbent injection (DSI), activated carbon and halide injection, and ash handling and storage; to abate environmentally regulated materials (ERM) where practical; remediate any residual contamination from plant operations; and close out the coal yard and ash disposal area.

1.3 Work Overview

The project will occur in three phases: planning, engineering, and execution. The planning phase (Phase 1) began in 2015 (by others) and AECOM began work in January of 2019 and continued into 2020. The planning phase included initiating the permitting process, an updated D&D Plan, a revised cost estimate, Site Certificate termination planning with PGE and the Oregon Department of Energy (ODOE), Carty-Boardman utility separation memorandums, ash disposal area cap analysis, assessing salvage and investment recovery (IR) options, and procurement of Phase 2 services.

The engineering phase (Phase 2) began in 2019 and will continue through 2020 and includes an ERM survey, continuation of permitting, updated closure strategy, D&D planning, development of detailed demolition, remediation, and abatement plans, drawings, and risk based specifications, asset inventory transfer or valuation, site and structure specific risk assessment, contractual and schedule risk register, utility isolation of the Carty Generating Station (CGS), and procurement of Phase 3 services including demolition and abatement contractor bids. A specialized vetting process will be utilized to short-list best-in-class contractors with the ability to execute the project in a safe and timely manner. Focus will be placed on clearly defined work scopes in order to facilitate competitive bid packages and specifications with contractual and project risk mitigation requirements, including prohibiting certain high-risk approaches. In addition, an economic evaluation will be conducted to estimate cost and risk associated with recovery, reuse, and recycling.

The execution phase (Phase 3) will occur in 2020 thru 2023 and will include coal yard reclamation, closing of the ash disposal facility, CGS separation activities, decommissioning to cold, dark, and dry, demolition and ERM abatement, site restoration, project monitoring, construction administration, and construction management. The execution phase encompasses pre-demolition and demolition activities. Pre-demolition activities will consist of completing the isolation of the CGS, placing the BCP into cold, dark, dry, and safe status, performing decontamination and ERM abatement, and completing asset disposition. Demolition activities will consist of ERM abatement and demolition of all utilities not designated to remain to 2 feet below grade (BG) while leaving all foundations, roads, parking areas, rail lines, and transmission lines in place.

Waste and recycle types include asbestos-containing material (ACM), lead-containing paint (LCP), universal waste, hazardous and non-hazardous waste, and construction and demolition (C&D) waste. Waste minimization techniques have been planned to maximize the amount of material that can be recycled and/or reused. For instance, concrete and existing soil may be used for backfill material to reduce the volume of material requiring offsite disposal and minimize the quantity of materials imported for backfill. Materials that will be recycled include ferrous and nonferrous

metal, electronic and process equipment, spare parts inventory, and high-value alloys, all of which will be closely tracked to assure maximum benefit to PGE. Demolition of the selected structures involves a significant amount of ACM removal and lead controls during demolition.

The work will be performed in a sequenced manner, taking into consideration safety, quality, efficiency, effectiveness, and protection of the environment. The entire demolition process must be organized and coordinated precisely to assure these considerations are met. The first step in the sequence is to obtain all permits necessary to perform the demolition. Subsequently, tanks and vessels will be decommissioned, and the plant will be shut down with all systems purged by PGE. The exact sequence of work will be finalized during the permitting and preparation of the bid documents, technical specifications, and supporting documents. Some activities will be completed in parallel or intermittently.

1.4 Critical Success Factors

The following factors were identified as critical to the success of the project:

1.4.1 Safety

- Prevent fatalities, lost-time accidents, injuries, vehicle accidents, or damage to protected equipment, with a goal of zero recordable injuries.
- Safely decommission and demolish all designated structures.
- Leave the site in a safe and secure condition.

1.4.2 Environmental

- Incur no notices of violation as a result of project-related activities.
- Avoid spills of waste material onsite and offsite (e.g., roadways, river).
- Handle regulated materials and waste within regulatory guidelines.
- Secure all permits on time to support associated work.
- Comply with and successfully transition all operating permits.
- Return the site to a condition that meets applicable environmental regulations.

1.4.3 Work Quality

- Complete the various project tasks to meet stakeholder (plant, non-PGE organizations, Public Utility Commission, etc.) expectations.
- Engage in strategic coordination and avoid interruption of CGS operations.
- Avoid negative media coverage.
- Provide complete and timely communications with stakeholders.

1.4.4 Schedule

- Maintain an agreeable project schedule among stakeholders.

1.4.5 Financial

- Understand the relationship between scope elements and project cost plan.
- Maintain actual cost versus planned costs.
- Leave the site in a manner that reduces operations and maintenance requirements to the extent practicable.
- Anticipate any cost deviations and provide explanations and recommendations to minimize impact.

Changes necessary to successfully complete the scope of work should be reported to PGE. If project team members foresee that changes to the implementation plan will impact the budget, schedule, or other project constraints, the effect should be determined. Immediate communication with PGE for discussion and follow-up action is required.

1.5 Risk Management

Risk management during the project will include:

- Demolition risk identification and assessment, prior to specification development.

- Development of performance-based specifications with few, if any, scope gaps that could result in change orders.
- Specialized vetting process to select contractors with proven safety and performance records.
- Preparation of documents to support the highest asset recovery financial return with a systematic and comprehensive approach that focuses on safety, compliance and cost-effective solutions.
- Specifications with an environmental, health, and safety focus that incorporates proven mitigation guardrails.
- Contractors developing their own means and methods from performance-based specifications that utilize a proven and tested safe approach to higher-risk demolition activities.
- Full-time personnel to monitor contractor’s activities during abatement, remediation and demolition.

1.6 Key Assumptions and Considerations

This D&D Plan has been prepared based on key assumptions and considerations generated to accommodate the anticipated end-use once demolition is complete. Table 1.1 provides the key assumptions and considerations.

General	Demolished concrete will be crushed and reused on-site as fill, as practical.
	Fly ash storage dome and silos will be emptied.
	Stockpiled concrete debris will be crushed and used as backfill.
	Any soil for backfill or other use will come from existing onsite borrow sources.
	Tanks and systems will be drained except for some residual.
	Two lined sewage lagoons will remain for use by CGS until CGS constructs its own septic system and then they will be removed.
	Rail line will be left in place.
	Microwave on power block structure will be reused.
	Parking lots and paved areas will be left in place.
Demolition	Most structures will be demolished down to -2 feet below existing grade. Structures with slab on grade will be demolished to ground surface.
	All underground tanks and associated piping will be decommissioned per Oregon Department of Environmental Quality (DEQ) requirements.
	Asbestos abatement of interior materials will be performed prior to demolition. Exterior “galbestos” siding will be removed in close conjunction with demolition but will not be felled or dropped.
	Discharge channel will be left in place
	Intake structure will be protected and remain in place.
	Small wash water pond near vehicle maintenance and fueling area will be demolished and backfilled.
	Concrete settling basin for clarifier in coal yard will be removed to -2 feet below surrounding grade and backfilled.
	Site will be graded post-demolition so that water does not pond and left in a stable condition.

1.7 Sustainability

During the planning, design, and execution of the project, efforts to incorporate sustainability best practices into the decommissioning and demolition process will be implemented where practicable. These include efforts to minimize air emissions, reduce waste, recycle materials, protect sensitive areas, control pollution and utilize local resources. Sustainability requirements and metrics will be incorporated into scopes of work for design and execution. Efforts to improve sustainability on the project that may be implemented include, but are not limited to:

Minimizing air emissions, including greenhouse gases:

- Use cleaner fuel types for on and off-road equipment, including using electric-powered vehicles and equipment when available
- Give preference to or require diesel equipment meeting DEQ's clean diesel standards (i.e. new or retrofitted vehicles)
- Restrict vehicle idling
- Reduce transportation miles by
 - Disposing of material, such as crushed concrete, onsite as clean fill
 - Using local sources of import materials such as soil and gravel
 - Selling and donating assets and recycling and disposing of wastes locally
 - Hiring local contractors to reduce mobilization and demobilization distances
 - Conducting video and phone meetings to avoid travel

Reducing waste and recycling materials

- Reuse, sell or donate assets which retain value
- Recycle metals and other recyclable materials; use landfill disposal as a last choice for waste management
- Dispose of clean fill on site (also a strategy to minimize emissions, see above)
- Use recycled, reusable and recyclable materials for any temporary structures, if feasible

Protecting sensitive areas and controlling pollution

- Implement dust, erosion and sediment control best practices (e.g., minimize disturbance areas, wheel washing, dust monitoring and control, erosion and sediment control at site perimeters)
- Use non-toxic or less toxic chemicals
- Monitor and limit noise and light pollution

Considering impacts to employees and the community

- Leverage skills of Boardman employees to complete decommissioning activities
- Hire local contractors when possible to direct investment back into the local community (also a strategy to minimize emissions, see above)

To ensure that sustainability measures are successfully implemented, PGE will request and consider information on sustainability during procurement, including contractors' experience with sustainability best practices and tracking on previous projects. The selected contractor will also be required to prepare a written Waste Management Plan providing details on how sustainable construction/demolition activities will be implemented. Reused, recycled and disposed materials will be tracked throughout site activities to measure success.

1.8 Extent of D&D Activities and Facilities to Remain

The BCP property is currently fully operational and is operated and maintained by PGE and on-site contractors. The CGS property is adjacent to BCP and will remain fully operational after BCP decommissioning. Some systems and portions of the BCP property are currently being utilized by CGS and must be protected and maintained as detailed in the AECOM system isolation memos. Figures 1-2 through 1-10 shows the structures for demolition and the structures to remain and environmental decision units.

1.8.1 BCP to be Removed

- **Coal Handling East Area (Dumper Bldg. through TP4)**
 - Unloading Electrical Building
 - Dumper Building and Control, Rail Car Positioner, Rail Car Wash, and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
 - Thaw Shed and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
 - Transfer Point #1 (TP1)
 - Emergency Dump Structure and Reclaim Pit #1
 - Transfer Point #2 (TP2)
 - Conveyers from TP1 to TP4
 - Transfer Point# 3 (TP3)
 - Coal Yard Clarifier Buildings and Settling Basin
 - Stacker/Reclaimer #2
 - Transfer Point #4
- **Coal Handling West Area (Past TP4 through Crusher Building)**
 - Conveyers from TP4 to Crusher Building, including conveyor support structure
 - Stacker/Reclaimer #3
 - Transfer Point #5
 - CHI Tanks
 - Crusher Building
 - Coal Yard Control Building
 - Coal Yard Lunchroom
 - 120V Distribution Box
 - Sheds
 - Reclaim Pit #2 and Light Tower
- **Power Block and Precipitator Stack (Including Stack and Admin Building)**
 - Conveyers from Crusher Building to Transfer Structure, including suspended conveyor supports
 - Transfer Point Structure
 - Precipitator Building and associated equipment
 - Economizer Ash Storage Tank
 - Stack
 - North and South Drive Houses
 - Activated Carbon System
 - Warehouses 6 and 7
 - Filtered Water Tank
 - Neutralization Tank
 - Flue Gas Conditioning Tank
 - H2N2 Storage
 - Aqueous Ammonia Tank

- Amine Tank
- Lube Oil Storage Tanks
- CO2 Storage
- Oil Storage Shed
- Power Block (Boiler, Turbine, Control, and Auxiliary Areas)
- Condensate Storage Tank
- Demineralization Water Storage Tank
- Admin Building/Warehouse
- **Ash Handling Equipment and Area**
 - Lube Oil Shed and Conex
 - Warehouse 4
 - Contractor Warehouse
 - Scale
 - Load Out Trailer and Unloading Bins
 - Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, and Shed)
 - Dry Sorbent Injection (DSI) System
 - Waste Oil Storage Tank and Oil/Water Separator
 - Maintenance Conexes
 - Settling ponds
 - Old guard shack
- **Maintenance Area/Boneyard**
 - Fuel Island and building
 - Sheds
 - Bone Yard
 - Vehicle Maintenance Building
 - Railcar Maintenance Building and rail spur through
 - Warehouse 2
 - Warehouse 3
 - Multi-Purpose Building
 - Washwater Pond

1.8.2 BCP Structures to Remain

- 300,000-gallon potable/fire water tank and associate existing water pipeline
- 230 kV BCP to Dalreed transmission line
- 34.5 kV BCP to railroad crossing at Tower Road transmission line
- 7.2 kV underground distribution line connecting new 230kV substation to the construction substation
- 12.5 kV underground distribution line connecting the construction substation to Boeing Well pump
- 480-volt underground distribution line connecting the 34.5 kV transmission line to the Carty Reservoir seepage pumps
- 500 kV Grassland to Slatt transmission line
- Carty Reservoir, the portions of the existing Water Discharge Channel included in the site certificate for CGS, and the raw water Intake Structure
- Boeing Well and pump
- Construction substation
- New guard shack
- Tower Road

- Evaporation ponds
- All rail throughout site, except for the two sections (dumper building/thaw shed and railcar maintenance)
- 230 kV and 500 kV Transformers and the associated rail leading to Transformer
- Helicopter pad and road leading to
- Fuel oil storage tank and associated filling/dispensing system

2. General Description and Sequencing of Work

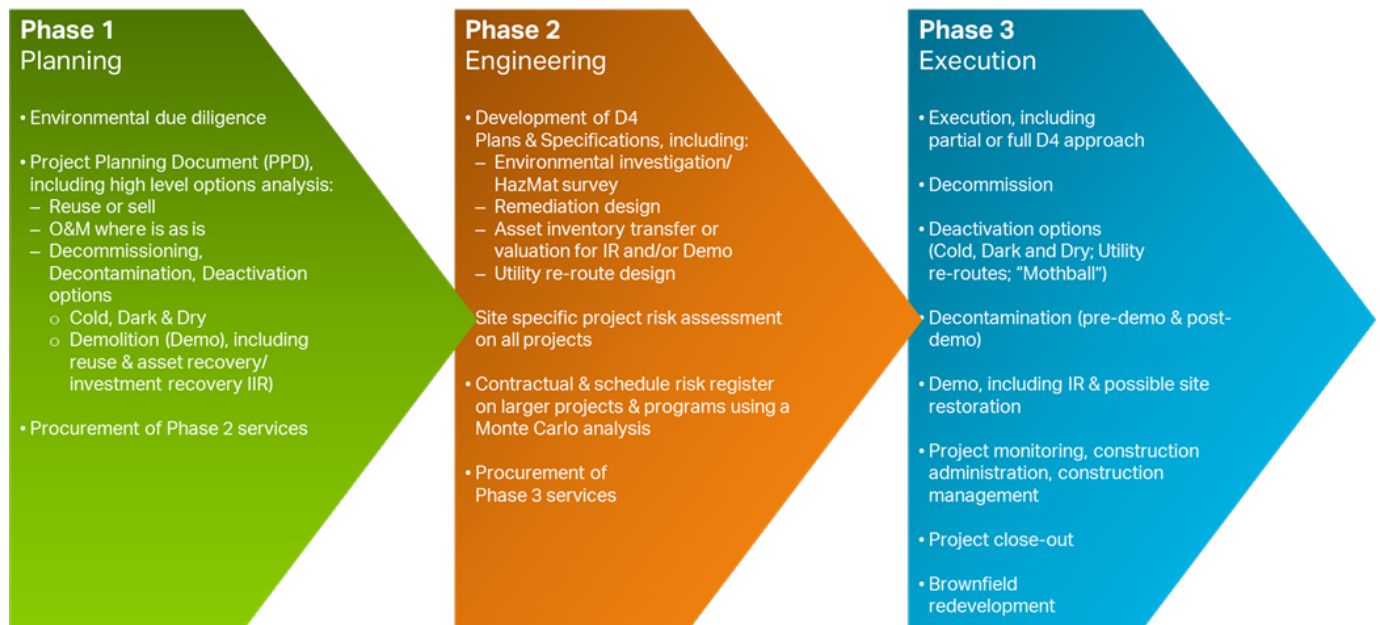
2.1 General

Generally, the project will continue following the Phase 1, 2, and 3 approach, defined by the Project Management Institute (PMI), as detailed in **Figure 2-1**.

- Phase 1 - A framework to provide the Design Team with the most accurate and reasonable planning documents needed to make the best D&D decisions
- Phase 2 - Design and engineering for the development of the Request for Proposal (RFP) scope
- Phase 3 - D&D execution

Phase 1 provides PGE clear options and the basis for detailed Design and Engineer bid documents for Phase 2. Contractors use these Phase 2 documents to provide competitive pricing to safely complete the projects in an environmentally compliant manner in Phase 3.

Figure 2-1. AECOM D4 Power Plant D&D Approach to the PMI Phase 1, 2, and 3 Sequencing



2.2 Site Permits and Their Disposition

2.2.1 Site Certificate

The BCP is operated under a Site Certificate issued by the Nuclear and Thermal Energy Council (NTEC), created in 1971 and subsequently replaced in 1975 by the Energy Facility Siting Council (EFSC). Section IV.A.1 of the Site Certificate establishes the date the Site Certificate was executed as the operative date for determining applicable law. The Site Certificate was "executed" on March 24, 1975; therefore, PGE and the State are bound by the laws and administrative rules in effect on that date. The statutory provisions governing the NTEC on March 24, 1975 were set forth in ORS 453.305 to 453.595 (1973). The statute authorized the NTEC to "adopt safety standards promulgated as

rules for the operation of all thermal power plants and nuclear installations”; however, standards related to closure or retirement were not among those listed (See ORS 453.505(1) (1973)). Because the current site certificate termination and facility retirement rules provided in Oregon Administrative Rule (OAR) 345-027-0110 were not in place when the site certificate was issued, therefore those rules are not applicable to the closure and decommissioning of BCP and termination of that site certificate. As follows, the only applicable rule is provided in 345-26-095, requiring PGE to provide the Council with an annual financial report demonstrating financial and physical plans for retirement of the plant, or any changes in the status of these contracts and retirement plans.

Per this determination, PGE will provide ODOE with the final D&D Plan, including the financial and physical plans for retirement of the facility (OAR 345-26-095). There is no “action” by ODOE or the Council.

2.2.2 Applicable Permits

The overall goal for permits pertaining to operation of BCP is to phase out those that are considered unnecessary, with measures/triggers dependent on milestones within the decommissioning process.

2.2.2.1 Water Pollution Control Facility Permit

Waste streams associated with the BCP, including sewage, ash, wastewater, and stormwater are managed per a Water Pollution Control Facilities Permit (WPCF) issued by DEQ and governed by EFSC. This permit (File #70795) covers both BCP and CGS. The WPCF permit and associated plans (i.e., Operations, Monitoring & Maintenance Plan and Groundwater Monitoring Plan) will be modified to account for anticipated changes in waste streams that occur as a result of closure and decommissioning. The WPCF permit expires on April 30, 2023; when the renewal application is submitted to DEQ, PGE will request removal of BCP specific conditions. The ash landfill is currently managed in accordance with WPCF permit requirements and under federal CCR rules. Conditions associated with the ash landfill will either remain in the WPCF permit, be moved into a separate WPCF permit or managed solely under federal CCR rules (see 2.2.3.2). Although the ash landfill may continue to be permitted under the same WPCF permit as CGS, the ash landfill does not become part of the environmental obligations associated with CGS.

2.2.2.2 Title V Air Quality Permit

Boardman air emissions are permitted through DEQ’s Title V program. Like the WPCF, the Title V permit is a shared permit for BCP and CGS (25-0016-TV-01). Following decommissioning of the BCP, conditions specific to Boardman will be removed. PGE will alert DEQ to the decommissioning of BCP via the renewal application, due August 2020.

2.2.2.3 Acid Rain Program

PGE will notify the U.S. Environmental Protection Agency’s (EPA) Clean Air Markets Division after ceasing operation of BCP. PGE will submit a Retired Unit Exemption form to EPA in the first quarter of 2021.

2.2.2.4 Radioactive Materials

Boardman’s coal monitoring equipment includes a total of 56 fixed gauge radioactive sources, which are permitted under an Oregon Radioactive Materials License (ORE-90735). To prevent exposure, the covered equipment must be removed before most other decommissioning activities begin. The contractor selected to remove, package and ship or transfer the sources will be permitted by the State of Oregon. Once all radioactive sources are removed and the ownership transferred, the Radioactive Materials License (RML) will be terminated. There is no published guidance available on termination of an RML; PGE will work with the Oregon Health Authority (OHA) to identify the process for terminating the license and any other associated requirements.

In addition to the fixed gauge radioactive sources licensed under the RML, Boardman has a hand-held x-ray fluorescence device (XRF), which is registered with the OHA under a portable gauge license. At the end of operations, the XRF license must either be transferred to another facility, or the device returned to the manufacturer and the license terminated.

2.2.2.5 Underground Storage Tanks

Boardman currently operates two fiberglass USTs for diesel and gasoline fuel, permitted by DEQ (25-833). Tanks will be decommissioned by closure in place or removal in accordance with DEQ requirements.

2.2.2.6 Domestic Water System

BCP and CGS share a domestic water system registration with the Oregon Department of Water Services (State ID # 90513). Use of the domestic water system by CGS will continue after decommissioning.

2.2.3 Compliance Programs

In addition to the permit-related programs listed above, there are several compliance programs with requirements for management through decommissioning. These programs include the Coal Combustion Residuals (CCR) Rule, the Spill Prevention, Control, and Countermeasure (SPCC) Rule under the Oil Pollution Prevention Program, the Toxics Release Inventory (TRI) Program mandated by the Emergency Planning and Community Right-to-Know Act, the Hazardous Substation Information Program under the Oregon Community Right-to-Know and Protection Act, and hazardous and toxic waste management compliance under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA).

2.2.3.1 Coal Combustion Residuals

The Boardman ash disposal area is regulated by the EPA's CCR Rule, a self-implementing program under RCRA. Operations, maintenance, monitoring, and closure of the disposal area must all be conducted in compliance with the Rule. In accordance with the CCR Rule, PGE has a Closure Plan and a Post-Closure Plan prepared and publicly available. Disposal area closure will be completed in accordance with the Closure Plan and CCR Rule requirements, beginning with an evaluation of final cover system approaches and determination of potential beneficial reuse. The Closure and Post-closure plans will be updated as necessary following the cover system evaluation. EPA is currently working on a Federal CCR permit program rule, the public comment period ended in July 2020; once that rule is promulgated PGE will obtain any required Federal permit for the long-term monitoring of the ash disposal area.

2.2.3.2 Oil Spill Prevention, Control and Countermeasure

The BCP oil SPCC program is voluntary, based on PGE's assessment of oil spill risk and not on regulatory requirements. As a result, closure and decommissioning of BCP is not subject to regulatory deadlines to update the Plan based on changing site conditions. If oil handling processes do not change significantly, iterative updates to Boardman's SPCC during decommissioning will not be needed because there will be no increase in risk. During decommissioning, the site must continue to follow the provisions of the existing SPCC plan for any oil storage remaining on site and use proper containment for all oil-related activities. Decommissioning activities involving oil products should incorporate SPCC best management practices. If oil storage capacity is expected to increase during decommissioning, the process should be evaluated and documented in advance. The inspection schedules in the Plan should also be re-evaluated to ensure inspections based on routine use of equipment will be sufficient for decommissioning activities.

2.2.3.3 Toxics Release Inventory

As a facility that combusts coal to generate power for distribution into commerce, Boardman uses various chemicals above EPA reporting thresholds, requiring reporting of chemical usage annually to the EPA's TRI. The 2020 report will be PGE's final report, in which closure and decommissioning of the facility will be noted.

2.2.3.4 Hazardous Substation Information Program

BCP is required to submit annual Hazardous Substation Information surveys to the Oregon Office of the State Fire Marshal (OSFM). In addition to continued annual surveys, substantive changes to chemical storage locations and volumes during and after decommissioning will require submission of an updated survey to the OSFM within 30 days of the change. PGE will work with the OSFM to identify an appropriate update schedule for the decommissioning phase of the project.

2.2.3.5 Hazardous and Toxic Waste Management

Operation of Boardman generates small amounts of wastes regulated by RCRA and TSCA, including various characteristic wastes, polychlorinated biphenyl (PCB) contaminated materials, and ACM. The site will continue to properly manage hazardous and toxic waste through D&D, in accordance with RCRA and TSCA. Decommissioning may result in unused products being disposed of as hazardous waste; special attention will be paid to the volume of RCRA waste generated during decommissioning and the resulting compliance requirements based on generator size. Effort will also be made to work down product storage levels during 2020 to minimize the amount of unused product remaining at the end of operations. Waste generated during the closure process will be disposed of under the Boardman RCRA ID (ORD088592233).

2.2.3.6 Asbestos Abatement Notification

The contractor will need to submit two notifications related to asbestos abatement: one to DEQ and one to Oregon's Occupational Safety and Health Administration (OSHA). Both agencies require a 10-day notification period prior to the start of abatement. The DEQ notification should include both asbestos abatement and demolition.

2.3 Planning Documents

The following are documents used during the planning phase. This is not a comprehensive list but rather identifies the most current documents:

- Carty-Boardman Utility Isolation Memos (Potable Water, Fire Water, Sewage, and Raw Water)
- Updated Boardman D&D Plan and updated cost estimate
- RFP Budget Proposal documents for contractor bid pricing. These documents were prepared by AECOM and the resulting bid submittals were solicited from contractors by AECOM independently of PGE
- Ash disposal area cap options analysis

2.4 Sequencing of Work

Project work will be performed in a sequenced manner with emphasis on safety, quality, efficiency, effectiveness, and protection of the environment. The entire demolition process must be organized and coordinated precisely to ensure these considerations. For the purpose of this Decommissioning and Demolition Plan and ROM cost estimate, it is assumed that the first sequence of tasks will be to obtain all permits necessary to perform the demolition and establish work and demolition lay-down areas.

Once permits are obtained, the plant will be prepared for demolition by removing hazardous materials and salvage materials. PGE will purge all systems. In the next sequence, demolition of all remaining structures will occur. Following demolition, the next sequence will encompass transport and disposal of waste, recycled materials, and salvaged equipment. The final sequence will consist of final grading and site restoration. The actual demolition sequence may differ depending on the demolition contractor or demolition program manager selected by PGE.

A comprehensive RFP package (or set of packages) needs to be assembled and distributed to prequalified bidders. Upon contract award and with all permits in place, the following tasks will be completed in a generalized conceptual sequence:

- Verify that decommissioning and plant shutdown has occurred.
- Establish stormwater controls.
- Remove any residual waste (non-hazardous and hazardous) from tanks, vessels, equipment, and from spills.
- Perform asbestos and LCP abatement and stabilization, except where abatement of siding and gaskets happens concurrently with demolition activities.
- Remove residual coal from coal yard and dispose of offsite.
- Demolish/dismantle/abate facilities and structures identified for demolition.
- Clean wastewater ponds and discharge channel.
- Crush concrete for use as backfill.
- Abandon underground utilities to -2 feet BG (except stormwater systems). Cap all piping and conduits left in place.
- Abandon utility trenching and associated piping. Cut and cap lines.
- Complete backfill and grading of the site using onsite soils and crushed concrete.
- Complete site restoration including remaining environmental remediation.

3. Pre-Demolition Activities

The pre-demolition execution activities for the BCP D&D consist of engineering and construction of CGS support system isolation; performance of an ERM survey; cold and dark implementation; decontamination; abatement and asset recovery; waste characterization, handling, transportation, and disposal planning; and recycled material handling, transportation, and planning. It is anticipated that these activities will occur between January 2019 and December 2020.

3.1 Engineering and Construction of CGS Support System Isolation

Before the BCP goes cold and dark, several key systems that currently support the CGS through the BCP will need to be isolated. The process for isolation will include preparing the engineering plans and an engineering estimate, obtaining funding, soliciting services and contracting, and completing the construction elements. The engineering plans for the CGS isolation will be completed in 2019 and 2020, and will include the design plans, specifications, and engineering cost estimate. The design will include all elements required to isolate the CGS from the existing systems of the BCP.

The CGS isolation must consider the following:

- Electrical for buildings at the Boardman site which will remain to support Carty currently is obtained through the Boardman power block. Boardman's switch yard will be expanded to serve these loads and provide back-up power to Carty and will be renamed Carty Substation.
- Communication microwaves need to be relocated.
- Service water needs to be maintained.
- Existing ponds will be used for sewage or a septic system will be installed.
- Domestic water will be maintained upstream of Boardman and controls will be transferred to Carty.
- CGS circulation water pipes will be protected during demolition.

3.2 Performance of ERM Survey

A demolition design-level survey for ERM was conducted by AECOM in Q3-Q4 2019. The ERM survey supplements the previous ERM surveys conducted in 2006 and 2017. The design-level ERM survey was conducted by properly accredited personnel including Asbestos Hazard Emergency Response Act (AHERA)-accredited building inspectors and Oregon-licensed lead inspectors. The design-level ERM survey aimed to identify and quantify the following ERM materials:

- ACM
- Universal waste (mercury tubes, switches, thermostats, radioactive sources)
- LCP
- PCB in bulk materials
- Refrigerants
- Hazardous waste
- Radiological waste

AECOM performed an assessment for LCP using a combination of an X-ray diffraction analyzer and confirmation paint chip sampling. Demolition work impacting lead-containing materials (at any detectable levels) triggers the Oregon OSHA Lead in Construction Code. LCP does not need to be removed prior to demolition but engineering controls must be used to reduce worker exposures and prevent releases to the environment. AECOM's LCP sampling also identified those areas of LCP in poor condition that may require stabilization (removal or encapsulation) prior to building demolition. The anticipated LCP waste generated as part of the stabilization will be classified as a hazardous waste and the design work will minimize the generation of hazardous lead waste.

The ERM design survey identified lead on some roof vent coverings. The focus was on painted materials that require waste characterization for demolition and disposal. Metal components with LCP are typically recycled during demolition and material segregation operations. Painted components that may end up in an offsite landfill and not recycled will be sampled unless previous reporting indicates the presence of lead.

AECOM prepared a written report documenting the findings of the additional investigation with an estimate of quantities. The ERM report also identifies areas which could not be accessed for destructive testing and will require evaluation after plant closure. Based on this information, the abatement design documents will be prepared.

3.2.1 Summarized Results

The following are the summarized results of AECOM's ERM Survey:

- No PCB-containing building materials were identified.
- TENORM screening indicated no readings with detectable radioactivity.
- ACMs and assumed ACM were identified in the majority of the site structures. See summarized Table 3-1.
- LCP was identified in many of the structures. One hundred and fifty-seven paint chip samples were collected and analyzed for total lead content; 62 of the paint chip samples were found to contain detectable levels of lead. AECOM collected 336 XRF readings and of those, 57 readings had detectable levels of lead. The LCP was in good condition with minor flaking or peeling. The majority of the concrete onsite is unpainted.
- Universal wastes were identified in the majority of buildings. See summarized Table 3-2.

Table 3-1: Summarized ACM Information

Material	Location	Quantity	Unit
Asphaltic coating on corrugated metal siding	Ash Unloading Area	28,580	SF
Asphaltic coating on corrugated metal siding	Coal Conveyance System	43,430	SF
Asphaltic coating on corrugated metal siding	Crusher Building	34,000	SF
Asphaltic coating on corrugated metal siding	Dumper Building	11,800	SF
Asphaltic coating on corrugated metal siding	Powerblock	355,000	SF
Asphaltic coating on corrugated metal siding	Thaw Shed	29,200	SF
Asphaltic coating on corrugated metal siding	Transfer Point 1	3,588	SF
Asphaltic coating on corrugated metal siding	Transfer Point 2	9,970	SF
Asphaltic coating on corrugated metal siding	Transfer Point 3	7,040	SF
Asphaltic coating on corrugated metal siding	Transfer Point 4	6,224	SF
Asphaltic coating on corrugated metal siding	Transfer Point 5	8,946	SF
Gaskets	Throughout	5,000	EA
Assumed asbestos-containing roofing/ Power Block	Power block roofs	77,250	SF
Assumed asbestos-containing roofing/Admin Building (under membrane roofing)	Admin building	36,300	SF
Assumed asbestos-containing roofing/Yard Control Roof	Yard Control	1,600	SF
Asphaltic roofing with silver coating on sheds	Sheds on north end of coal yard	400	SF
Electrical panel backing	Throughout	500	EA
Door caulking (interior and exterior caulking)	Powerblock doors throughout	217	EA
Various caulking throughout (not including the caulking related to the asphaltic coating on the corrugated metal siding)	Throughout	200	LF
Assumed fire doors throughout	Throughout	350	EA
Textured coating on roofing fan units	Power block roofs	6,240	SF
Joint compound and gypsum	Guard shacks and multi-purpose building	10,700	SF
Mirror mastic	Admin Building	4	EA
Sealants and caulking on Precipitator Roof	Precipitator	Not accessible	
Pin mastic	Admin Building and Stacker/Reclaimers	2,280	SF
Interior and exterior seam caulking	Oil Storage shed, shed 1 (two sheds), and shed 2	2,400	LF
Vibration isolators	Throughout	100	EA
Vinyl floor tile and mastic	Admin building, dumper building, and yard control building	3,200	SF
Black exterior window caulking	Admin building	1,270	LF
2"x2" and 4"x4" white ceramic tile and associated grout and mastic	Admin building	800	SF

Table 3-2: Summarized Universal Waste Information

Component	Totals	Unit
Mercury-containing light tubes (4')	4,591	EA
Mercury-containing compact fluorescent lights	29	EA
Light Ballasts	4,627	EA
HID Lights (high pressure sodium and halide)	2,331	EA
Emergency (incandescent flood)	525	EA
Strobe (LED strobe)	49	EA
LED Lights	147	EA
Other light fixtures	25	EA
Mercury-containing switches	28	EA
Mercury-containing thermostats	34	EA
Mercury-containing pressure gages	779	EA
Batteries	9	EA
Refrigerants	71	EA
HVAC Units	63	EA
Self-luminescent fire exit signs	77	EA
Nuclear gages	53	EA
Smoke Detectors	63	EA
Identified Oil-filled transformers with PCB concentrations	8	EA

3.3 Decontamination/Decommissioning

Decontamination of the buildings, structures, and systems will occur prior to demolition. A decontamination plan will include a detailed description of the decontamination work to be conducted, along with a description of the methods and procedures to be employed.

Specific elements of the decontamination plan will address methodology and procedures, site preparation, required containment setup, engineering and work practice controls, personal protective equipment (PPE), waste labeling, waste storage/containerization, waste transport/disposal, personnel decontamination, and cleanup.

The decontamination will include the removal of all remaining liquids, gas, and solids from piping, tanks, vessels, equipment, and components. Decontamination will involve accessing the components by cutting, opening, etc. to allow the liquid, gas, and solids to be removed. This process requires careful planning and execution. Residual waste will be handled, stored, transported, and disposed of in accordance with local, state, and federal regulations. Typical procedures for the abatement of existing facilities are listed below.

Cold methods will be used for “first-breaks” and creating “air-gaps” on equipment such as pipes, enclosed vessels, and tanks. PGE will complete this work in advance of turning the plant over to the demolition contractor. PGE plant staff performing this work is advantageous to the project because of system knowledge, which increases the safety and thoroughness of the work. Additionally, using plant staff may reduce costs. If any of this work is performed by the demolition contractor, PGE plant staff should oversee the work to ensure all systems are air gapped.

Plumbing, electrical, and other utilities will be disconnected, capped, or cut prior to decontamination as required to safely perform the work.

Engineering will be completed as necessary to ensure any equipment and piping removed from the power plant structure as part of the decontamination is adequately supported and restrained during demolition in a manner that meets all applicable codes and requirements.

Any pits, tunnels, and trenches within and adjacent to the turbine and boilers will be opened, cleaned, and made safe with the replacement of removed or repaired deck plates or handrails as appropriate. Material removed from the pits and trenches will be disposed of in accordance with all applicable laws.

Special care will be taken to decontaminate the ash silo. The ash silo is currently full of ash, which is flowable.

3.3.1 Soil Remediation

Nine areas of potential soil contamination were identified. These areas were sampled in 2017 for various contaminants of concern. Of the nine areas, four were identified for additional investigation or soil removal. The four areas are the shooting range berm, auto repair shop, coolant leak area, and east industrial waste pile. This section describes these areas and the proposed mitigation. The areas are shown on Figure 1-10 Environmental DUs (G-208).

3.3.1.1 Shooting Range Berm

The shooting range is located along the west side of a soil stockpile created from excavation of the evaporation pond. This area has been used intermittently over time, very little in the last decade and not in the last five years. Material is impacted with lead from bullet rounds. As a mitigation measure, this material will be resampled using Incremental Sampling Methodology (ISM) and impacted soil will be removed and disposed of at an approved offsite disposal facility.

3.3.1.2 Auto Repair Shop

There is documentation of an oil spill at the auto repair shop that was previously cleaned up. Solids collected above the liner of the wash water ponds will be removed for appropriate disposal; soil staining was also observed at the auto wash rack. After removal of the solids from the wash water pond and the liner, the soil beneath the liner will be sampled to ensure no residual contamination is present. The excavated area will be graded or backfilled with clean soil and graded to match existing adjacent grades.

3.3.1.3 Coolant Leak Area

Benzo(a)pyrene was detected in soil samples exceeding occupational risk-based concentrations. Additional sampling and soil removal will be performed. The excavated soil will be disposed of at an offsite approved disposal facility. The excavated area will be graded or backfilled with clean soil and graded to match existing adjacent grades.

3.3.1.4 East Industrial Waste Pile

Petroleum hydrocarbons were detected in the soil pile, warranting additional sampling. If additional sampling finds concentrations above risk-based screening levels, the soil will be excavated and disposed of at an offsite approved disposal facility. The excavated area will be graded or backfilled with clean soil and graded to match existing adjacent grades.

3.4 Cold and Dark Implementation

The planned activities for making the BCP cold, dark, dry, and safe generally include the identification of systems, equipment, and machines that will be deactivated, drained of oils, solvents and fluids, and decommissioned. PGE and AECOM will decide which systems and equipment will be put on the cold, dark, and dry list. PGE will perform the decommissioning activities once the plant ceases operations. Specific tasks will be performed by outside contractors such as emptying and cleaning tanks and radiological source removal and disposal. It is anticipated that decommissioning and making the plant cold, dark and dry will take three to nine months depending on the timing of the Boardman Carty Separation.

3.5 Waste Characterization, Handling, Transportation, and Disposal

Waste generated during the demolition of the BCP is anticipated to fall into one of the following waste categories:

- Non-hazardous construction debris
- Universal waste
- Non-RCRA hazardous
- RCRA hazardous
- TSCA regulated material
- Radiological

Waste will be hauled by truck or train from the site to the appropriate disposal facility. Trucks will enter and leave the site from the main gate. Trains will enter and leave on the rail spur that enters the BCP. The trucks will be loaded at the site either from temporary stockpiles or directly from the demolition activities. Water spraying may be implemented to suppress potential dust while loading. Trucks will be covered with tarps prior to leaving the site.

Prior to offsite disposal of any waste, a waste approval package for each waste stream will be prepared. This package will include a waste profile identifying the generator of the waste, analytical summary table(s) applicable to the waste, land disposal restrictions notification for any hazardous waste, a completed waste manifest, and any other applicable information necessary for PGE to complete its review of the disposal package and signature as the generator. The signed profile will then be submitted to the offsite facility for acceptance and approval. Once the approval letter is received from the offsite facility, transportation can be scheduled. Each load of waste material will be manifested prior to leaving the site.

The generator and the transporter must sign the manifest prior to the load of waste leaving the site. A copy of the manifest will be retained onsite for tracking purposes. The original signed manifest will be returned to the address of the generator. The Traffic Control Plan (TCP) will identify transport routes and times for the materials.

3.5.1 Clean Construction and Demolition Debris

An estimated 2,000 cubic yards of C&D debris will be generated as part of the demolition activities. All waste that cannot be used onsite may be transported to and disposed of at a permitted landfill facility.

3.5.2 Non-RCRA Hazardous Waste

Every attempt will be made to recycle or repurpose material during the decommissioning process. For materials that cannot be reused, they will be managed as a waste. Non-RCRA hazardous waste includes the waste identified under the RCRA in 40 CFR 261, Subparts C and D. Non-RCRA hazardous waste generated during the demolition activities may include asbestos, refractory waste, soil, and other waste identified during the demolition. This waste will be disposed of at a permitted landfill facility.

3.5.3 RCRA Hazardous Waste

RCRA hazardous waste generated during the demolition activities may include LCP chips, lead waste from paint stripping activities, and lead removed from batteries (non-universal waste batteries). This waste will be disposed of at a permitted landfill facility.

3.5.4 Universal Wastes and Other Hazardous Waste

The following types of universal waste may be generated during the BCP demolition activities:

- Batteries containing nickel-cadmium and small, sealed, lead-acid batteries that are found in many common business/household items, such as those used in electronic equipment, mobile telephones, portable computers, and emergency backup lighting.
- Mercury-containing equipment, including devices or parts of devices that contains elemental mercury integral to its function (e.g., thermostats, switches, and pressure or vacuum gauges).
- Lamps, including fluorescent tubes and bulbs, high-intensity discharge lamps, sodium vapor lamps, and any other type of lamp that exhibits a characteristic of hazardous waste. Any electric lamp that contains added mercury, whether it exhibits a hazardous waste characteristic or not, is considered a universal waste.
- Universal waste must be shipped to a "destination facility" that treats, disposes of, or recycles a category of universal waste in compliance with the applicable universal waste requirements of Oregon.

3.5.5 Radioactive Waste

Boardman's coal monitoring equipment includes a total of 56 fixed-gauge radioactive sources, which are permitted under an Oregon RML (ORE-90735). These sources are located at multiple locations throughout BCP, including but not limited to the feeders, crusher building, distribution bins, transfer points, coal dust collectors, lower well, reclaim pits, dumper pit, and belt conveyor and feeder. All radioactive sources will be returned to their manufacturer. If the manufacturer cannot be located, the sources will be securely containerized and disposed of using a specialty waste disposal service.

3.5.6 TSCA-regulated Materials

Any light ballast identified as "PCB-containing," ballast without a label, or ballast that contains a leaking capacitor will be disposed of offsite as PCB bulk product waste:

- In an incinerator approved under the TSCA

- In a chemical waste landfill approved under TSCA
- In an RCRA permitted hazardous waste landfill

3.6 Abatement and Asset Recovery Process

ERM abatement activities will include pre-demolition abatement and abatement during demolition. The work will be performed by appropriately licensed and qualified contractors. As part of the abatement design, qualifications of the abatement contractors will be requested. Abatement contractors will go through a pre-qualification screening and then will be invited to bid on the work. The abatement work will be detailed in the Project Demolition and Abatement Project design prepared by AECOM. The ACM is identified in AECOM's ERM Survey for the Boardman Plant.

3.6.1.1 Abatement Design

The abatement design will be performance-based, requiring abatement contractors to prepare and submit a detailed work plan for each of the project areas. In addition to pre-bid work plan submittals, the abatement contractor will prepare abatement plans prior to the initiation of activities. These plans will include a detailed description of the abatement work to be conducted, along with a description of the abatement methods and procedures to be employed.

Specific elements of the abatement plans will address certifications/training requirements, methodology and procedures, site preparation, required containment setup, engineering and work practice controls, PPE, worker exposure assessment (air monitoring), waste labeling, waste storage/containerization, waste transport/disposal, personnel decontamination, worker hygiene facilities, and general housekeeping and clean-up.

The abatement design documents will:

- Be prepared by an AHERA-accredited project designer.
- Include technical specifications outlining submittal requirements, training and certifications, air monitoring, engineering controls, removal, packaging, waste disposal, clearance, and recordkeeping.
- Identify materials for removal, repair, and/or stabilization.

3.6.1.2 ERM Management Plan

During the design-level ERM survey, destructive sampling will be performed in buildings slated for demolition. In the remaining buildings, the ERM survey will focus on the suspect materials requiring labeling under OSHA and necessary maintenance remaining ACM onsite. Suspect materials requiring destructive sampling which could alter the integrity of the system will be assumed to contain asbestos and/or lead.

Following the completion of the design-level ERM survey, ACMs in buildings and structures slated for demolition will be removed by a DEQ licensed asbestos abatement contractor. Current site knowledge suggests that the most significant ACM identified is the exterior siding, roofing, and undercarriage of buildings/structures. As such, demolition will require close coordination with abatement.

Specifications for stripping, removal, and disposal portions of the abatement work will conform to the current regulatory standards and the procedures determined during the planning and design phases. Typical procedures for asbestos abatement are listed below in Table 3-3.

Table 3-3: ACM Identification and General Removal Procedures

ACM Type	National Emission Standards for Hazardous Air Pollutants Category	OSHA Classification	Engineering Controls
Vinyl floor tile and mastic	Cat. 1 non-friable (NF)	Class II	Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal
Asphaltic siding ("Galbestos")	Cat. 2 NF	Class II	Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal
Valve and flange gaskets	Cat. 1 NF	Class II	Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal
Joint compound and wallboard	Regulated ACM (RACM)	Class II non-intact	Negative pressure enclosure (NPE), Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal

ACM Type	National Emission Standards for Hazardous Air Pollutants Category	OSHA Classification	Engineering Controls
Paper backing associated with vinyl floor sheeting	RACM	Class II non-intact	NPE, Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal
Window caulking and glazing compounds	Cat. 2 NF	Class II	Regulated Area, demarcation tape, critical barriers, wet removal, prompt waste packaging and disposal
NF: non-friable, RACM: regulated ACM			

When mechanical means are used to remove ACM, Regulated Areas will be demarcated using barrier tape and required asbestos signage and critical barriers consisting of 6-mil polyethylene (poly) sheeting installed over openings, doors/entrances, walls, and ceiling. For Class I, Class II non-intact, and RACM abatement, negative air machines will be installed and exhausted to the building exterior, creating an NPE. All workers inside Regulated Areas will wear appropriate PPE.

Removal of all ACM will be performed using manual means and wet methods. Removed ACM will be placed into 6-mil poly bags, which will then be sealed and labeled in 6-mil poly asbestos bags. Airless sprayers or other wetting devices will be used to keep materials adequately wet during the removal process. Asbestos-containing mastic will be removed with floor buffers, bead-blasters, or razor scrapers and owner-approved mastic remover. If floor buffers or bead-blasters are used, the work will be performed in an NPE. Removed exterior panels and associated washers will be packaged in two-layers of 6-mil poly with asbestos labels. The abatement contractor will be responsible for packaging the ACM panels in a manner acceptable with the disposal site. OSHA and DEQ air monitoring will be performed throughout abatement activities.

Regulated Work Areas for the RACM/Class I and Class II non-intact ACM will be demarcated using barrier tape and required asbestos signage. The 6-mil poly sheeting will be placed over openings, doors/entrances, walls, and floors, prior to removal. Negative air machines will be installed and exhausted to the building exterior, creating an NPE. Using manual means and wet methods, ACM will be placed into pre-labeled, 6-mil poly bags, sealed, double-bagged, and properly labeled, including EPA identification number(s). After material has been removed, the substrate will be detail-cleaned to remove any residual ACM, and surfaces will then be encapsulated. OSHA and DEQ air monitoring will be performed throughout abatement activities.

Each Regulated Work Area for friable thermal system insulation (TSI) will be demarcated using barrier tape and required asbestos signage. The poly sheeting will be placed over openings, doors/entrances, walls, and floors, prior to removal. Negative air machines will be installed and exhausted to building exteriors, creating a localized Negative Air, or the NPE. Using manual means and wet methods, TSI will be "glove-bagged" over drop-cloth poly. Boiler/tank insulation removal will be completed via gross removal inside the containment area. ACM will be placed into pre-labeled, 6-mil poly bags, sealed, double-bagged, and properly labeled, including EPA identification numbers. After material is removed, the substrate will be detail-cleaned to remove any residual ACM, and surfaces will be encapsulated. Workers will wear the appropriate PPE and OSHA Personnel Exposure Air Monitoring will be performed throughout removal and detail-cleaning.

Work areas will be demarcated via barrier tape and required signage for ACM reported to contain less than 1 percent asbestos, which includes interior drywall walls, window putty, and ceiling tile mastic. Walls will be removed via mechanical means and poly sheeting drop cloths may be placed below ACM, for the drywall removal using wet methods, before placing into bags or directly into a poly-lined construction debris bin. As necessary, high-efficiency particulate air (HEPA) vacuums will be used to detail clean areas. Workers will wear the appropriate PPE and OSHA Personnel Exposure Air Monitoring will be performed throughout removal and detail-cleaning.

ACM roofing and siding will be manually removed, then bagged or lowered to the ground via enclosed chutes. Roof penetration mastic and all materials will be kept adequately wet while being abated. An enclosed chute may be erected to allow for bulk removal of roofing, loaded directly into open-top bins lined with poly sheeting. Final cleaning will be accomplished by wetting/misting any remaining material, prior to placing directly into single, clear poly bags. As necessary, HEPA vacuums will be used to final clean and detail the roof substrate. OSHA Personnel Exposure Air Monitoring will be performed during the abatement. A 5-point safety harness with lanyard(s) will be used by each worker during elevated work, and the fall protection system and equipment to be used will comply with OSHA requirements.

3.6.2 Lead-Containing Paint

During the design-level ERM survey, paints and coatings will be screened utilizing an XRF and bulk sampling for laboratory analysis. Any detectable level of lead triggers the OSHA lead in construction code. Depending on the demolition activities, some paint chip samples may also be analyzed for other heavy metals with vertical standards such as chromium, arsenic, and mercury. In the required Contractor Work Plan, heavy metals will be addressed including training, administrative controls, engineering controls, and disposal/recycling. Contractors will be fully responsible for compliance with all applicable standards.

Surface coatings will be tested either by an X-ray fluorescence process, or through sampling and laboratory analysis. Flaking or peeling LCP will be removed or encapsulated prior to demolition. The waste product generated during removal will be collected, containerized, and transported offsite for disposal. Should flame cutting or welding be required on surfaces coated with LCP, the LCP will be removed beforehand using appropriate safety measures. Debris from lead stabilization activities are likely to be considered hazardous waste. Specifications for the removal and stabilization of LCP will identify hazardous waste minimization procedures.

It is assumed that demolition debris that contains firmly adhered LCP (e.g., concrete debris with LCP) will not be a hazardous waste and will be managed as nonhazardous debris.

Regulated Work Areas will be established prior to the removal of damaged LCP materials, which will be demarcated using barrier tape and required Lead-Danger signage. Poly sheeting will be placed under surfaces adjacent to damaged LCP, which will be removed via manual means and wet methods. Upon completion of removal, the substrate will be thoroughly encapsulated with an owner-approved encapsulant to stabilize the existing surface(s) prior to building demolition. Workers will wear appropriate PPE and OSHA Personnel Exposure Monitoring will be performed during the work.

All packaged material will be taken directly from the load-out area to poly-lined bins. The LCP will be transported as waste under manifest to federal and state-approved facilities. The generator's copy of the manifest will be provided to the designated point of contact. Throughout the project, a waste manifest log will be maintained. Upon completion of work, manifests will become a part of a final closeout report.

3.6.3 Universal Wastes and Other Hazardous Wastes

Located throughout the BCP are various building components that are regulated under the EPA Title 40 *Code of Federal Regulations* (CFR). The contractor will be responsible for the removal, packing, and disposal/recycling of universal waste in the buildings slated for demolition. For remaining buildings, universal waste will only be removed if it is no longer essential for safe maintenance of the building. The following protocols (3.5.3.1 – 3.5.3.9) provide typical means and methods of handling such materials as part of the abatement and demolition activities.

3.6.3.1 Mercury-Containing Items

Items containing mercury will be isolated and wires clipped, or housing dismantled. Glass ampoules will be removed and then placed in spill-proof plastic containers containing absorbent media. When personnel have removed all mercury-containing items from the facility, the remaining void space in the container will be filled with absorbent. The lid will then be secured, and the drum labeled with the generator information and proper shipping name. The mercury waste stream will be staged for eventual transportation and disposal to an owner-approved disposal facility. Mercury waste will be labeled with a standard "HAZARDOUS WASTE" label, with the description of "Mercury Contained in Manufactured Articles, 8, UN2809, P.G.III, (Mercury)." This labeling and manifest description will be required for any shipment of mercury waste.

3.6.3.2 Refrigerant Removal

The specific items (e.g., air conditioning units) in structures identified for demolition that contain chlorofluorocarbons will be located and accessed for recovery. A licensed EPA Refrigeration Technician will perform any evacuation activities, confirm evacuation has been completed, and leave valves open to signify that recovery has been completed. Refrigerant recovery and recycling documentation will be provided to the owner.

3.6.3.3 Self-Luminous Exit Signs

For structures that will be demolished, self-luminous self-power lighting exit signs will be removed and packaged per the manufacturer's recommendation. The units will be unbolted from the wall. No attempt will be made to open the body of the exit sign and precautions will be taken by personnel to ensure that the sign is not dropped. Removed exit signs will be placed into manufacture-provided boxes suitable for the shipping of the devices. The boxes will contain up to approximately 10 devices. Each device will be placed into a sealable plastic bag as recommended by the manufacturer. Shipment of these devices will involve the acquisition of a Return Material Authorization (RMA) number provided by the manufacturers. This RMA number will be considered the acceptance and tracking number by the

manufacturer. If the manufacturer cannot be located, the exit signs will be securely containerized and disposed of using a specialty waste disposal service.

3.6.3.4 Smoke Detector Removal

As with the self-luminous exit signs, the smoke detectors to be removed will be packaged per the manufacturer's recommendations. The removed smoke detectors will be placed into manufacturer-provided boxes suitable for shipping. The box will contain approximately 35 to 40 devices. Each device will be placed into a sealable plastic bag as recommended by the manufacturer. Shipment of these devices will involve the acquisition of an RMA number provided by the manufacturer. This RMA number will be considered the acceptance and tracking number by the manufacturer. Similarly, should the manufacturer not be available, the abatement contractor will utilize a specialty waste disposal service to properly dispose of smoke detectors.

3.6.3.5 Lead Acid/NiCad Batteries

Any batteries to be removed will be located and the housing cover opened for access. The removed batteries will be staged at the temporary waste storage area for segregation and packaging. Packaging will consist of placement of the undamaged batteries onto wooden pallets. If a battery is found to be cracked, leaking, or if the integrity of the battery is potentially impaired, it will be containerized in designated poly drums or containers at the temporary waste storage area, for eventual consolidation and shipment offsite. All drums will be packaged and labeled according to state or federal requirements. All personnel handling lead acid batteries will be outfitted with appropriate safety gear including but not limited to chemical-resistant polyvinyl chloride (PVC) knee boots, PVC Tyvek Suits, PVC gloves, and hard-hats with goggles and face shield. Any spills will be neutralized with baking soda and water or other approved procedures.

3.6.3.6 Fluorescent Bulbs and HID Lamps

Rolling scaffolding or ladders will be used to support workers on single-story floors. For ceilings of greater height, a motorized lift will be utilized to assist in retrieving light tubes and other lighting fixtures. The tubes and lamps will be removed and placed in Transport, Storage, and Disposal Facility-supplied storage boxes or fiber drums. The box/drum will be sealed, placed on a pallet, and secured with stretch wrap. Full pallets will be transported via forklift to the temporary waste storage area. Boxes will be marked with the customer name and address, and a packing list will be attached to the container. During fluorescent light removal, if any tubes break, personnel will gather the broken items and place them in a plastic container. Plastic containers will then be consolidated in a Department of Transportation (DOT) 17H, 55-gallon steel drum and properly profiled per federal or state regulations.

3.6.3.7 PCB and Non-PCB Ballasts

Lighting ballasts will be removed and containerized for offsite recycling. Although non-PCB containing ballasts can be considered general construction debris, each ballast contains a small amount of dielectric fluid. The fluid is non-PCB containing but should be managed properly through recycling and not shipped to a local landfill as debris. Ballasts will be removed by unbolting the item from the light fixture housing and consolidated in a DOT 17H, 55-gallon steel drum(s). When counting ballasts during lab packing, care should be taken to ensure that no more than 150 small ballasts are placed into a 55-gallon drum. All lab packing will occur in accordance with federal, state, and local regulations. Ballasts will be staged for eventual offsite recycling at an owner-approved disposal facility.

Drums containing PCB ballasts will be labeled with a standard "HAZARDOUS WASTE" label, and the description of "R.Q. Environmentally Hazardous Substance Solid, N.O.S., 9, NA3077, P.G.III, (Polychlorinated Biphenyls)" and "CAUTION CONTAINS PCBs." This labeling and manifest description will be required for any shipment of drummed PCB-containing ballasts. PCB-containing light ballasts may be transported to an owner-approved recycler/disposal facility for lights. Proper bills of lading and other documentation will be provided to the owner.

3.6.3.8 Oil-containing Equipment

Oil-containing equipment may include any equipment known to have previously contained hydraulic motor or cooling oil. Equipment to be addressed may include but is not limited to the following:

- Elevators
- Electric motors on conveyors
- Pumps
- Diesel-operated compressors and generators
- Transformers

Elevators in buildings to remain will not be decommissioned. Elevators and other vertical conveyance systems in buildings/structures slated for demolition will have the hydraulic fluid currently contained in the elevator's holding tank, turbine controls, and other equipment, removed. Personnel will utilize mechanical (metal or plastic) hand pumps to facilitate oil removal. The oil will be pumped directly into the DOT 17H, 55-gallon steel drum(s), which will be located adjacent to the work area during oil transfer to reduce spillage. Containers will be sealed prior to being moved or

transported. Absorbent and/or spill containment booms will be available onsite during oil removal and transfer as a contingency in case of spillage. Drummed hydraulic fluid will be profiled and recycled at a PGE-approved recycling facility.

Similarly, other equipment containing hydraulic or motor oil will be drained and properly disposed of or recycled prior to facility demolition. Electrical transformers located in the project area will be sampled to assure they are non-PCB.

3.6.3.9 Radiation Sources

A total of 56 radioactive material sources are located at the BCP, including radioactive materials in the form of Cesium 137 sealed sources used at the BCP by authority of Oregon Radioactive Material License ORE-90735. (Boardman Fixed Gauges Source Inventory [PGE, 2015]).

These sources are at multiple locations throughout BCP including but not limited to the feeders, crusher building, distribution bins, transfer points, coal dust collectors, lower well, reclaim pits, dumper pit, and belt conveyor and feeder. All radioactive sources will be returned to their manufacturer. If the manufacturer cannot be located, the sources will be securely containerized and disposed of using a specialty waste disposal service.

3.6.4 Asset Recovery

As part of the decommissioning process, unneeded assets will be sold for reuse or for scrap metal where possible. There are several categories of materials, including:

- Heavy Equipment – Caterpillars, loaders and rail cars that can be sold through an auction company
- Major Plant Equipment – Pulverizers and steel structures that will be sold as scrap metal by the demolition contractor with a credit to the overall project demolition cost
- Storeroom Material – Will be sold as scrap metal to interested salvage companies
- Support Structures – Contractor to take care of disposal, with the project receiving credit.
- Office equipment – Will be donated to local non-profit organizations

Equipment that is determined to have a salvage value will be identified and either transferred to another PGE generation site, sold by PGE, or included in the demolition contractor's scope of work. If turned over to the demolition contractor, the contractor will likely either resell whole or sell as scrap. If the equipment cannot be sold, it will be recycled when applicable or disposed of as a nonhazardous or hazardous waste.

The equipment and components that are sold as salvage will be transported offsite through the main gate by truck or by train. The quantities of this material have been estimated as part of the Budget RFP process, but future market values are highly variable and should be verified at the time of salvage.

The following types of equipment may be moved to another PGE site for redeployment or sold as salvage:

- Vehicles and rolling equipment
- Machining equipment
- Pumps and air compressors
- Electrical and control equipment
- Motors
- Transformers

Materials that will be generated during demolition activities and can be recycled include metals from fencing, tanks, support beams, piping, miscellaneous building materials, and electronic and process equipment. Additionally, wood, plastic, electrical components, and other miscellaneous materials may be recycled depending on their economic value. Recycled and salvaged materials will be loaded and secured on trucks or trains from the centralized staging areas. The material will be moved offsite through the main gate and transported to a salvage site.

For the demolition areas, based on Budgetary RFP process, the following materials were identified as having potential salvage value:

- Stainless 304 Grade: approximately 25 tons
- #2 Copper shear wire/tubing: approximately 4 tons
- Scrap metals (#1 Unprepared): approximately 3,700 tons

4. Bidding Documents and Procurement

4.1 Request for Qualifications

As part of beginning the procurement process, PGE will issue a Request for Qualifications (RFQ) to a broad group of contractors. The RFQ will ask for information from contractors on their safety record and program, powerplant demolition experience, project team demolition experience and any other relevant information. The RFQ submittals will be reviewed to identify a short-list of contractors to receive the bid package to provide PGE with a detailed proposal. It is anticipated that the RFQ process will occur in Q3 2020.

4.2 Bid Document Preparation

Detailed drawings and specifications will be prepared for the competitive bid packages. AECOM will prepare bid documents, technical specifications, and site drawings following the Construction Specifications Institute's Masterspec format 2019.

4.2.1 Bid Walks and Bid Support

Once the bid documents are prepared, mandatory site walk-throughs will be scheduled. The site walk-throughs should allow time for all contractors and their sub-contractors to adequately confirm site conditions and planned approach. The bid walks should also be attended by key project staff from PGE and AECOM. AECOM will help PGE evaluate bids received and support contractor interviews.

4.2.2 Construction Submittals

The selected demolition contractor will prepare and submit the plans identified below as parts of the Contractor's Site Work Plan during the pre-construction submittal package. The work plans will be reviewed and approved by PGE and the owner's representative. Approval of submittals does not relieve the contractor from contractual or regulatory requirements. The bid documents and technical specifications will require specific submittal procedures including the use of SharePoint to track submittals, comments, actions, and approvals. During the pre-submittal period, the contractor, owner, and owner's representative will establish clear lines of communication and expectations for the project pre-construction submittals. The focus will be on communication and coordination to efficiently agree on general approaches and technical requirements and minimize the "back and forth" that can occur during submittal reviews.

The Contractor's Site Work Plan will be submitted in electronic format in the prescribed order and properly indexed for easy search and review. There will be an established file naming structure to assist with version control. Based on the size and nature of this project, the submittal process may be managed through SharePoint and does not warrant a third-party submittal management system.

Planning documents will be prepared by the selected demolition contractor as part of the pre-demolition activities for the BCP. These plans will serve as a guide for conducting the demolition in an efficient, effective, and compliant manner. The plans outline the policies and procedures that will be implemented to minimize the impacts to the environment, public, and local community. The plans will provide the procedures for regulatory compliance, as well as means and methods for waste minimization and diversion. The bid documents and technical specifications will outline the submittal requirements and will focus on reducing redundant information where feasible. The primary plan documents are detailed in the following sections.

4.2.2.1 Demolition Work Plan

The Contractor's Demolition Work Plan will serve as the general plan that outlines the demolition activities, procedures, methodology, chronology, and schedule. The work plan will also address project management, personnel, monitoring, and reporting requirements.

All work will be performed in accordance with applicable requirements of the OSHA Construction Industry Standards and PGE's project/site safety requirements. The contractor will provide PGE the opportunity to review and object to any portion of contractor safety programs, abatement and demolition plans, work plans, and other submittals. In addition to other submittals, the contractor will:

- Establish, publish, and enforce a site-specific safety program, in accordance with the D&D specifications, that meets federal, state, and PGE BCP requirements.
- Provide worker orientation, supply and maintain contractor and worker-supplied safety equipment, and have and maintain adequate equipment related to fire protection within work zones.
- Obtain all contractor licenses necessary to perform the subject work in the State of Oregon.

4.2.2.2 Traffic Control Plan

The TCP will address project-specific information for controlling demolition-related vehicular traffic at and near the BCP. The purpose of the TCP is to provide guidelines and procedures for traffic control and flow on and around the BCP while construction activities are in progress. A TCP will have to be in place for demolition, excavation, grading, decontamination, waste hauling, and restoration.

The TCP will discuss the locations of major ingress and egress at the BCP, major onsite and offsite roads that will be used by project personnel vehicles for heavy equipment mobilization and demobilization, and material transportation to and from the BCP. The TCP also discusses traffic routes, major roadways, circulation patterns, and volumes and numbers of various vehicles that are expected at BCP during specific project activities. The TCP will be tailored to meet the threshold requirements specified in the Noise Monitoring Plan (NMP).

4.2.2.3 Site Noise Monitoring Plan

The NMP will address project-specific information for noise control relating to the field activities at the BCP. (Note: Under the Safe Work Plan, the contractor will address worker noise exposure monitoring and protection). The purpose of the NMP is to provide guidelines and procedures for noise control and monitoring on and around the BCP while demolition activities are in progress. Demolition activities will include demolition, abatement, excavation, grading, decontamination, waste treatment, waste hauling, and restoration. The noise performance standards will be included in the bid documents and technical specifications and will include datalogging monitors and portable sound-level meters.

Noise monitoring will be implemented if necessary. If needed, engineering controls might include limiting work during certain hours, days, or months.

The purpose of this plan is to provide information regarding the following topics:

- Submittals required to monitor and control noise
- Construction limitation (noise levels and equipment operations)
- Receptor locations to be monitored and monitoring equipment to be used
- Noise reduction measures needed to meet noise level limitations
- Monitoring and noise reduction equipment and materials needed to achieve noise level limitations
- Construction methods to demonstrate compliance with noise monitoring and control requirements

4.2.2.4 Erosion and Sediment Control Plan

The Erosion and Sediment Control Plan (ESCP) for construction activities presents the measures to be implemented to minimize sediment and other pollutants in stormwater discharges during demolition activities at the BCP. While the BCP demolition does not have potential runoff to a surface water of the state, an ESCP will be prepared to guide implementation of best practices for stormwater management at the site. The ESCP has two major objectives:

- Identify the sources of sediment and other pollutants that affect the quality of stormwater discharges.
- Describe the implementation of practices to reduce sediment and other pollutants in stormwater discharges during construction activities. The ESCP contains BMPs that address source reduction.

The following are proposed elements of the ESCP:

- Site description
- BMPs to be implemented for construction activities
- BMPs to be implemented for erosion and sediment control
- Non-stormwater management
- Waste management and disposal
- Implementation of other approved plans
- Post-construction (demolition) controls
- Site inspections and monitoring
- Responsible personnel
- Personnel training
- Certification of compliance
- ESCP review and modifications

The BMPs will provide measures and controls necessary to mitigate potential pollutant sources. The ESCP will include supporting site maps, plans, details, along with site-specific inspection and monitoring forms. The ESCP performance standards will be included in the bid documents and technical specifications.

4.2.2.5 Environmental Protection Plan

The Environmental Protection Plan (EPP) presents information regarding the environmental management program to be conducted for this project. The purpose of this plan is to present the environmental regulatory requirements for the construction activities. The environmental performance standards will be included in the bid documents and technical specifications. The EPP will help ensure that planning for activities associated with the environmental management program at the Site are conducted in a systematic and well-documented manner. The EPP also details environmental compliance procedures and waste management, as well as regulatory, procedural, and training requirements associated with conducting demolition activities.

4.2.2.6 Waste Management Plan

The purpose of the Waste Management Plan (WMP) is to present the waste management practices and procedures to be followed during the demolition activities, and to establish procedures that maximize the recycling, reuse, and diversion of materials generated during demolition of BCP buildings and structures. The WMP identifies waste management activities conducted during the storage, preparation, and disposal of waste (including waste characterization, packaging, storage, and management while in storage). The transportation and disposal of waste materials at appropriate facilities are also included. The WMP provides information on how waste, including potentially hazardous waste associated with demolition activities, will be managed and disposed of with efficiency. In addition, a secondary goal is to ensure that waste minimization practices are followed, to the extent practical, to reduce the volume of waste that will be generated, stored, and removed from the site. However, the actual methods and techniques employed during demolition of BCP will be the choice of the demolition contractor.

BMPs will be used and materials and equipment will be slated for recycling or reuse when economically practical. Waste reduction and minimization will be a priority.

4.2.2.7 Air Monitoring Plan (AMP)

The AMP will be implemented to ensure that effective air emission control measures are used onsite and to monitor the air quality concentration of pollutants resulting from the proposed demolition project. Morrow County ordinance and OAR 340-208 will be required to address potential emissions of fugitive and asbestos-containing dust during excavation and other soil-handling activities. Demolition plans and specifications will specify engineering controls (moisture conditioning of soil), appropriate PPE, and monitoring equipment (high-volume samples, personal monitoring) to be used, as appropriate.

The demolition activities will involve demolition, excavation, stockpiling, loading, offsite disposal, and recycling of materials consisting of metal, equipment, and waste. An ambient air monitoring station will be established at the site to perform real-time monitoring of wind speed, direction, barometric pressure, and temperature during demolition and earth-moving activities. Air samples will be collected at the monitoring station and will be analyzed for the airborne contaminants of concern. In addition, a minimum of two datalogging particulate monitors (PM₁₀) will be utilized during the site work. The results of the air quality sampling will be used to determine if there are any air quality compliance concerns or if modifications to the demolition activities are needed. The meteorological data for the general project area, particularly wind speed and direction, will be used to decide on the proper locations of the air monitoring stations.

The AMP will be prepared to ensure that activities associated with the air sampling program at the facility are performed using the EPA document 40 CFR, Part 53, for particulate matter of less than 10 microns, total suspended particulates. Data can be monitored in real-time and alarms/mobile notifications can be programmed, allowing for quick response by site personnel. Air data will be included in weekly reports.

The purpose of this plan is to provide information regarding the following systems and procedures:

- Air quality monitoring system
- Meteorological monitoring system
- Operation and maintenance procedures
- Quality assurance and quality control procedures to be instituted by the air quality program
- Procedures for documentation of activities and data reporting

4.2.2.8 Recycling Management Plan (RMP)

The RMP will be prepared by the select demolition contractor as part of the work plan documents. The RMP will contain the following information:

- Recycling materials by type and quantity

- Local vendors who will accept the recycling materials
- Handling and transportation process
- Waste diversion techniques
- Compliance requirements

4.2.2.9 Quality Control Plan (QC)

The QC will be required to establish the basic objectives of the contractor's quality control system. These objectives include the following:

- Ensure that all work adheres strictly to requirements of the contract and governing agencies where the work is being performed.
- Maintain QC procedures to ensure that tasks performed will comply with the contract.
- Prevent deficiencies through preconstruction quality control coordination.
- Detect and correct deficiencies in a timely manner.
- Provide an auditable record of all tests, inspections, procedures, nonconformance, and corrections, and any other pertinent data as required.
- Verify compliance with the contractor's QC procedures, including those QC procedures of subcontractors and suppliers.
- Provide a basis of measuring the contractor's performance for input to Company's Contractor Resource Database.

4.2.2.10 Health and Safety Plan

The Health and Safety Plan will be prepared by the select demolition contractor as part of the work plan documents. The Health and Safety Plan provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the hazard. Contractors and employees must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. The contractor performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response for all onsite parties, the facility, and local emergency-service providers as appropriate. These planning tasks include the following:

- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field trailers: post exit signs above exit doors, and post fire extinguisher signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform the emergency room, ambulance, and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle, place hospital directions and map inside, keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital.
- Brief new workers on the emergency response plan.

5. Demolition-Specific Description of Work

5.1 General Information

Demolition methods will be specific to what the contractor bids and plans on performing. In general, the contractor:

- Will perform jobsite administration including submittals, record keeping, licenses, safety, drug and alcohol testing, medical surveillance program, and all other requirements to maintain a safe and efficient project.
- Will provide transportation and disposal of all recyclable and scrap metals and general construction debris.
- Will evaluate the use of rail transportation for delivery/transportation of materials and equipment offsite, to the maximum extent possible.
- Will be responsible for extraction, dismantling, demolition, rigging, transportation, and disposal of all equipment and materials removed as part of the demolition work. Contractor will have responsibility for any sales tax liability associated with sale of any equipment and material.
- Will be required to coordinate with all onsite contractors during the work, specifically testing, electrical, mechanical/piping, structural, and concrete contractors.
- Will not be permitted to use explosives without prior approval and the appropriate permits.
- Will not be permitted to burn debris and rubbish.
- Will take appropriate measures to avoid accumulating dust in work areas. Contractor will be responsible for keeping haul roads and work areas watered so as not to cause nuisance dusting of plant facilities during the contract.
- Will notify PGE if they encounter any hazardous materials that may impact the safety of employees or that may provide an environmental hazard. Contractor is responsible for the review of PGE-provided ERM survey (once completed). Contractor is not to proceed with work until authorized.
- Will provide HAZWOPER-trained crafts-persons, as required, to execute the work and at least one of the fulltime onsite supervisors and/or the Project Manager (who will have completed the National Demolition Association 40-hour Foundations of Demolition Project Management course).
- Will maintain a daily field log for recording and archiving the daily activities pertinent to the project. At a minimum, the daily activity reports will include items such as the daily attendance of the site-assigned personnel and visitors, site entry logs, use of PPE, quality issues and inspection, visitor logs, daily air monitoring and sampling data, equipment usage logs, environmental survey information, safety and health incident reports, types and quantities of materials excavated and removed from the site, and transactions of asset sales. A comprehensive and customized project documentation profile will be created and maintained for retention and archiving. These logs and reports will always be available for review by PGE.
- Will obtain analytical laboratory results of bulk sampling, ambient air sampling, and OSHA-required monitoring for all abatement work. Laboratory results will be made available to PGE and archived for completion of the Project Closure Report. Daily air monitoring reports will be posted and distributed for review and analysis on a 24-hour turnaround basis as required by the applicable regulatory agencies.
- Will prepare a Project Closure Report that documents all site activities within 30 days of work completion. The report will detail daily site activities, dismantlement, demolition, asset recovery and sales activity, safety and health incidents, and any regulatory or quality compliance violations. The Project Closure Report will also include evidence of methodologies employed for the decommissioning activities, equipment usage, and various sampling protocols and results. The report will be inclusive of, but not limited to, a project operations summary, financial reports, summary of analytical data, air-monitoring reports, bulk sampling reports, shipping documentation, weight slips, quantities of waste materials removed from the site, daily weather conditions, daily supervisors field logs and diary, waste manifests, certificates of disposal, asset transactions or sales, and site sampling data.
- Will protect all areas being demolished via existing fire hydrants, fire water loop system, and hand-held fire extinguishers during demolition. In the event the existing system is inoperable or removed due to demolition activities, temporary hose lines must be placed in service.
- Will provide engineering and studies as necessary to ensure that the structural integrity of structures and buildings is maintained as demolition progresses.
- Will perform final walks of the decommissioned and dismantled area before demobilization of the project to verify that the scope of work has been satisfied and the area has been rendered safe for re-occupancy.
- Will be responsible for protection of buildings and features to remain, including 500 and 230 kV substations, the intake structure, the fire water loop system and other remaining utilities.

5.2 Mobilization

Mobilization for demolition will occur upon completion of the decommissioning and in conjunction with abatement mobilization. Mobilization will include bringing equipment and personnel to the BCP, establishing the BMPs and engineering controls, setting up lay-down areas for equipment and material segregation, establishing Regulated Areas for asbestos abatement and lead controls, and establishing support trailers.

5.3 Establish a Work Area

The contractor's lay-down and mobilization areas will be clearly identified in pre-construction submittals and will not be approved if they impede required site access for critical operations or safety concerns. The contractor, PGE, and the owner's representative will agree on the lay-down areas and required site controls. It is anticipated that the contractor lay-down areas will be in three to four locations depending on the phase of the work and accessibility to the specific scope of work. All vehicles will enter and exit through the site at a controlled location in order to facilitate load management and compliance with the TCP, including vehicle decontamination and dust control. The contractor will be required to provide weekly updates on the planned work and a 3-week look-ahead schedule for site access and traffic planning.

The contractor will clearly demarcate work areas with warnings signs and tape – asbestos and lead-related work will require specific work area demarcation in accordance with OSHA, DEQ, and the ERM bid documents and technical specifications.

The installation of fencing may be required in some locations to restrict site access and secure the contractor's equipment during demolition. Fencing will be required in areas where warnings signs and tape are not adequate to prevent potential falls and other safety hazards in the work areas. The contractor will be fully responsible for securing the work area and monitoring site access to appropriately authorized visitors through engineering and administrative controls. All site visitors will be required to check in at the contractor's site trailer, complete a site safety orientation, and wear site-required PPE (which may vary depending on the areas of work visiting). Visitors will require escort by the contractor. Subcontractors will be required to complete the contractor's Site Safety Orientation and comply with all required Safe Work Plan submittals as identified in the pre-submittal requirements.

5.4 Demolition Methods

For the purposes of this D&D Plan, conventional demolition activities are defined as the demolition of smaller structures that are at or just above the elevation of the cab of excavator, bulldozer, loader, or skid steer loader. These conventional demolition approaches/activities shall only be executed by experienced demolition specialists, as they demolish structures, segregate and load out scrap and debris.

Specialized demolition and/or D&D is defined as demolition approaches which require planning and usually involve multiple resources and additional coordination and could include crane dismantlement activities or felling of structures with or without explosives. Generally, specialized demolition approaches are higher-risk activities, as compared to conventional demolition approaches. The contractor shall utilize an experienced demolition subject-matter expert in the planning and oversight of these approaches.

- A. Any or a combination of the following demolition methodologies may be allowed:
 1. Conventional demolition methods using bulldozers, loaders, demolition equipped excavators, or cranes with wrecking balls to raze/demolish structures.
 2. Potentially feasible specialized demolition methods are as follows. These are NOT "mandatory" or even "preferred methods", but acceptable to PGE if executed safely with the required detailed planning and experienced resources.
 - a. Dismantlement with cranes and certified operators and riggers.
 - b. High-reach and/or ultra-high-reach excavator with the adequate shear and safe boom length to demolish structures.
 - c. Safely pulling over structures with adequate cables and equipment which are located at a safe distance away.
 - d. If large equipment is utilized on the operating floor (or any other elevated floor), shoring or other safety measures shall be taken to provide a safe working platform. Ramping of debris, crushed stone, concrete, or soil to gain excavator or crane reach for any area, will be evaluated for safety and stability on a case-by-case basis.
 3. Other contractor proposed methodologies subject to pre-approval by PGE

- B. Unacceptable approaches include, but are not limited to the following:
1. Tripping of most other structures which requires worker to be inside and or immediately adjacent to the structure while and/or after the steel frame structure is substantially compromised.
 2. Pushing or pulling over structures which are substantially taller than the equipment, which is also in proximity of the structure.
 3. Working under or close to a structure where debris, scrap, concrete, steel, or other demolished materials can contact workers or the equipment operators.
 4. Extensive pre-cutting or pre-weakening of structural members or other items which substantially compromises the integrity of a building, stack, or structure for any reason.
 5. Unsafe activities which could result in unplanned events, near misses, recordable injuries, or fatalities.
 6. On site stripping and sizing of wire; sorting and sizing of material by hand and or cutting torch.
 7. Crane dismantlement of any structure by riggers and operators that are not certified and specialized in this field and well-qualified (as evidenced by an exceptional safety record). This applies to all contractor individuals, vendors, and sub-contractors.

Work will likely include torch-cutting large steel sections and demolishing with an excavator with shear attachment. AECOM expects that cranes will be used to pick sections of buildings and then, once on the ground, the sections will be processed for recycling, disposal, or site reuse. For the higher structures like the crusher, contractors may use specialty felling equipment that can reach the heights or targeted explosive felling.

Concrete will be demolished using an excavator with a breaker attachment. Structures will be demolished to approximately -2 feet BG and the foundation left in place. Non-asbestos materials will be segregated as C&D and recyclable materials. The area around structures will be graded to match existing surrounding grades.

The contractor will be responsible for protecting assets that will remain post-demolition. These include key transformers, intake structure and other features around the site.

5.5 Concrete Processing

Concrete removed as part of the demolition will be staged and sampled per the EPA and DEQ requirements for sampling porous materials. The purpose is to verify and document that the concrete, when processed, is acceptable to be used as backfill. Concrete with LCP will be removed and disposed of offsite.

The concrete will be processed with hydraulic excavator attachments to pieces that are typically no greater than 2' x 2' that are placed into a concrete crusher that includes a magnet used to remove the rebar and other metal reinforcement. The concrete will be processed to a size of 2-inch minus, which is small enough to minimize voids and settlement once placed as backfill.

5.6 Site Restoration, Backfill, and Grading

The demolition areas will be backfilled using the existing soil onsite to the extent possible. Additionally, the concrete from the demolition activities will be used as backfill in basement, pits, and vaults. Consistent with current site stormwater flow, the power block area will be covered with gravel and graded to have stormwater drain as sheet flow towards Carty Reservoir. The coal yard and sewage lagoon areas will be similarly graded and seeded with native plants. Areas that were backfilled will be surveyed and placed on as-built drawings.

During the engineering phase, a final grading plan will be developed to manage stormwater. Once final grading is complete, erosion control measures will be placed to prevent erosion and displacement of the final grading soils. Native grass seed will be distributed across the new soil areas prior to the rainy season so it is naturally watered to inspire growth.

5.7 Demobilization

Demobilization of equipment and resources will begin once substantial completion is met and all punch-list items and site restoration activities are complete. The contractor will remove or stop service of equipment, temporary power or water, and other utilities (e.g. telecommunication services) and leave the site in an acceptable manner. (Note: if construction fencing is installed and there is the potential PGE may want to keep the fencing, this should be discussed during Bid Planning).

5.7.1 Site Security

Once the backfill and grading is complete, the site will be prepped for non-use by securing any gates and fencing that limit access onto the site. PGE will be responsible for securing remaining buildings, structures, or support systems after the contractor's demobilization from the site.

5.7.2 Demobilization

Demobilization of equipment and resources will begin once substantial completion is met and all punch-list items and site restoration activities are complete.

5.7.3 As-Builts

As-built drawings should be completed to document the surveyed location of the remaining foundations, areas that were backfilled, and locations where piping and utilities were terminated.

6. Coal Yard Reclamation and Closure

6.1 Coal Reclamation and Disposal

The BCP operates a relatively large coal yard with a significant volume of residual coal material. Based on current aerial photos, the area of the current coal yard is estimated to be approximately 100 acres. It is currently estimated that 40,000 to 60,000 tons of coal material are currently available for reclamation. The primary strategy for this area is to process, reclaim and burn the currently stored coal material during the remaining life of the facility. A portion of this coal material can be reclaimed relatively easily through traditional excavation methods. However, the lower portions of the coal material within the yard contain a mixture of coal and soil and will require additional separation and processing. Within the industry, there is a contractor (RPM Solutions) that specializes in the reclamation of coal yards through a multi-step separation process.

PGE contracted with RPM Solutions to conduct reclamation of the coal yard. They began the work in April 2020 and are anticipated to work into November 2020. Coal from the reclamation process will be burned within the facility and soil will be returned to the coal yard area.

6.1.1 Backfill, Grading and Revegetation

Following reclamation, the coal yard area will be graded and seeded with native grasses and plants. Any seeded areas damaged during demolition will be repaired by the demolition contractor after the completion of site activities. Revegetation is anticipated to occur in Q4 2020.

7. Ash Disposal Area Closure

PGE conducted two evaluations of the ash disposal area (ADA) closure alternatives. The first evaluation compared excavating the material for beneficial reuse or offsite disposal versus capping that meets CCR requirements. Capping of the ADA was found to be more cost effective, while posing some risk, and remained an effective closure method for the site. The second evaluation examined types of covers and evaluated four types of covers.

The ADA will be closed in accordance with the CCR Rule. However, due to the location of the BCP and the arid nature of the region, it is anticipated that an alternate cover system will be required as the cover system described in the CCR Rule relies on a compacted clay cap and dense vegetative cover system. The cap alternatives analysis considered the various accepted cap systems (system described in CCR Rule, evapotranspiration cover system, synthetic cover system, etc.) and recommended the ClosureTurf® cover system. The ClosureTurf® cover system consists of a geomembrane, overlain by a synthetic grass material that is infilled with sand. The geomembrane satisfies the regulatory requirement for a low-permeability cover material (less than the minimum 1×10^{-5} cm/s assumed for the hydraulic conductivity of the bottom of the ADA) and the synthetic grass and sand infill protects the geomembrane from damage caused by storm water erosion and Ultraviolet (UV) radiation exposure.

8. Cost Estimate

In order to provide the following cost estimates, budget estimates were pulled from actual projects/cost, estimated accounting reserves, a Class 2 cost estimate prepared by AECOM, and engineering judgement. The estimates provided are for budgetary purposes with the intent to capture all costs associated with closing the plant. Salvage credits are highly variable and can be hard to predict.

The overall cost of decommissioning includes employee severance, D&D, asset write-offs of stock room material, end of rail car lease costs, and long-term site operation and maintenance costs. Table 8-1 provides a cost summary for both costs already incurred and future costs. Appendix A contains the detailed cost estimates.

Table 8-1 Cost Summary of Demolition

Task	Cost
Planning & design ¹	\$1,800,000
Decommissioning	\$2,500,000
Coal yard reclamation	\$2,750,000
ADA closure ²	\$8,446,000
Environmental assessment & removal	\$400,000
ERM abatement	\$7,247,000
Demolition	\$25,504,000
Demolition scrap credit ³	(\$5,828,000)
Construction management, services during construction	\$3,275,000
10% Contingency on ERM abatement, demolition and construction management services	\$3,603,000
Employee severance ⁴	\$13,805,000
Rail car lease termination	\$447,000
Inventory end of life removal	\$8,100,000
Inventory scrap credit ³	(\$810,000)
Site security	\$250,000
Nominal cash flow of ongoing site operation and maintenance ⁵	\$3,798,000
TOTAL	\$75,287,000

Notes: All costs are in 2020 dollars or actual costs if task is complete. Costs are ±20%

1. Includes program management, design, assessments, plans, and permitting
2. Assumes closure of disposal area with no ash reclamation
3. Scrap salvage credits are highly variable and volatile and can be hard to predict and may significantly change the estimated cost higher or lower
4. Retention and severance include five years of retention program plus severance costs
5. Long term sites costs include thirty years of groundwater monitoring, ADA operation and maintenance, and site vegetation management. Cost represents 30-year summation of \$90,000/year with annual inflation

9. References

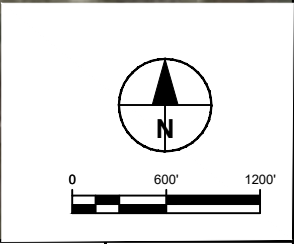
The following documents assisted AECOM in providing the information included in this D&D Plan.


- Decommissioning and Demolition Plan for the Boardman Power Plant in Boardman, Oregon, prepared by CH2M, dated November 2015
- Closure Strategy Plan for the Boardman Power Plant in Boardman, Oregon, prepared by CH2M, dated November 2015
- Closure Plan Ash Disposal Area PGE Boardman Power Plant, prepared by CH2M, dated September 2015
- Boardman Power Plant Environmentally Regulated Material Survey Results, prepared by CH2M, dated April 2018
- Field Investigation Data Results Report, prepared by CH2M, dated March 2018
- Boardman Synchronous Condenser Conversion Study letter, prepared by Burns & McDonnell, dated January 28, 2018
- Synchronous Condenser Project Economics and Regulatory Considerations, prepared by Burns & McDonnell, dated January 25, 2019
- *Natural Gas Conversion Study*, prepared by Mitsubishi Hitachi Power Systems, dated December 3, 2018
- *Review comments by Ezzat B. Khalafalla of AECOM*, Boardman Synchronous Condenser Conversion Study prepared by Burns & McDonnell, dated January 28, 2018
- *Synchronous Condensers for Transmission Systems*, prepared by General Electric, dated November 15, 2013
- *Scenario Evaluation Memo* prepared by AECOM Technical Services, Inc., dated April 11, 2019
- *Draft Carty Isolation Memos* prepared by AECOM Technical Services, Inc., drafts March 2019
- *Revision 1: Closure Alternatives Comparison – BCP ADA Closure* prepared by AECOM Technical Services, Inc. dated May 29, 2020
- *Revision 1: Boardman Plant Decommissioning – ADA CCR Management* prepared by AECOM Technical Services, Inc. dated May 29, 2020

FIGURES

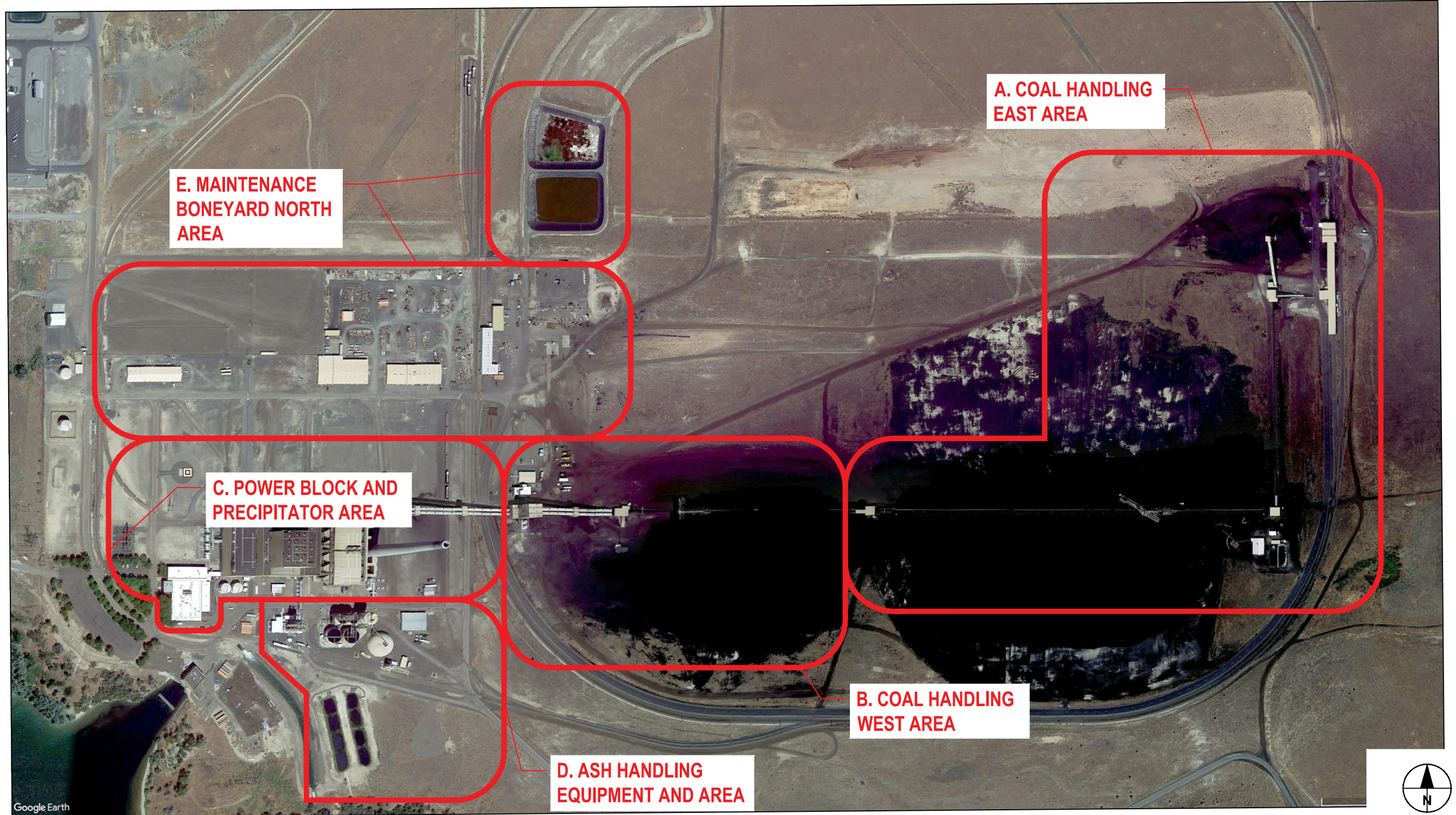


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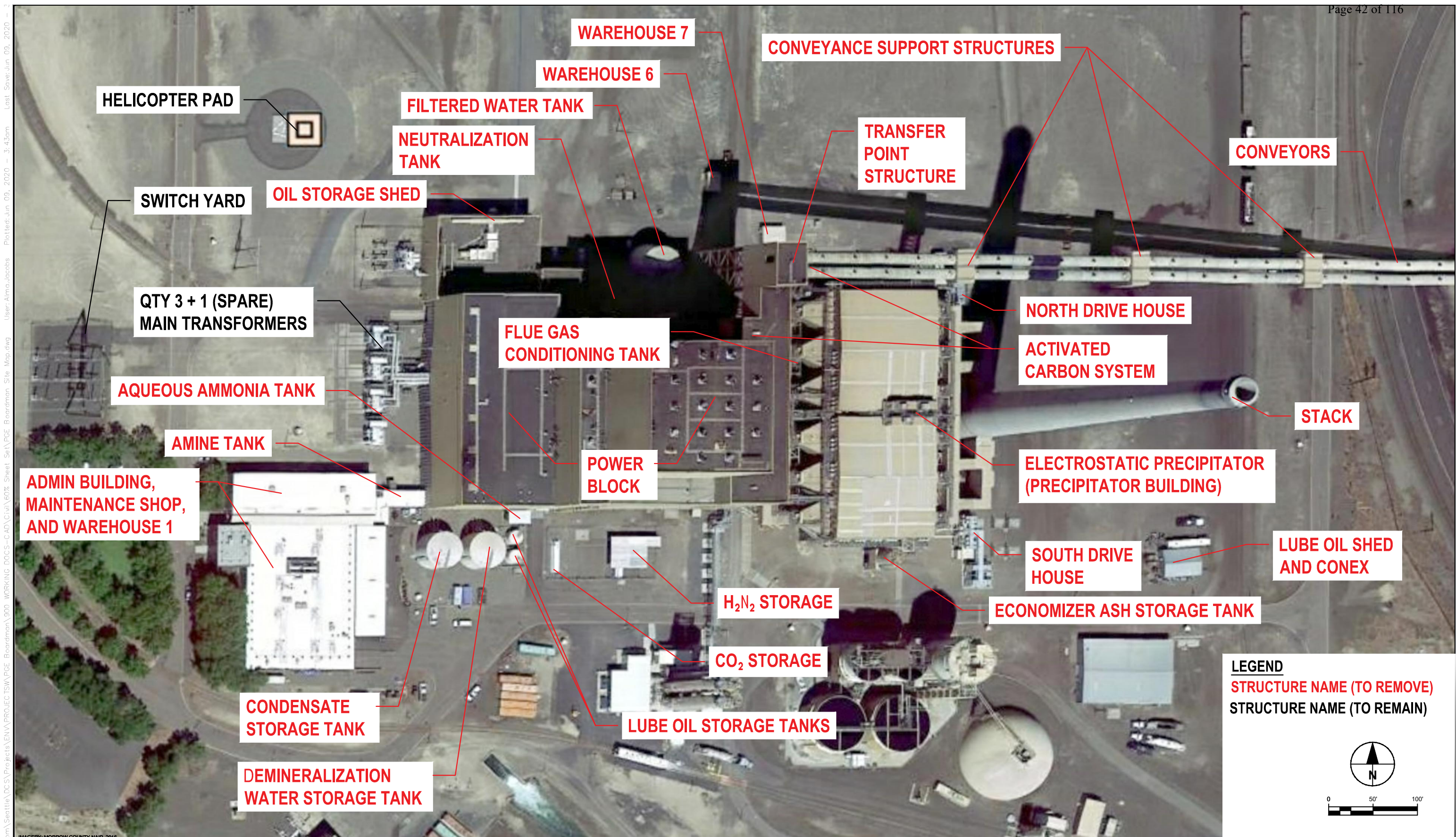
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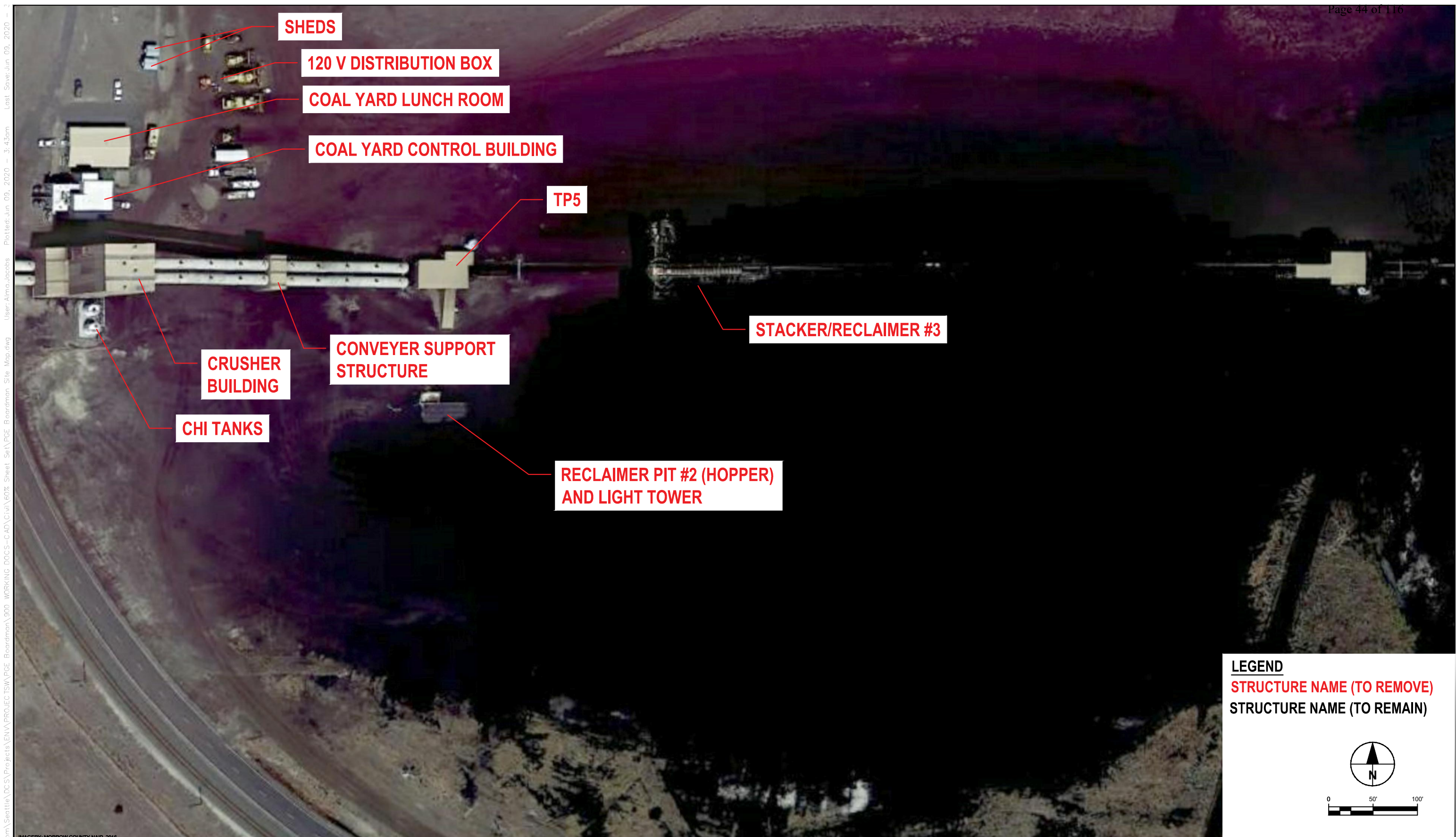
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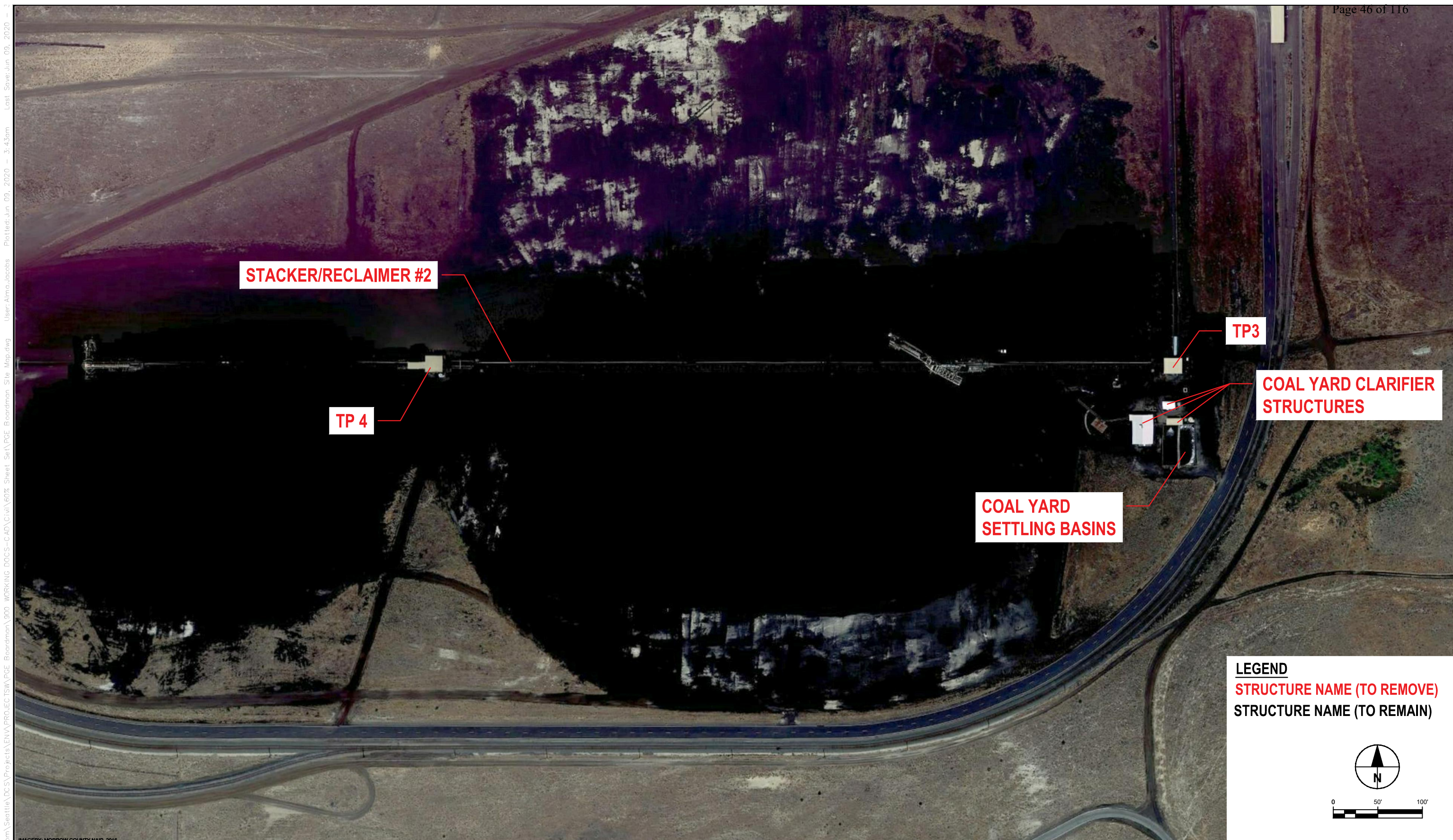
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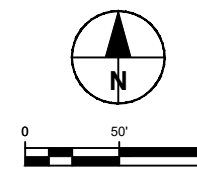
TP 4

TP3

COAL YARD CLARIFIER STRUCTURES

COAL YARD SETTLING BASINS

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APPENDIX A – DETAILED COST ESTIMATES



PGE Boardman Budgetary Costs –Site Demolition Boardman Coal Plant Decommissioning

Prepared by:
AECOM Technical Services
111 SW Columbia St., Suite 1500
Portland, OR 97201

July 30, 2020

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1. Introduction

AECOM Technical Services, Inc. (AECOM) was contracted by Portland General Electric Company (PGE) to prepare a Class 2 level budgetary estimate for the decontamination, demolition, and site restoration of the Boardman Coal Plant (BCP). The work was performed in accordance with the approved scope of work proposal dated January 6, 2020. In addition, PGE requested the inclusion of estimates for various shared services structures and systems between BCP and Carly Generating Plant (CGP).

AECOM understands that the purposes of the estimate include for budgetary planning purposes and possible negotiations with stakeholders such as Idaho Power. This detailed budgetary estimate may also be used for schedule planning.

2. Background

The BCP property is currently fully operational and is operated and maintained by PGE and on-site contractors. The Carly Generating System (CGS) property is adjacent to BCP and will remain fully operational after BCP decommissioning.

PGE is scheduled to stop burning coal at the BCP at the end of 2020 and is requesting an estimate for complete demolition of the BCP site. AECOM Technical Services (AECOM) was selected as the Engineering firm to support the decommissioning and demolition of the BCP. AECOM prepared a Request for Proposal document and conducted a contractor site walk through on June 9-10, 2020. The intent of the site walk was to allow contractors to gather site information regarding in order to submit an updated Budget Proposal to assist AECOM in pricing the demolition and decommissioning. The request for budget proposal was not a bid document. Pricing submitted by each Contractor is kept confidential. AECOM changed the names of the Contractors on the Tables to protect the contractor's information.

3. Scope and Approach of Budgetary Estimate

AECOM completed a site-wide ERM assessment and report and provided the findings including presence, location, and quantities to the Contractor's through summary tables, extent figures, and a copy of the ERM report. In addition, AECOM performed detailed quantity estimates and take-offs for concrete and structural steel and these were provided in the RFP Project Manual and bid forms.

The scope of the budgetary estimate included:

- Pre-demolition activities including:
- Contractor submittals and Planning
- Permitting
- Mobilization/demobilization
- Decontamination, abatement, and remediation
- Asset recovery
- Demolition and civil work

3.1 Assumptions

The detailed list of SOW and design assumptions are included in the RFP Documents included in Appendix B. The following are general assumptions related to the estimates provided:

- The estimates are in 2020 dollars and there is no escalation included
- Scrap metal values are highly variable and the estimates included by the contractors are subject to change especially when more than 60 days old
- The estimate assumes that the demolition and abatement for BCP is awarded as one contract.
- The estimates may include some union labor but not all contractors are union contractors.

3.2 BCP Structures Scheduled for Removal and Restoration

The following lists detailed the structures scheduled for removal, decontamination, demolition, and/or restoration. Please note that there may be minor variations between the listed included here and final design documents.

A. Coal Handling East Area (Dumper Bldg. through TP4)

- UEB Building
- Dumper Building and Control, Rail Car Positioner, Rail Car Wash, and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Thaw Shed and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Transfer Point #1 (TP1)
- Emergency Dump Structure and Reclaim Pit #1
- Transfer Point #2 (TP2)
- Conveyers from TP1 to TP4
- Transfer Point# 3 (TP3)
- Coal Yard Clarifier Buildings and Settling Basin
- Stacker/Reclaimer #2
- Transfer Point #4

B. Coal Handling West Area (Past TP4 through Crusher Building)

- Conveyers from TP4 to Crusher Building, including conveyor support structure
- Stacker/Reclaimer #3
- Transfer Point #5
- CHI Tanks
- Crusher Building
- Coal Yard Control Building
- Coal Yard Lunch Room
- 120V Distribution Box
- Sheds
- Reclaim Pit #2 and Light Tower

C. Power Block and Precipitator Stack (Including Stack and Admin Building)

- Conveyers from Crusher Building to Transfer Structure, including suspended conveyor supports
- Transfer Point Structure
- Precipitator Building and associated equipment
- Economizer Ash Storage Tank
- Stack
- North and South Drive Houses
- Activated Carbon System
- Warehouses 6 and 7
- Filtered Water Tank
- Neutralization Tank
- Flue Gas Conditioning Tank
- H₂N₂ Storage
- Aqueous Ammonia Tank
- Amine Tank
- Lube Oil Storage Tanks
- CO₂ Storage
- Oil Storage Shed
- Power Block (Boiler, Turbine, Control, and Auxiliary Areas)
- Condensate Storage Tank
- Demineralization Water Storage Tank
- Admin Building/Warehouse

D. Ash Handling Equipment and Area

- Lube Oil Shed and Conex
- Warehouse 4
- Contractor Warehouse
- Scale
- Load Out Trailer and Unloading Bins

- Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, and Shed)
- Dry Sorbent Injection (DSI) System
- Waste Oil Storage Tank and Oil/Water Separator
- Maintenance Conexes
- Settling ponds

E. Maintenance Area/Boneyard

- Fuel Island and building
- Sheds
- Bone Yard
- Vehicle Maintenance Building
- Railcar Maintenance Building and rail spur through
- Warehouse 2
- Warehouse 3
- Multi-Purpose Building
- Washwater Pond
- Sewage lagoons

3.3 BCP Structures to Remain

BCP components to maintain include (see attached Figure 2A and 2B in Appendix XX). Remaining structures budgetary estimates are included under Shared Services Tables XX.

- 300,000-gallon potable/fire water tank and associate existing water pipeline
- 230 kV BCP to Dalreed transmission line
- 34.5 kV BCP to railroad crossing at Tower Road transmission line.
- 7.2 kV underground distribution line connecting BCP to the construction substation
- 12.5 kV underground distribution line connecting the construction substation to Boeing Well pump
- 480-volt underground distribution line connecting the 34.5 kV transmission line to the Carty Reservoir seepage pumps
- 500 kV Grassland to Slatt transmission line
- Carty Reservoir
- Water Discharge Channel
- Intake Structure
- Boeing Well and pump
- Construction substation
- Tower road
- Evaporation ponds
- All rail throughout site, except for the two sections (dumper building/thaw shed and railcar maintenance). Protect rail throughout during demolition.
- Main Transformer and the associated rail leading to Transformer
- Helicopter pad and road leading to
- Fuel Oil Storage Tank and supporting pump station

4. Summary of Estimates

AECOM prepared a budgetary scope of work (SOW) and solicited budgetary estimates from five qualified contractors. AECOM evaluated the contractor budgetary estimates and other submitted documents. The compiled estimates are included in Appendix A. Two of the contractor's bids were removed from consideration for being significant outliers based on AECOM's previous estimates and the respondents to the RFP. AECOM averaged the remaining three contractor bids and the average is included as the scope of work (SOW) budgetary estimate in Tables 5-1 and 5-2.

The estimates provided are for budgetary purposes only and assume the work will be performed beginning in 2021 and run through 2023. Actual contractor bids should be solicited in a competitive bid situation and be based on 100% demolition design drawings. Salvage credits are highly variable and can be hard to predict and if used for budgetary purposes should be updated periodically (no more than 90 days).

Table 5-1: Budget Estimate Summary – BCP Demolition

PGE Boardman Demolition Budget RFP Summary		
Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		Estimate
	Work Item	Firm, Fixed Price, \$
Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		
A10	Total Decontamination/ERM Abatement	\$7,247,327
T74	Total Site Demolition and Restoration	\$25,504,201
C67	Credit from Investment Recovery (See IR & Recycling Tab 3)	(\$5,828,280)
	Total	\$26,923,248
ADA Closure		
A1	ADA Closure	\$8,445,948
	Total	\$35,369,196

Table 2-2: Budget Estimate Summary – BCP and Shared Services with CGS

PGE Boardman Demolition Budget RFP (BCP and Shared Services with CGS) Summary		
Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		Estimate
	Work Item	Firm, Fixed Price, \$
Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		
A10	Total Decontamination/ERM Abatement	\$7,247,327
T74	Total Site Demolition and Restoration	\$25,504,201
C67	Credit from Investment Recovery (See IR & Recycling Tab 3)	(\$5,828,280)
	Total	\$26,923,248
ADA Closure		
A1	ADA Closure	\$8,445,948
S1	Shared Services Site Demolition and Restoration	
	Shared Services Site Demolition and Restoration	\$8,887,886
	Total	\$44,257,082

Appendix A : Budgetary Estimate Tables

**Table A1: PGE Boardman Demolition Budget RFP (Complete Demolition of Site)
Schedule of Values**

Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		Contractor A		Contractor B		Contractor C		AVERAGE	
		Quantity	\$/Unit	Firm, Fixed Price, \$	\$/Unit	Firm, Fixed Price, \$	\$/Unit	Firm, Fixed Price, \$	\$/Unit
M9	Mobilization								
1	Pre Mobilization Plans as per Submittal Schedule in Attachment ??	Lump Sum		\$266,500		\$118,792		\$129,826.00	\$171,706
2	Mobilization (Pre Work) Develop and conduct initial employee overall site and scope specific training	Lump Sum		\$169,000		\$241,334		\$44,372.00	\$151,569
3	Higher Risk Plan Development and training cost development and cost on the day of activity	Lump Sum		\$104,000		\$258,621		\$121,538.00	\$161,386
4	Overall and Higher Risk Site Training Cost By Professional 3rd Party	Lump Sum		\$130,000		\$129,310		\$28,730.00	\$96,013
5	Pre Mobilization Activities (e.g. Permits, Licenses, NDA 40hr Certificate, OSHA training, etc.)	Lump Sum		\$110,500		\$86,207		\$7,965.00	\$68,224
6	Mobilization (e.g. Equipment Transportation Cost, Job Trailer set up, etc.)	Lump Sum		\$409,500		\$177,885		\$80,160.00	\$222,515
7	Temp water, electrical, and other site utility services	Lump Sum		\$260,000		\$43,103		\$417,244.00	\$240,116
8	P&P Bond and Insurance (GL, Comp and Auto)	Lump Sum		\$1,156,300		\$790,086		\$330,569.00	\$758,985
9	Project Support (Facilities & Management) (LINE ITEM ADDED BY ENVIROCON)							\$4,364,054.00	\$1,454,684.67
M9	Total Mobilization	Lump Sum		\$2,605,800.00		\$1,845,338.00		\$5,524,458.00	\$3,325,199
A10	Total Decontamination/ERM Abatement								
1	Asbestos - Design, removal, and disposal cost	Lump Sum		\$6,845,390		\$7,805,187		\$5,579,303.00	\$6,743,293
2	Lead - Design, removal, and disposal cost	Lump Sum		0		0		\$69,777.00	\$23,259
5	Universal Waste - (light tubes and ballasts)	Lump Sum		\$300,000		\$56,655		\$178,435.00	\$178,363
6	ESCP Design, Installation (Inc. all BMP) Maintenance and weekly inspections	Lump Sum		\$97,500		\$459,790		\$77,234.00	\$211,508
7	Seismic Modeling by third party firm (if needed as determined by contractor)	Lump Sum		0		\$25,862		\$84,546.00	\$36,803
8	Other (specify here _____)	Lump Sum		0		\$162,302		0	\$54,101
9	Other (specify here _____)	Lump Sum							
A10	Total Decontamination	Lump Sum		\$7,242,890.00		\$8,509,796.00		\$5,989,295.00	\$7,247,327
T74	Total Site Demolition and Restoration								
	A. Coal Handling East Area (Dumper Bldg. to TP4)								
1	UEB Building	Lump Sum		\$21,185		\$5,958		\$517.00	\$9,220
2	Dumper Building and Control and Rail Car Positioner and Rail	Lump Sum		\$184,657		\$54,033		\$16,920.00	\$85,203
3	Thaw Shed	Lump Sum		\$102,293		\$65,057		\$9,496.00	\$58,949
4	Transfer Point #1 (TP1)	Lump Sum		\$71,806		\$72,416		\$6,917.00	\$50,380
5	Emergency Dump Structure and Reclaim Pit #1	Lump Sum		\$115,500		\$56,797		\$9,991.00	\$60,763
6	Transfer Point #2 (TP2)	Lump Sum		\$153,287		\$80,216		\$13,181.00	\$82,228
7	Conveyers from TP1 to TP4	Lump Sum		\$1,402,225		\$188,669		\$15,276.00	\$535,390
8	Transfer Point# 3 (TP3)	Lump Sum		\$92,431		\$97,347		\$11,533.00	\$67,104
9	Coal Yard Clarifier Buildings and Settling Basin	Lump Sum		\$29,013		\$21,629		\$248,608.00	\$99,750
10	Stacker/Reclaimer #2	Lump Sum		\$178,580		\$506,146		\$425,507.00	\$370,078
11	Transfer Point #4	Lump Sum		\$136,991		\$80,144		\$13,137.00	\$76,757
				2,487,968		1,228,412		771,083	\$1,495,821
	B. Coal Handling West Area (Past TP4 to Crusher Building)								
12	Conveyers from TP4 to Crusher Building, including conveyor support	Lump Sum		\$695,867		\$106,546		\$55,234.00	\$285,882
13	Stacker/Reclaimer #3	Lump Sum		\$178,580		\$392,627		\$394,610.00	\$321,939
14	Transfer Point #5	Lump Sum		\$333,778		\$74,686		\$21,437.00	\$143,300
15	CHI Tanks	Lump Sum		\$70,278		\$6,036		\$13,746.00	\$30,020
16	Crusher Building	Lump Sum		\$733,275		\$244,008		\$366,500.00	\$447,928
17	Coal Yard Control Building	Lump Sum		\$21,808		\$20,816		\$43,786.00	\$28,803
18	Coal Yard Lunch Room	Lump Sum		\$22,560		\$16,391		\$10,804.00	\$16,585
19	120V Distribution Box	Lump Sum		\$2,628		\$5,958		\$84.00	\$2,890
20	Sheds	Lump Sum		\$3,760		\$4,216		\$84.00	\$2,687
21	Reclaim Pit #2 and Light Tower	Lump Sum		\$29,089		\$25,279		\$10,995.00	\$21,788
				\$2,091,623		\$896,563		\$917,280	\$1,301,822
	C. Power Block and Precipitator Area (Past Crusher Building to complete Power Block, including Precipitator and Stack)								
22	Conveyers from Crusher Building to Transfer Structure, including conveyor supports	Lump Sum		\$623,137		\$89,066		\$171,114.00	\$294,439
23	Transfer Point Structure	Lump Sum		\$556,738		\$245,131		\$662,794.00	\$488,221
24	Precipitator Building and associated equipment	Lump Sum		\$450,313		\$1,086,741		\$626,504.00	\$721,186
25	Economizer Ash Storage Tank	Lump Sum		\$65,185		\$43,803		\$38,986.00	\$49,325
26	Stack	Lump Sum		\$1,296,563		\$1,648,173		\$373,475.00	\$1,106,070
27	North and South Drive Houses	Lump Sum		\$65,949		\$104,882		\$19,457.00	\$63,429
28	Activated Carbon System	Lump Sum		\$38,266		\$17,798		\$23,004.00	\$26,356
29	Warehouses 6 and 7	Lump Sum		\$8,895		\$9,973		\$6,981.00	\$8,616
30	Filtered Water Tank	Lump Sum		\$81,278		\$23,677		\$5,226.00	\$36,727
31	Neutralization Tank	Lump Sum		\$55,611		\$35,210		\$12,047.00	\$34,289
32	Flue Gas Conditioning Tank	Lump Sum		\$34,222		\$9,120		\$5,190.00	\$16,177

**Table A1: PGE Boardman Demolition Budget RFP (Complete Demolition of Site)
Schedule of Values**

Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices		Contractor A			Contractor B		Contractor C		AVERAGE	
Work Item	Quantity	\$/Unit	Firm, Fixed Price, \$	\$/Unit	Firm, Fixed Price, \$	\$/Unit	Firm, Fixed Price, \$	\$/Unit	Firm, Fixed Price, \$	
33	H2N2 Storage	Lump Sum	\$72,722		\$8,508		\$7,110.00		\$29,447	
34	Aqueous Ammonia Tank	Lump Sum	\$20,319		\$7,497		\$2,073.00		\$9,963	
35	Amine Tank	Lump Sum	\$38,500		\$6,704		\$392.00		\$15,199	
36	Lube Oil Storage Tanks	Lump Sum	\$21,389		\$13,569		\$7,790.00		\$14,249	
37	CO2 Storage	Lump Sum	\$10,160		\$6,386		\$1,905.00		\$6,150	
38	Oil Storage Shed	Lump Sum	\$5,194		\$10,611		\$1,569.00		\$5,791	
39	Power Block (Boiler, Turbine, Control, and Auxiliary Areas)	Lump Sum	\$10,122,113		\$6,075,147		\$2,809,249.00		\$6,335,503	
40	Condensate Storage Tank	Lump Sum	\$79,139		\$21,479		\$11,725.00		\$37,448	
41	Demineralization Water Storage Tank	Lump Sum	\$79,139		\$20,200		\$11,725.00		\$37,021	
42	Admin Building/Warehouse	Lump Sum	\$288,888		\$117,555		\$437,331.00		\$281,258	
			\$14,013,720		\$9,601,230		\$5,235,647		\$9,616,866	
	D. Ash Handling Equipment and Area									
43	Lube Oil Shed and Conex	Lump Sum	\$12,453		\$5,161		\$42,816.00		\$20,143	
44	Warehouse 4	Lump Sum	\$65,823		\$34,932		\$108,864.00		\$69,873	
45	Contractor Warehouse	Lump Sum	\$7,520		\$10,398		\$19,965.00		\$12,628	
46	Scale	Lump Sum	\$40,639		\$9,957		\$542.00		\$17,046	
47	Load Out Trailer and Unloading Bins	Lump Sum	\$62,055		\$13,347		\$15,472.00		\$30,291	
48	Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, Settling Tank, and Shed)	Lump Sum	\$567,875		\$384,115		\$662,452.00		\$538,147	
49	Dry Sorbent Injection (DSI) System	Lump Sum	\$227,384		\$356,030		\$178,772.00		\$254,062	
50	Waste Oil Storage Tank and Oil/Water Separator	Lump Sum	\$45,069		\$47,625		\$6,818.00		\$33,171	
51	Maintenance Conexes	Lump Sum	0		\$7,117		\$212,807.00		\$73,308	
			\$1,028,818		\$868,682		\$1,248,508		\$1,048,669	
	E. Maintenance Boneyard Area North									
52	Fuel Island and building	Lump Sum	\$20,391		\$11,268		\$26,857.00		\$19,505	
53	Sheds	Lump Sum	\$2,256		\$3,694		\$841.00		\$2,264	
54	Bone Yard	Lump Sum	\$123,580		\$191,934		\$90,370.00		\$135,295	
55	Vehicle Maintenance Building	Lump Sum	\$154,475		\$33,633		\$16,020.00		\$68,043	
56	Railcar Maintenance Building and rail	Lump Sum	\$79,613		\$72,500		\$56,620.00		\$69,578	
57	Warehouse 2	Lump Sum	\$160,111		\$64,492		\$76,289.00		\$100,297	
58	Warehouse 3	Lump Sum	\$195,691		\$122,682		\$94,681.00		\$137,685	
59	Multi-Purpose Building	Lump Sum	\$101,521		\$70,047		\$49,624.00		\$73,731	
			\$837,638		\$570,250		\$411,302		\$606,397	
	F. Civil and Site Restoration									
61	Sewage Lagoons (estimate 14,456 Ton for disposal of soils/sludge)	Lump Sum	\$795,080		\$889,496		\$1,120,882.00		\$935,153	
62	Settling Ponds in Area D (estimate 12,000 ton for removal/disposal of soil/sludge)	Lump Sum	\$660,000		\$738,375		\$934,202.00		\$777,526	
63	Equipment Wash water Pond - Area E (estimate 641 Ton for disposal of soils/sludge)	Lump Sum	\$35,255		\$39,442		\$48,878.00		\$41,192	
64	Concrete Processing, Crushing and Placing over Areas C, D, and E at 3" think	Lump Sum	\$1,200,000		\$1,518,299		\$2,459,403.00		\$1,725,901	
65	3" of Top Soil and Hydro Seed over demolished and distributed areas A and B	Lump Sum	\$187,963		\$2,662,603		\$174,563.00		\$1,008,376	
66	Underground Utility Work locates before and after (Include GPR locate, GPS/Survey for 'As Built')	Lump Sum	\$32,500		\$86,207		\$148,857.00		\$89,188	
67	Underground Utility Capping based on 30 locations ranging from 4" to 11" Diameter	Lump Sum	\$58,500		\$31,034		\$14,444.00		\$34,659	
68	Underground Utility Capping based on 20 locations ranging from 12" to 36" Diameter	Lump Sum	\$65,000		\$20,690		\$10,333.00		\$32,008	
69	Bulkheading All Conveyor Tunnels at -2' Below Grade (BG)	Lump Sum	\$260,000		\$68,966		\$203,515.00		\$177,494	
70	Filling Manholes, Catch basins, Electrical vaults etc. with concrete and demo -2'BG	Lump Sum	\$149,500		\$144,828		\$21,875.00		\$105,401	
71	Intake and Discharge Tunnels flow fill 500psi and bulkhead intake	Lump Sum	\$845,000		\$495,041		\$369,162.00		\$569,734	
72	Backfill and Grading (See Site Restoration Quantities Worksheet Tab 4)	Lump Sum	\$3,560,852		\$1,468,089		\$2,211,874.00		\$2,413,605	
73	Demobilization	Lump Sum	\$227,500		\$306,698		\$63,377.00		\$199,192	
			\$8,077,150		\$8,469,768		\$7,781,365		\$8,109,428	
T74	Total Site Demolition and Restoration	Lump Sum	\$38,385,607.00		\$31,990,039.00		\$27,878,938.00		\$32,751,528.00	
C67	Credit from Investment Recovery (See IR & Recycling Tab 3)	Lump Sum	\$6,047,900.00		\$4,450,477.00		\$6,986,464.18		\$5,828,280.39	
N68	Net Proposal (Total Mob, Decontamination, Deactivation and Demolition - Credit from Investment Recovery)	Lump Sum	\$32,337,707.00		\$27,539,562.00		\$20,892,473.82		\$26,923,247.61	

**Table A2: PGE Boardman Demolition Budget RFP
 (Demolition of Shared Services with CGS)**

		Estimate
	Work Item	Firm, Fixed Price, \$
S1	Demolition of Shared Services	
1	Intake Structure and Carty Reservoir	\$5,310,950
2	Discharge Structure and Channel	\$180,100
3	Sanitary Sewer Lagoons	\$2,544,000
4	New Office and Warehouse Building Demo CGS (60' x 100')	\$36,000
5	Boeing Well and pump associate existing water pipeline to Boeing Well	\$8,500
6	300,000-gallon carbon steel potable /fire water tank	\$15,500
7	12.5kV transmission from construction sub to Boeing Well	\$20,000
8	7.2 kV transmission from BCP to CGS	\$20,000
9	230 kV from BCP to Dalreed 16 miles	
10	Remove and reel up 3 phase transmission line 16 miles x 3 wires = 48 miles (253,440ft) of wire	\$72,000
11	Towers @ 80' apart = 1,048 supports x 2,096 tons . Disposal \$16 a ton special waste Finley Buttes Marrow County landfill	\$33,536
12	18 wheel tractor and flat-bed trailer, 80,000 pound capacity that costs \$125/hour	\$150,000
13	Backfill qty 2 pole holes with self compacting gravel and 12" topsoil at each of the 1,048 locations	\$52,400
12	Sanitary Drainage System	\$444,900
S1	Shared Services Site Demolition and Restoration	\$8,887,886

Appendix B : Structures Listings and Site Figures

B1 BCP Structures Scheduled for Removal and Restoration

The following lists detailed the structures scheduled for removal, decontamination, demolition, and/or restoration. Please note that there may be minor variations between the list included here and final design documents.

A. Coal Handling East Area (Dumper Bldg. through TP4)

- UEB Building
- Dumper Building and Control, Rail Car Positioner, Rail Car Wash, and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Thaw Shed and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Transfer Point #1 (TP1)
- Emergency Dump Structure and Reclaim Pit #1
- Transfer Point #2 (TP2)
- Conveyers from TP1 to TP4
- Transfer Point# 3 (TP3)
- Coal Yard Clarifier Buildings and Settling Basin
- Stacker/Reclaimer #2
- Transfer Point #4

B. Coal Handling West Area (Past TP4 through Crusher Building)

- Conveyers from TP4 to Crusher Building, including conveyor support structure
- Stacker/Reclaimer #3
- Transfer Point #5
- CHI Tanks
- Crusher Building
- Coal Yard Control Building
- Coal Yard Lunch Room
- 120V Distribution Box
- Sheds
- Reclaim Pit #2 and Light Tower

C. Power Block and Precipitator Stack (Including Stack and Admin Building)

- Conveyers from Crusher Building to Transfer Structure, including suspended conveyor supports
- Transfer Point Structure
- Precipitator Building and associated equipment
- Economizer Ash Storage Tank
- Stack
- North and South Drive Houses
- Activated Carbon System
- Warehouses 6 and 7
- Filtered Water Tank
- Neutralization Tank
- Flue Gas Conditioning Tank
- H2N2 Storage
- Aqueous Ammonia Tank
- Amine Tank
- Lube Oil Storage Tanks
- CO2 Storage
- Oil Storage Shed
- Power Block (Boiler, Turbine, Control, and Auxiliary Areas)
- Condensate Storage Tank
- Demineralization Water Storage Tank
- Admin Building/Warehouse

D. Ash Handling Equipment and Area

- Lube Oil Shed and Conex
- Warehouse 4
- Contractor Warehouse
- Scale
- Load Out Trailer and Unloading Bins

- Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, and Shed)
- Dry Sorbent Injection (DSI) System
- Waste Oil Storage Tank and Oil/Water Separator
- Maintenance Conexes
- Settling ponds

E. Maintenance Area/Boneyard

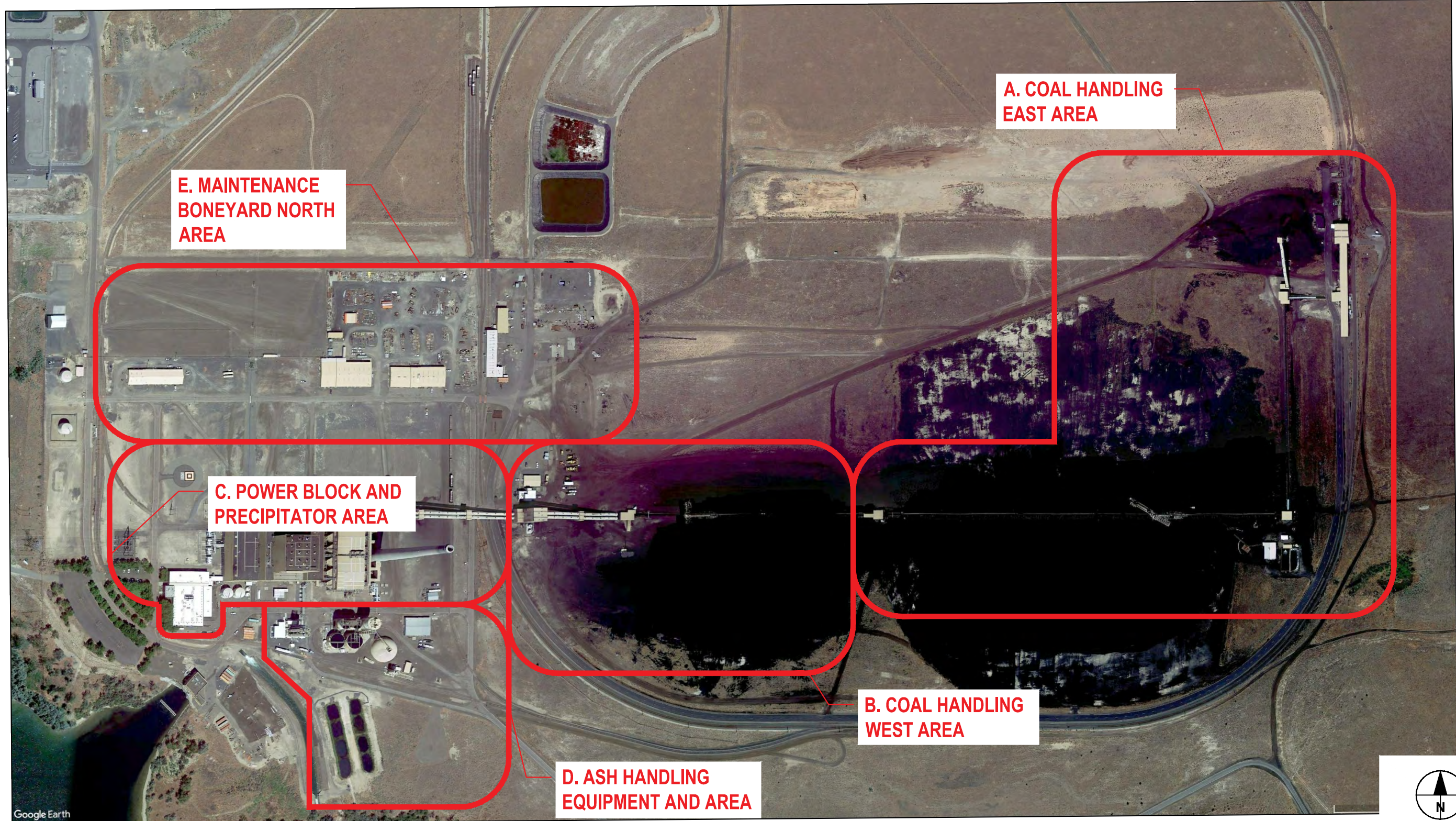
- Fuel Island and building
- Sheds
- Bone Yard
- Vehicle Maintenance Building
- Railcar Maintenance Building and rail spur through
- Warehouse 2
- Warehouse 3
- Multi-Purpose Building
- Washwater Pond
- Sewage lagoons

B2 BCP Structures to Remain

BCP components to maintain include (see attached Figure 2A and 2B). Remaining structures budgetary estimates are included under Shared Services Tables 5-2 and A-2.

- 300,000-gallon potable/fire water tank and associate existing water pipeline
- 230 kV BCP to Dalreed transmission line
- 34.5 kV BCP to railroad crossing at Tower Road transmission line.
- 7.2 kV underground distribution line connecting BCP to the construction substation
- 12.5 kV underground distribution line connecting the construction substation to Boeing Well pump
- 480-volt underground distribution line connecting the 34.5 kV transmission line to the Carty Reservoir seepage pumps
- 500 kV Grassland to Slatt transmission line
- Carty Reservoir
- Water Discharge Channel
- Intake Structure
- Boeing Well and pump
- Construction substation
- Tower road
- Evaporation ponds
- All rail throughout site, except for the two sections (dumper building/thaw shed and railcar maintenance). Protect rail throughout during demolition.
- Main Transformer and the associated rail leading to Transformer
- Helicopter pad and road leading to
- Fuel Oil Storage Tank and supporting pump station


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IMAGERY MORROW COUNTY NAIP, 2016

No.	DATE	BY	REVISION

JOB No. ---	DESIGNED: ---	PROJ. ENGINEER: ---
SCALE: --	DRAWN BY: ---	APPROVED BY: ---
	CHECKED BY: ---	DATE: June 9, 2020

WARNING

 IF BAR DOES NOT MEASURE 1" AT FULL SIZE, THEN SCALES ON DRAWING NOT TO SCALE

AECOM
 111 SW Columbia, Suite 1500
 Portland, Oregon 97201-5814
 (tel) 503-222-7200
 (fax) 503-222-4292
 www.aecom.com

BOARDMAN COAL PLANT DECOMMISSIONING
OVERALL SITE MAP

DRAWING NUMBER: C-200	
CAD FILE NUMBER: ---	
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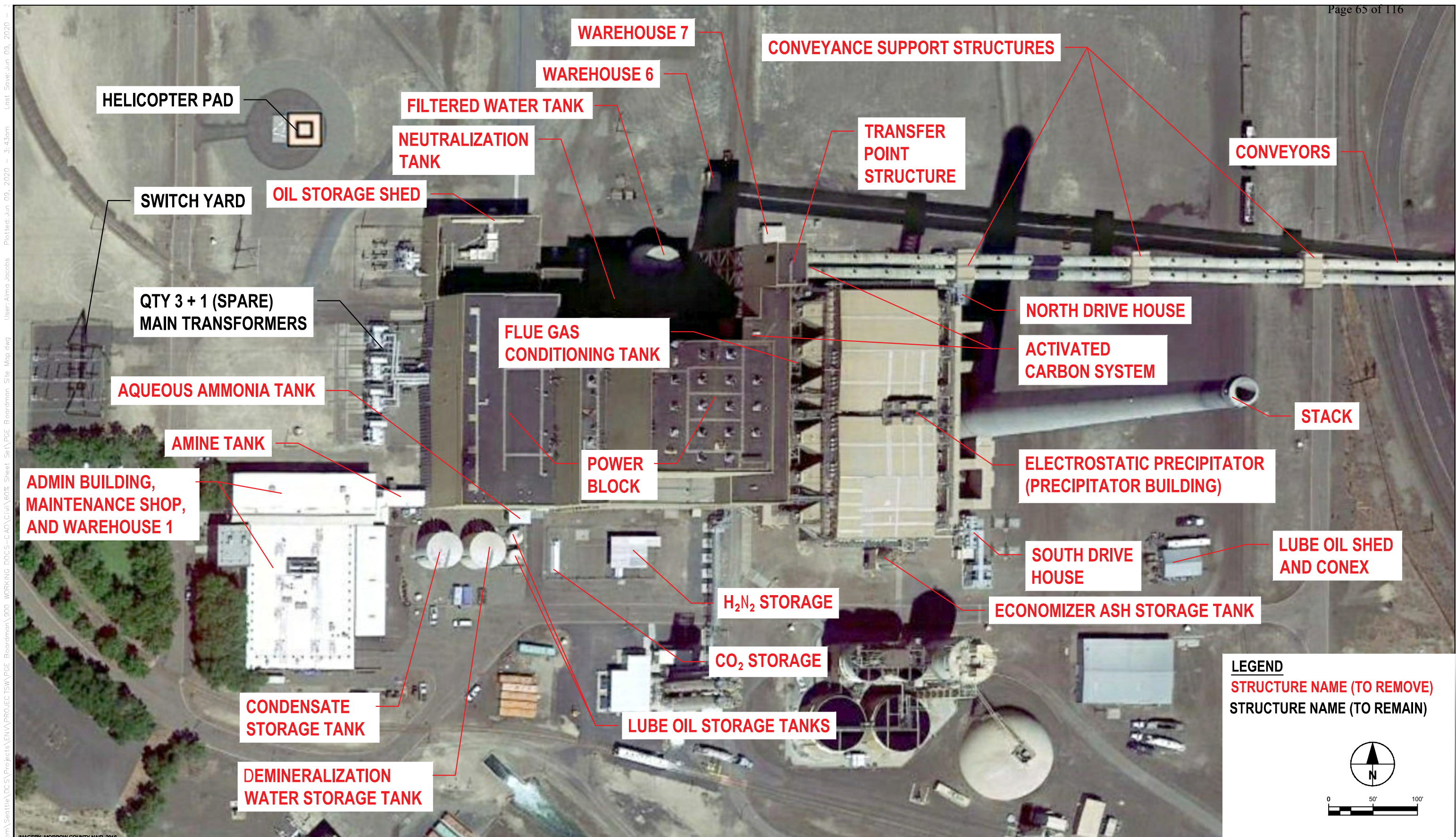
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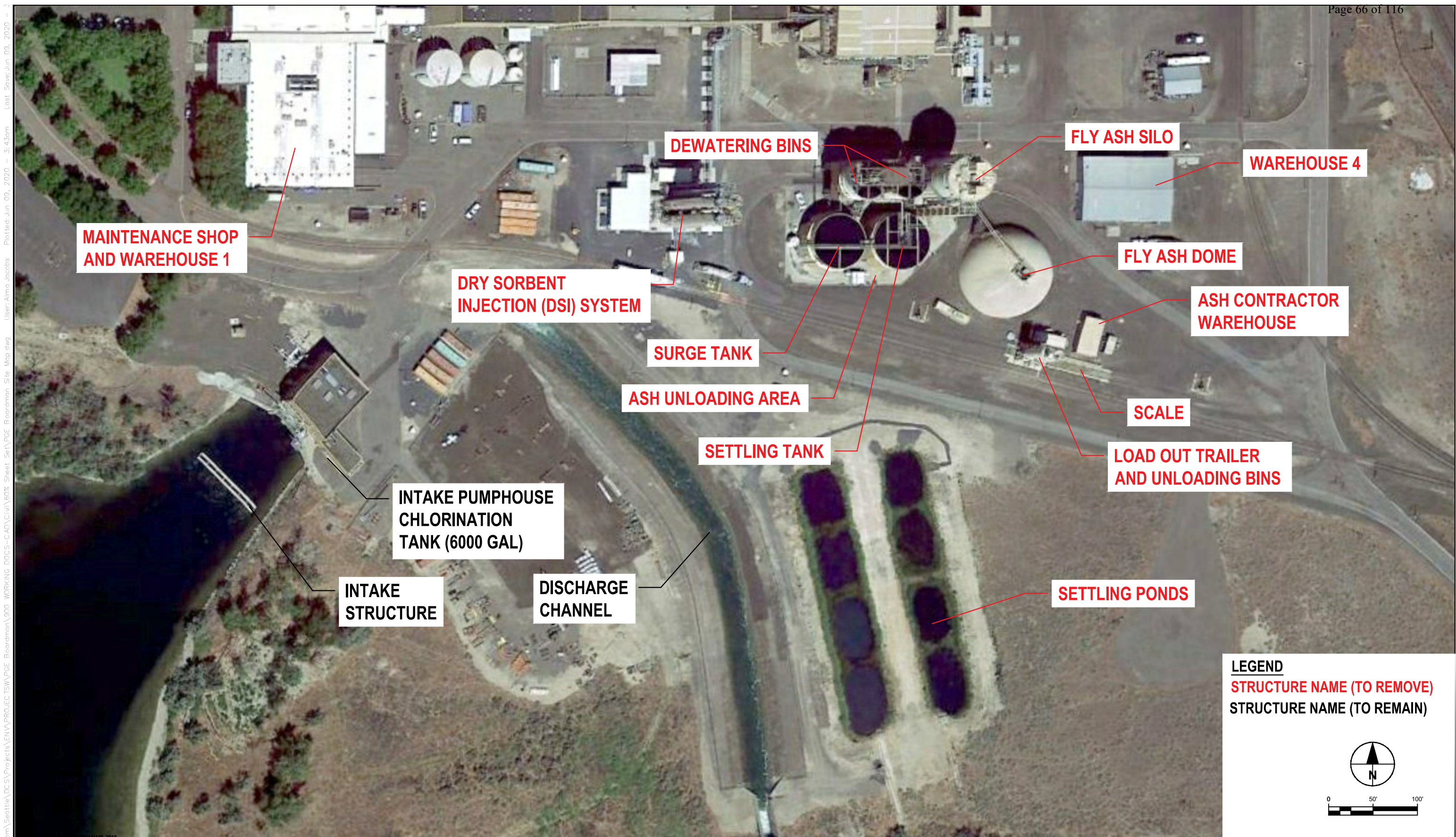
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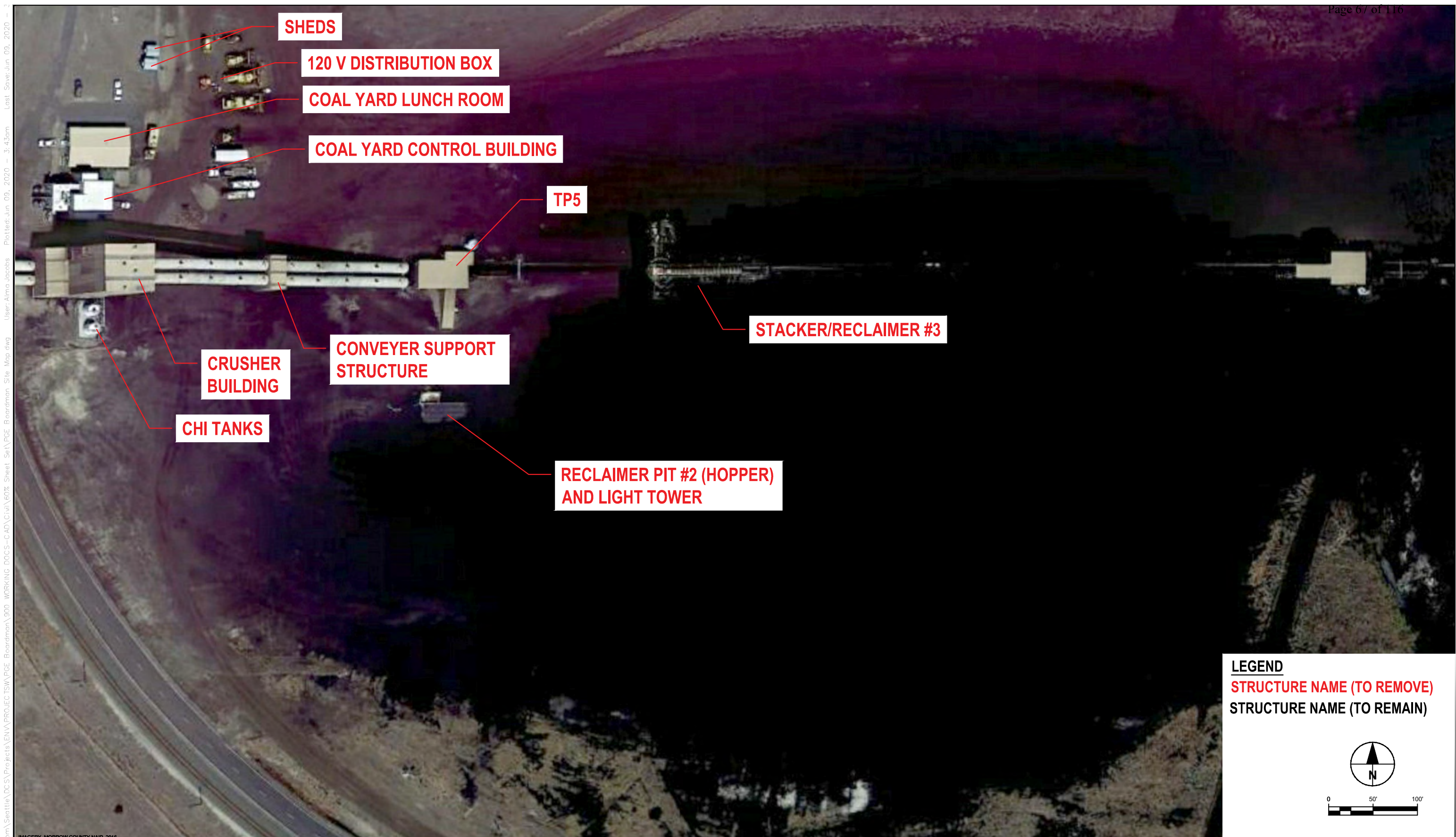
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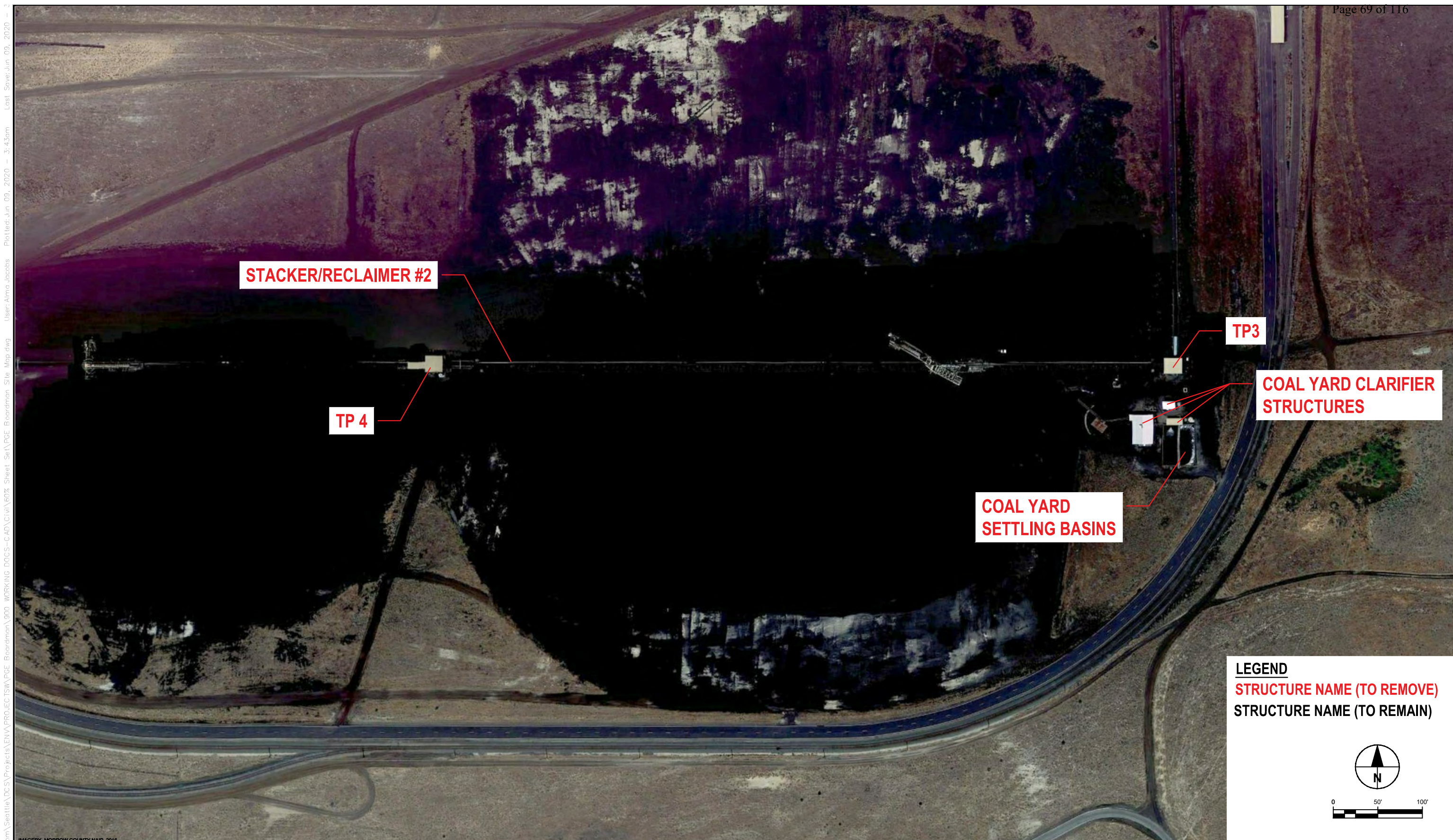
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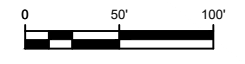
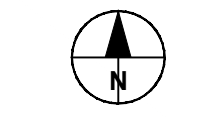
TP 4

TP3

COAL YARD CLARIFIER STRUCTURES

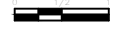
COAL YARD SETTLING BASINS

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BOARDMAN COAL PLANT DECOMMISSIONING
COAL HANDLING EAST AREA 2

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Appendix C : Excerpts from AECOM Prepared Budgetary RFP Document

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1. Introduction

1.1 Project Overview

PGE is requesting budget costs to include complete demolition of the entire Boardman Coal Plant (BCP) site. In 2019, contractors were requested to visit the BCP site and provide a cost estimate for selected demolition of the coal yard and associated coal handling systems. The abatement and demolition for this updated scope of work (SOW) and request for updated cost estimate includes the remaining structures to complete the demolition of the entire site, in addition to the scope in the original RFP Budget Request, except as noted in Section 2.

Structures will be removed to 2' below grade. All underground structures and utilities will be removed and capped to 2' below grade and restored to match the surrounding grades. The concrete is to be crushed and used as 3" cover over the demolished power block and adjacent demolished areas to match the surrounding grades. A site walk for Respondents is scheduled for 10am on June 10, 2020 at BCP.

1.2 Disclaimer

PGE is scheduled to stop burning coal at the BCP at the end of 2020 and is requesting an estimate for complete demolition of the BCP site. AECOM Technical Services (AECOM) was selected as the Engineering firm to support the decommissioning and demolition of the BCP and is requesting that selected Contractors perform a site walk at BCP, on June 10, 2020, with AECOM, in order to submit an updated Budget Proposal to assist AECOM in pricing the demolition and decommissioning as outlined in this Budget request. This request for budget proposal is not a bid document. The requested budget proposal submittal is to assist AECOM and will not result in an award of work or other compensation. Pricing submitted by each Contractor will be kept confidential. AECOM will not share pricing and or contractor approach information provided from each Contractor with any other entity, including other Contractor's submitting budget proposals in response to this request, except as necessary with PGE.

PGE has no obligation to include the Contractors that are submitting this budget proposal requested by AECOM in any future requests for qualifications or requests for proposals for any future work with PGE. Each Contractor submitting a budget proposal provides this information at their own expense. PGE and/or AECOM will not reimburse any costs associated with the site visit or incurred in providing the budget proposal submittal requested herein. This budget proposal site walk-through and submittal is being conducted between AECOM and the Contractors at the PGE owned Boardman Coal Plant and is not sponsored by PGE.

1.3 Definitions

Capitalized terms and Abbreviations used in this budget RFP are defined below.

"Addendum" shall mean a written document or drawing issued to Contractors before the RFP Budget due date to reflect changes, clarifications, or corrections to the contract documents.

"Bid Proposal Documents" shall mean all documents forming the basis of the request for bid proposal. These include but are not limited to: drawings, specifications, sketches, attachments, codes and referenced items relating to the project.

"BCP" shall mean the PGE Boardman Coal Plant.

"Budget Documents" shall mean any drawings, documents, or specifications that are included in this RFP Budget.

"CGS" shall mean the PGE Carty Generating Station

"Company or Owner" shall mean PGE Electric Company and any successor entity thereto, subject to the applicable rules of OR-OSHA, ODEQ, and the Federal Energy Regulatory Commission (FERC).

"D&D" shall mean Decontamination and Demolition. The decontamination for example includes hazardous and other materials that require manifesting such as asbestos abatement and the contaminated oily waste pond. Demolition is

defined on this project as the process to take down and remove structures and utilities to 2' below grade (BG). This RFP budget is for the D&D and site restoration.

"DEQ" and "ODEQ" shall mean Oregon Department of Environmental Quality

"D4" Decommissioning encompasses plant deactivation, decontamination and demolition activities (D4).

"IAW" shall mean In Accordance With as noted in RFP, Specifications, Drawings, Regulations etc.

"OSHA" shall mean Occupational Safety and Health Administration.

"Pre-D&D" includes the regulated but non-hazardous decommissioning activities such as universal waste and the draining of oils from larger gear boxes and deactivation to make the facility cold, dark and dry which will be performed by PGE, unless otherwise specified in this document as performed by the contractor.

"Plant" shall mean Boardman Coal Plant located at 73334 Tower Road, Boardman, Oregon 97818.

"Proposal" shall mean a Respondent's submittal in response to this RFP BUDGET.

"RFP Budget" shall mean this Request for Proposal describing the Company's needs and seeking responses to fulfil those needs.

"Respondent or Contractor" shall mean the entity that responds to this RFP Budget by submitting a Proposal in accordance with the requirements herein.

"Scope of Work" shall mean the demolition of the entire BCP site, excluding only those structures and facilities specifically mentioned. .

"Salvage" shall mean and any equipment or material that can be sold for revenue as listed on the bid form.

"Scrap" shall mean the BCP assets such as copper, steel, aluminium, etc. that will be recycled.

"SME" shall mean subject matter expert which requires decades of experience on the subject and in this case the demolition approaches utilized to take down BCP facilities.

2. Request for Budget Proposal

2.1 Scope of Work

PGE is looking for proven safe approach to the demolition and best solution and value for the scrap, and demolition of the entire BCP site, including asbestos abatement, as identified. For purposes of this RFP, all Labor quoted shall not be represented by a bargaining unit.

BCP Entire Site Demolition Respondents shall provide Proposals on the following Scope of Work as further detailed in this RFP Budget document. See Appendices H and I for forms for Proposal submittal forms. This budget and project should be priced with the utilization of your best resources (i.e. people and equipment) and best practices that include but not limited to the development and utilization of detailed work plans for higher risk activities with QA/QC hold and witness points that are designed by your companies leading SME that is working with your project leaders and crews utilizing lessons learned, risk register's, JHA and other industry best management practices.

- Provide current pricing, AECOM will adjust for inflation if necessary
- Contractors are encouraged to provide their own structural engineer, but it is not required
- PGE will provide security at the gate, and retain control of the site

2.2 Pre-Demolition Activities Outline

2.2.1 Contractor Submittals and Planning

- Demolition Plan
 - Contractor shall budget for submission of a demolition plan in accordance with the guidelines outlined in Appendix G. The following are key elements of the plan:
 - Overall project work plan and site and scope specific ES&H plan
 - Development of a project risk register that will be reviewed and updated on a monthly basis.
 - Detailed work plans for higher risk activities.
 - Utilization of a minimum two written lessons learned (LL) for each higher risk work plan. The LL must be the result of something that did not go as planned during the utilization of the same higher risk approach on a former project.
 - Utilization of QAQC hold and witness points in the work plans that allow for PGE and its third party assigned resources to ‘trust and verify’ before the subsequent step is performed.
 - Utilization of other best practices that your organization has utilized that has resulted in measurable safety and or other improvements. For example, these AECOM plan and other D4 requirements have resulted in more than a decade of zero TRIR D&D projects and programs. Most of which were completed ahead of schedule and under budget.
 - Development of a one-hour project orientation and 15-30 minute detailed work plans review just before a higher risk activity. This shall be developed with a training profession
 - Expectations will be discussed in further detail at the June 10, 2020 site walk.
- Erosion Sediment Control Plan (ESCP) that meets the requirements of Oregon’s Construction Stormwater General Permit (1200C)
- Schedule
 - Contractor shall include a high-level major milestone schedule, in the format of the example included in the Appendix D RFP Bid Form, as part of the RFP Budget submitted

2.2.2 Decontamination, Abatement, and Remediation

- Abatement:
 - Perform all asbestos abatement (See Appendix C for ACM extent figures and Appendix D RFP Budget Bid Form for quantities)
 - Note: all asphaltic roofs are assumed to be asbestos-containing whether or not they are shown on the drawings
 - Perform lead stabilization and control during demolition
 - Universal Waste and other hazardous waste removal (contractor will assume removal and disposal of all light tubes and ballasts as listed in Appendix D of the RFP Bid Form. For reference, all universal wastes are listed in the RFP Bid Form, however PGE will remove all but the lights and ballasts, which shall be the responsibility of the demo contractor)
- Waste Characterization, Handling, Transportation, and Disposal
 - Clean construction and demolition debris
 - Universal wastes (for examples, see above)
 - RCRA Hazardous Waste
 - Toxic Substance Control Act-regulated materials

- Recycled Material Quantities, Disposition, and Transport
 - Recycled Metals
 - High-value Alloys
- Used Oils and Grease
 - PGE will be removing and recycling used oils prior to demolition
 - Contractor may need to clean de minimus oil residue in pipes, tanks, gear boxes, etc.
 - Grease will be present in the conveyor rollers and other areas; contractor may encounter grease in quantities of approximately one cup in various locations throughout
- Equipment Decontamination and Closure. PGE will wash down the coal handling equipment and areas, but contractor should expect to find some areas of accumulated ash that were inaccessible to PGE during cleaning prior to demolition.
 - Coal Handling East Area
 - Coal Handling West Area
 - Ash Handling Equipment and Area
 - Maintenance Boneyard North Area
 - Power Block and Precipitator Area (including Boiler)

2.3 Demolition Activities

2.3.1 Asset Recovery

- Asset Recovery Evaluation
- Boneyard and other scrap
 - Assume equipment and scrap will be left on site for contractor disposal and recycling
 - Contractor will take possession and can salvage or scrap remaining items on site
 - Document items/quantities that are salvaged or scrapped and submit to PGE

2.3.2 Demolition Specific Scope of Work

- Mobilization
- Temporary Facilities
 - Contractor will bring in water trucks for temporary water, and pump water from the Carty Reservoir for construction use
 - Contractor to provide all temporary power
 - Lighting will be provided by contractor
- Turbine Generator Bay Crane
 - Contractor may use the crane in the Turbine Generator Bay Area, however contractor will be required to provide own rigging and inspections. All liability and responsibility for the crane will be the contractor's responsibility.
- Establish a Work Area
- Demolish all structures listed in Section 2.2 to 2' below grade. All underground structures and utilities will be removed and capped to 2' below grade

- Bulkhead either end of the conveyor tunnels and any other underground tunnels on site to 2' below grade at the opening to the underground portions of the tunnels, after removing conveyor equipment (where possible) from tunnels
- Demolish concrete structures to 2' below existing grade, torch-off rebar, crack the bottom slab, then back fill and compact IAW civil scope requirements in Section 2.3.3 below.
- The following deliberate collapse demolition methods will be discouraged and or prohibited:
 - Deliberate collapse by “tripping” the structure which requires extensive pre-cutting of a structure to the point that it’s substantially compromised while workers are inside and or adjacent to the structure during final preparations
 - Deliberate collapse by “bird mouting” a stack, silo, and or cylindrical structure to the point that it’s substantially compromised while workers are inside and or adjacent to the structure during final preparations
 - Other approaches which requires the extensive removal of structural members that substantially compromises it while workers are inside and or adjacent to the structure during final preparations
- Proposals shall include the contractor’s approach to demolishing the Stack, Boiler, Precipitator, Conveyor Section and Transfer Structure connecting to the Power Block from the Crusher Building, the Crusher Building, Dumper Building and any other structure that is above forty feet tall that is not being demolished with a high reach excavator. These written approaches shall not exceed one page each. They shall include enough details to understand how they will be safely demolished. Contractor shall note on each page how many times they have utilized each of these approaches with the same and team leader they would utilize to perform these higher risk activities at BCP.
- The pricing for this budget shall include the development of these very detailed work plans for each of these higher risk demolition approaches that are developed with your organization leading demolition SME and structural engineer. The contractor’s SME shall also be onsite during the final few days of preparations and execution on all non-explosive higher risk demolition approaches. If explosives are utilized, this same requirement applies to the master blaster.

2.3.3 Civil Scope

- ESCP Plan to include required ESCP plan elements from the Oregon DEQ 1200-C permit active during the time of permit application. The 1200-C permit is available on the DEQ’s website at <https://www.oregon.gov/deq/wq/wqpermits/Pages/Stormwater-Construction.aspx>.
- Manage wastewater and stormwater through the settling ponds
 - Contractor will pre-clean sludge from settling ponds. There is an estimated 10,000 CY of sludge.
 - Construct a berm towards the northeast up to the admin building and a second one towards the northwest to the railroad track direct stormwater to the settling ponds (should be incorporated into the ESCP Plan)
 - At project completion, let silt partially dry as necessary, in situ stabilization and backfill of settling ponds
 - Testing of wastewater/stormwater including turbidity and Ph and treatment and proper disposal, if required to meet applicable limits
 - Bury existing rip rap (rock) on the banks of the discharge channel
- Backfill electrical vaults, manholes, catch basins, etc. with crushed concrete backfill (500 psi flow fill concrete) up to 2' below grade (top 2' covered with soil)
- Fill large pits such as those left by removing the Dumper building with self-compacting stone (57 Stone)
- Sumps
 - Contractor to pump stormwater out of sumps and use sandy soil on site to discharge/allow to percolate
- Removal of overhead utilities where indicated on drawings to be removed

- All applicable piping shall be drained, and the contents properly disposed
- Backfill circulating water with 500 psi flow fill and bulkhead at the intake structure and discharge channel. Circulating water piping consists of prestressed concrete with bell and spigot ends.
- Demolish paved roads and asphalt, except for the road leading to the intake structure and coal yard loop associated with the rail line
- Asphalt from demolished roadways may not be used as clean fill unless it is crushed and blended with soil
- Immediate repair of damaged utilities that are to remain in service at no additional cost to owner
- Backfill site to match existing grade, with positive sheet drainage off the site to Carty Reservoir
- Recycled crush concrete (CAB) is to be used on site as a 3" cover, for example and in this order of priority:
 - Power Block Area including the ESP
 - Ash Handling area
 - Where other structures have been demolished and backfilled to grade
- Washwater Pond
 - Characterize the sludge
 - Excavate sludge (approximately 700 CY) completely including complete liner system (approximately 2' deep)
 - Dispose of off site
- Settling Basin for Clarifier
 - Break up concrete for reuse and backfill
 - Backfill to match final grade
- Sewage Lagoons
 - Stabilize lagoon solids
 - Excavate and dispose of solids, liner, and underlying soils
 - Grade berms and lagoons to existing
 - Seed and mulch
- Assume DSI System has a 3' deep slab and the stack slab is 20' deep. The turbine pedestal is on concrete.
- All backfilling shall be to 95% and placed in 8" lifts with contractor third party compaction verification provided by the contractor.
- Any underground utility work shall include GPR locate for capping, grout filling, removal with GPS coordinates noted on the 'As Builts'. Provide latitude, longitude, elevation of all capped utilities and bulkheads on these drawings with a corresponding photograph. This applies to all vertical (i.e. towards the surface) 2" diameter and 3" horizontal openings and greater as they relate to final grade that are also to be noted as documented QA/QC witness points in the demolition work plan.
- Coal yard will be covered with dirt and hydroseeded
 - Any damage to the coal yard during demolition must be repaired and reseeded

2.4 BCP Structures Scheduled for Removal and Restoration

A. Coal Handling East Area (Dumper Bldg. through TP4)

- UEB Building

- Dumper Building and Control, Rail Car Positioner, Rail Car Wash, and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Thaw Shed and Rail Line through (leave in place the rail that forks and diverts to the east exterior)
- Transfer Point #1 (TP1)
- Emergency Dump Structure and Reclaim Pit #1
- Transfer Point #2 (TP2)
- Conveyers from TP1 to TP4
- Transfer Point# 3 (TP3)
- Coal Yard Clarifier Buildings and Settling Basin
- Stacker/Reclaimer #2
- Transfer Point #4

B. Coal Handling West Area (Past TP4 through Crusher Building)

- Conveyers from TP4 to Crusher Building, including conveyor support structure
- Stacker/Reclaimer #3
- Transfer Point #5
- CHI Tanks
- Crusher Building
- Coal Yard Control Building
- Coal Yard Lunch Room
- 120V Distribution Box
- Sheds
- Reclaim Pit #2 and Light Tower

C. Power Block and Precipitator Stack (Including Stack and Admin Building)

- Conveyers from Crusher Building to Transfer Structure, including suspended conveyor supports
- Transfer Point Structure
- Precipitator Building and associated equipment
- Economizer Ash Storage Tank
- Stack
- North and South Drive Houses
- Activated Carbon System
- Warehouses 6 and 7
- Filtered Water Tank
- Neutralization Tank
- Flue Gas Conditioning Tank
- H2N2 Storage
- Aqueous Ammonia Tank
- Amine Tank

- Lube Oil Storage Tanks
- CO2 Storage
- Oil Storage Shed
- Power Block (Boiler, Turbine, Control, and Auxiliary Areas)
- Condensate Storage Tank
- Demineralization Water Storage Tank
- Admin Building/Warehouse

D. Ash Handling Equipment and Area

- Lube Oil Shed and Conex
- Warehouse 4
- Contractor Warehouse
- Scale
- Load Out Trailer and Unloading Bins
- Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, and Shed)
- Dry Sorbent Injection (DSI) System
- Waste Oil Storage Tank and Oil/Water Separator
- Maintenance Conexes
- Settling ponds (see Section 2.3.3)

E. Maintenance Area/Boneyard

- Fuel Island and building
- Sheds
- Bone Yard
- Vehicle Maintenance Building
- Railcar Maintenance Building and rail spur through
- Warehouse 2
- Warehouse 3
- Multi-Purpose Building
- Washwater Pond (see Section 2.3.3)
- Sewage lagoons

2.5 BCP Structures to Remain

BCP components to maintain include (see attached Figure 2A and 2B in Appendix J)

- 300,000-gallon potable/fire water tank and associate existing water pipeline
- 230 kV BCP to Dalreed transmission line
- 34.5 kV BCP to railroad crossing at Tower Road transmission line.
- 7.2 kV underground distribution line connecting BCP to the construction substation
- 12.5 kV underground distribution line connecting the construction substation to Boeing Well pump

- 480-volt underground distribution line connecting the 34.5 kV transmission line to the Carty Reservoir seepage pumps
- 500 kV Grassland to Slatt transmission line
- Carty Reservoir,
- Water Discharge Channel
- Intake Structure
- Boeing Well and pump
- Construction substation
- Tower road
- Evaporation ponds
- All rail throughout site, except for the two sections noted in 2.4 (dumper building/thaw shed and railcar maintenance). Protect rail throughout during demolition.
- Main Transformer and the associated rail leading to Transformer
- Helicopter pad and road leading to
- Fuel Oil Storage Tank

2.6 Bond Requirements

Performance and payment bonds are not required for this Budget Proposal submittal. Pricing is requested.

2.7 RFP BUDGET and Work Timeline

Note: This timeline will be updated after the site visit. This pre-budget RFP meeting will provide Respondents an opportunity to request clarification on the requirements of this Updated RFP Budget.

Clarifications from this meeting will be issued in written format to all participants.

Budgets Due Date: Respondent's Proposal are due on June 30, 2020.

Budget Proposal Schedule:

Updated RFP BUDGET Issuance June 9, 2020

Mandatory RFP BUDGET Pre-Budget meeting June 10, 2020

Site Walk Down (Power Block and Precipitator Areas only) June 10, 2020

Remaining RFP information: COB June 10, 2020

Questions from Respondents due June 17, 2020 at 5:00 PM PST

Answer provided by AECOM by June 24, 2020 at 5:00 PM PST

Budget Proposal Due Date June 30, 2020 at 5:00 PM EST

2.7.1 Operational Summary

The BCP property is currently fully operational and is operated and maintained by PGE and on-site contractors. BCP is responsible for demolition and construction activity on the site and is responsible for ensuring PGE activities on site are in compliance with applicable environmental regulations. The CGS property is adjacent to BCP and will remain fully operational after BCP decommissioning. Portions of the BCP property and the following systems are currently being utilized CGS and are not included in this scope of work (see Section 2.1.2).

2.8 Environmental Review

AECOM performed an initial review and evaluated the environmental compliance plans/permits, hazardous materials surveys and universal and or regulated waste management records associated with the site.

Existing Permits that apply to BCP Coal Handling area include, but not limited to;

Pricing for Permits and notifications required for this RFP Budget SOW include:

- Oregon 10-day notifications for asbestos abatement and demolition
- OSHA Pre-Eng Demo Survey
- ESCP (Erosion and Sediment Control Plan) See Section 2.3.3.
- Explosive felling permits and notifications (If applicable)

BCP Environmental SOW

- See Appendix C and Appendix H for summarized Environmentally Regulated Materials (ERM) survey information.

3. Respondent Qualifications

The Respondent must meet the following criteria:

- Past experience in reclamation and demolition projects.
- Experience with fossil power plant demolition. Provide a minimum of three and no more than ten.
- Specialized demolition subject matter expert (SME) resumes as it pertains to this SOW.

3.1 Respondent Technical Information Requirements

Respondent shall fill out the required information and provide the budget proposal to shannon.mackay@aecom.com. In addition, written Proposal required responses shall be included and numbered sections 1-8 and match the headings below. Respondent shall provide the Proposal and include the appropriate document naming convention to match the sections as outlined below. The detailed requirements of each section are contained below. Proposals may be provided in MS Word or PDF.

1. Filled out budget proposal Excel work sheets (Appendix D)
2. Project Staffing and SME
3. Licenses and Professional Registrations
4. Relevant Demolition Experience
5. Site Specific Plans Examples
6. Safety Record
7. Respondent Financial Information Requirements
8. Proposed Subcontractors

3.1.1 Requirement Descriptions

3.2.1.1 Profile of Respondent

Respondents are not required to fill out the Request for Qualifications Excel work sheet at this time. See Appendix H for example of qualifications that may be required.

3.1.1.1 Project Execution

In addition to past relevant project management experience, Respondent shall provide in budget Proposal the following for this project:

- Proposed method of demolition and specifically the higher risk elements that include;
 - Coal conveyors to tripper floor

- Coal unloader/stacker
- Boiler and Stack
- Any dismantlement activities that require crane and rigging
- Proposed material/equipment reclamation method and information
- Number of Planned shifts per day, length of shifts (Hours) and number of days per week
- Scope exclusions or exceptions
- Schedule and Lead Times
- Project Schedule

3.1.1.2 Exceptions to Company's Terms and Conditions for Services

PGE terms and conditions will not be provided for the purposes of this RFP Budget Proposal.

4. Proposal Instructions and Pricing

4.1 Submittal Instructions

Respondents must submit their budget proposals to the following:

Shannon MacKay
Sr. Environmental Scientist
D 206-438-2232 C 206-999-2112
shannon.mackay@aecom.com

Budget proposal shall be submitted in Excel Format (*.xls or *.xlsx) format or Adobe Acrobat (*.pdf) format.

4.2 Proposal Questions, Answers, and Addendum

Should Respondent find discrepancies or have any questions as to the meaning of any portion of the Bid Documents, please submit questions in accordance with the due dates for submittal of Respondent's Proposal set forth in this proposal. Respondent should note the following:

Respondent questions related to this budget RFP shall be submitted by email to Shannon MacKay at shannon.mackay@aecom.com

- Copies of all questions and answers will be provided anonymously without attribution for all Respondents to review.

Company will create a spreadsheet entitled "question and answer" and will be provided as a "addendum". Each Respondent is responsible for reviewing the Q&A document and shall become part of the budget RFP Addendum.

4.2.1 Addendum

Company will issue budget RFP Addendum #1 with supplemental information on or before June 24, 2020.

Company will issue additional addendum as warranted throughout the proposal process.

4.3 Pricing

Respondent shall provide a total dollar value for all labor, equipment, supervision, materials and incidental services to complete the Scope of Work. Provide pricing in the attached RFP Bid Form. All cells within bid form need to be completed.

Contractor shall include any other cost and service deemed necessary for a complete and accurate Proposal. Proposal shall be complete and must include all work that is indicated in the budget Documents, whether or not such work is expressly or fully detailed in the budget Documents. Respondent's failure to provide all required pricing will be considered non-responsive and the Proposal may be rejected. Total budget amount shall include the reclamation material deduct amount. Reclamation material deduct amount is not subject to change for the validity period of 90 days.

4.4 Additional RFP BUDGET Terms and Disclaimers

Please carefully review the following guidelines and terms that apply to this budget RFP.

4.4.1 Disclaimer

This is not a contract offer by PGE or AECOM; the budget RFP responses to this budget RFP do not bind PGE or AECOM in any way.

PGE and/or AECOM reserve the right to discontinue or modify the RFP Budget process at any time, and make no commitments, implied or otherwise, that this process will result in a business transaction or negotiation with one or more suppliers. All costs incurred by a supplier in preparing a response to this RFP BUDGET and in providing or obtaining additional information to or from AECOM shall be borne by the supplier.

4.4.2 Right of Rejection / Acceptance

Company reserves the right to reject any or all responses, to accept any response or to select any combination of responses. Company reserves the right to waive any irregularity contained in any response.

4.4.3 Documents

Company makes no representations or warranties regarding the accuracy or completeness of the information contained in this budget RFP, including the attachments. The supplier is responsible for making its own evaluation of information and data contained in this budget RFP and in preparing and submitting responses to this budget RFP. Each Respondent shall become fully acquainted with and understand the facility, challenges and restrictions associated with implementing the Scope of Work. Respondent shall thoroughly examine all of the Documents.

4.4.4 Confidentiality

Company will take reasonable precautions and use reasonable efforts to maintain the confidentiality of all responses submitted and will disclose such responses to its agents, employees, or consultants who have a need to know as is necessary for that agent, employee, or consultant to perform his/her function relating to the Project. Regardless of the confidentiality claimed, all such information may be subject to review by the appropriate state authority, or any other governmental authority or judicial body with jurisdiction relating to these matters and may be subject to discovery. Under such circumstances, Company will use reasonable efforts to protect Respondent's confidential information.

4.4.5 Exclusive Property of Company

This budget RFP and all proposals submitted to Company pursuant to this budget RFP shall become the exclusive property of Company and may be used for any reasonable purpose by Company. Use of this budget RFP, its content, or ancillary documents that may be provided at a later date for any and all purposes other than responding to this budget RFP are strictly prohibited.

Appendix D : RFP Bid Form

**PGE Boardman Demolition Budget RFP (Complete Demolition of Site)
 Schedule of Values**

Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices					
	Work Item	Quantity	\$/Unit	Firm, Fixed Price, \$	Completion Days
M9	Mobilization				
1	Pre Mobilization Plans as per Submittal Schedule in Attachment ??	Lump Sum			
2	Mobilization (Pre Work) Develop and conduct initial employee overall site and scope specific training	Lump Sum			
3	Higher Risk Plan Development and training cost development and cost on the day of activity	Lump Sum			
4	Overall and Higher Risk Site Training Cost By Professional 3rd Party	Lump Sum			
5	Pre Mobilization Activities (e.g. Permits, Licenses, NDA 40hr Certificate, OSHA training, etc.)	Lump Sum			
6	Mobilization (e.g. Equipment Transportation Cost, Job Trailer set up, etc.)	Lump Sum			
7	Temp water, electrical, and other site utility services	Lump Sum			
8	P&P Bond and Insurance (GL, Comp and Auto)	Lump Sum			
M9	Total Mobilization	Lump Sum		0	
A10	Total Decontamination				
1	Asbestos - Design, removal, and disposal cost	Lump Sum			
2	Lead - Design, removal, and disposal cost	Lump Sum			
5	Universal Waste - (light tubes and ballasts)	Lump Sum			
6	ESCP Design, Installation (Inc. all BMP) Maintenance and weekly inspections	Lump Sum			
7	Seismic Modeling by third party firm (if needed as determined by contractor)	Lump Sum			
8	Other (specify here _____)	Lump Sum			
9	Other (specify here _____)	Lump Sum			
A10	Total Decontamination	Lump Sum		0	
T74	Total Site Demolition and Restoration				
	A. Coal Handling East Area (Dumper Bldg. to TP4)				
1	UEB Building	Lump Sum			
2	Dumper Building and Control and Rail Car Positioner and Rail	Lump Sum			
3	Thaw Shed	Lump Sum			
4	Transfer Point #1 (TP1)	Lump Sum			
5	Emergency Dump Structure and Reclaim Pit #1	Lump Sum			
6	Transfer Point #2 (TP2)	Lump Sum			
7	Conveyers from TP1 to TP4	Lump Sum			
8	Transfer Point# 3 (TP3)	Lump Sum			
9	Coal Yard Clarifier Buildings and Settling Basin	Lump Sum			
10	Stacker/Reclaimer #2	Lump Sum			
11	Transfer Point #4	Lump Sum			
	B. Coal Handling West Area (Past TP4 to Crusher Building)				
12	Conveyers from TP4 to Crusher Building, including conveyor support	Lump Sum			
13	Stacker/Reclaimer #3	Lump Sum			
14	Transfer Point #5	Lump Sum			
15	CHI Tanks	Lump Sum			
16	Crusher Building	Lump Sum			
17	Coal Yard Control Building	Lump Sum			
18	Coal Yard Lunch Room	Lump Sum			
19	120V Distribution Box	Lump Sum			
20	Sheds	Lump Sum			

**PGE Boardman Demolition Budget RFP (Complete Demolition of Site)
Schedule of Values**

Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices					
	Work Item	Quantity	\$/Unit	Firm, Fixed Price, \$	Completion Days
21	Reclaim Pit #2 and Light Tower	Lump Sum			
	C. Power Block and Precipitator Area (Past Crusher Building to complete Power Block, including Precipitator and Stack)				
22	Conveyers from Crusher Building to Transfer Structure, including conveyor supports	Lump Sum			
23	Transfer Point Structure	Lump Sum			
24	Precipitator Building and associated equipment	Lump Sum			
25	Economizer Ash Storage Tank	Lump Sum			
26	Stack	Lump Sum			
27	North and South Drive Houses	Lump Sum			
28	Activated Carbon System	Lump Sum			
29	Warehouses 6 and 7	Lump Sum			
30	Filtered Water Tank	Lump Sum			
31	Neutralization Tank	Lump Sum			
32	Flue Gas Conditioning Tank	Lump Sum			
33	H2N2 Storage	Lump Sum			
34	Aqueous Ammonia Tank	Lump Sum			
35	Amine Tank	Lump Sum			
36	Lube Oil Storage Tanks	Lump Sum			
37	CO2 Storage	Lump Sum			
38	Oil Storage Shed	Lump Sum			
39	Power Block (Boiler, Turbine, Control, and Auxiliary Areas)	Lump Sum			
40	Condensate Storage Tank	Lump Sum			
41	Demineralization Water Storage Tank	Lump Sum			
42	Admin Building/Warehouse	Lump Sum			
	D. Ash Handling Equipment and Area				
43	Lube Oil Shed and Conex	Lump Sum			
44	Warehouse 4	Lump Sum			
45	Contractor Warehouse	Lump Sum			
46	Scale	Lump Sum			
47	Load Out Trailer and Unloading Bins	Lump Sum			
48	Ash Unloading Area (Fly Ash Silo, Dewatering Bins, Surge Tank, Settling Tank, and Shed)	Lump Sum			
49	Dry Sorbent Injection (DSI) System	Lump Sum			
50	Waste Oil Storage Tank and Oil/Water Separator	Lump Sum			
51	Maintenance Conexes	Lump Sum			
	E. Maintenance Boneyard Area North				
52	Fuel Island and building	Lump Sum			
53	Sheds	Lump Sum			
54	Bone Yard	Lump Sum			
55	Vehicle Maintenance Building	Lump Sum			
56	Railcar Maintenance Building and rail	Lump Sum			
57	Warehouse 2	Lump Sum			
58	Warehouse 3	Lump Sum			
59	Multi-Purpose Building	Lump Sum			

**PGE Boardman Demolition Budget RFP (Complete Demolition of Site)
 Schedule of Values**

Demolition, Decontamination, and Investment Recovery - Proposed Firm Fixed Prices					
	Work Item	Quantity	\$/Unit	Firm, Fixed Price, \$	Completion Days
	F. Civil and Site Restoration				
61	Sewage Lagoons (estimate 14,456 Ton for disposal of soils/sludge)	Lump Sum			
62	Settling Ponds in Area D (estimate 12,000 ton for removal/disposal of soil/sludge)	Lump Sum			
63	Equipment Wash water Pond - Area E (estimate 641 Ton for for disposal of soils/sludge)	Lump Sum			
64	Concrete Processing, Crushing and Placing over Areas C, D, and E at 3" think	Lump Sum			
65	3" of Top Soil and Hydro Seed over demolished and distributed areas A and B	Lump Sum			
66	Underground Utility Work locates before and after (Include GPR locate, GPS/Survey for 'As Built')	Lump Sum			
67	Underground Utility Capping based on 30 locations ranging from 4" to 11" Diameter	Lump Sum			
68	Underground Utility Capping based on 20 locations ranging from 12" to 36" Diameter	Lump Sum			
69	Bulkheading All Conveyor Tunnels at -2' Below Grade (BG)	Lump Sum			
70	Filling Manholes, Catch basins, Electrical vaults etc. with concrete and demo -2'BG	Lump Sum			
71	Intake and Discharge Tunnels flow fill 500psi and bulkhead intake	Lump Sum			
72	Backfill and Grading (See Site Restoration Quantities Woorksheet Tab 4)	Lump Sum			
73	Demobilization	Lump Sum			
T74	Total Site Demolition and Restoration	Lump Sum		0	
C67	Credit from Investment Recovery (See IR & Recycling Tab 3)	Lump Sum		\$ -	
N68	Net Proposal (Total Mob, Decontamination, Deactivation and Demolition - Credit from Investment Recovery)	Lump Sum		0	

**PGE Demolition Budget RFP
 Site Demolition Quantities**
 Please complete the tables below for Demolition Quantities at BCP Budget Coal Area

Debris Disposal Breakdown

Organic Debris	Tons	Cubic Yards	Trucking for Disposal				Disposal Facility		
			Loads	Cy/Ld	Tons/Ld	Truck Loads	Name	Address	Type of Facility
	Total								
Soft Demo Debries (pipe, duct insulation, built up roofing,\ etc.)									
Mixed Organic Debris (with metals or concrete)									
List Other -									
List Other -									
Sub-Total									

Crushed Concrete/AC for Backfill - Site Restoration

Inert Material	Tons	Cubic Yards	Trucking for Placement			
			Loads	Cy/Ld	Tons/Ld	Truck Loads
	Total					
Above Grade (AG) Concrete (e.g. elevated slabs and pedestals)						
Slab On Grade (SOG) concrete						
Below Grade (BG) concrete (e.g. footings and foundations) to -2' BG						
Asphaltic Concrete (AC)						
Soil (mixed w/AC or concrete)						
List Other -						
List Other -						
Sub-Total						0

	Tons	Cubic Yards
Total	0	0

	Truck Loads
Total	0

PGE Demolition Budget RFP Investment Recovery Quantities and Pricing

Please complete the tables below for Investment Recovery from Demolition Activities at BCP

Investment Recovery (IR) Breakdown

Non-Ferrous & Stainless	Total Pounds	Net Tons	Scrap Value \$	Approx. Handling & Transport Cost Per Lbs/Ton \$
90/10 CuNi Tubes			\$ -	\$ -
Monel B-163			\$ -	\$ -
Stainless Steel			\$ -	\$ -
#1 Copper Bright & Shinny			\$ -	\$ -
#2 Copper Shear Wire/Tubing			\$ -	\$ -
Copper Mix			\$ -	\$ -
Aluminum			\$ -	\$ -
Motors			\$ -	\$ -
List Other -			\$ -	\$ -
List Other -			\$ -	\$ -
Total Resale or Salvage Value			\$ -	\$ -

Scrap Metals Ferrous Metals	Total Pounds	Net Tons	Scrap Value \$	Approx. Handling & Transport Cost Per Lbs/Ton \$
Plate & Structural (P&S)			\$ -	\$ -
Unprepared P&S			\$ -	\$ -
Heavy Melting Steel (HMS) #1			\$ -	\$ -
HMS #2 (Unprepared)			\$ -	\$ -
Shreddable Steel (Tin)			\$ -	\$ -
List Other -			\$ -	\$ -
List Other -			\$ -	\$ -
Total Scrap Value			\$ -	\$ -

Investment Recovery Breakdown - Summary

Investment Recovery Items and Description Detail Equipment	Weight in Lbs		Value as is where is	Cost to Remove (All Handling Cost Labor and Transport)	Credit to PGE
	Each & Quantity	Total	Total \$	Total \$	
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -
			\$ -	\$ -	\$ -

Total IR credit \$ - \$ - \$ -

**PGE Demolition Budget RFP
 Site Restoration Quantities**

Please complete the tables below for Site Restoration at BCP Coal Area

Vendor Name:

Back Fill Areas	Flowable Fill (CY)	Self Compacting Stone	Soil (CY)
Coal Unloading Structure Basement & Escape Hatch			
Transfer Points 1 through 5			
Coal Reclaim Hoppers and Tunnels Qty 2			
Sewage Lagoons (estimate 24,094 CY for back fill)			
Settling Ponds in Area D (estimate 30,000 CY for back fill)			
Equipment Wash water Pond - Area E (estimate 1,200 CY for back fill)			
Other Sumps, Vaults, Trenches and/or other Basements			
Catch basins, Vaults, Man Holes, Trenches, etc. (40 locations)			
Other areas. Describe -			
Other areas. Describe -			
Other areas. Describe -			
Totals:	0	0	0

**PGE Demolition Budget RFP
 Asbestos-Containing Material Quantities**

Please complete the Unit Prices for Asbestos-Containing Material Quantities at BCP. Prices should include all permits, labor, SH&E, submittals, handling, and disposal of ACMs

Item #	Material	Location	Notes	Quantity	Unit	\$/Unit	Total Cost
1	Asphaltic coating on corrugated metal siding	Ash Unloading Area	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	28580	SF	\$0.00	\$0.00
2	Asphaltic coating on corrugated metal siding	Coal Conveyance System	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc. Some structures are suspended on metal supports up to ~80' height	43430	SF	\$0.00	\$0.00
3	Asphaltic coating on corrugated metal siding	Crusher Building	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	34000	SF	\$0.00	\$0.00
4	Asphaltic coating on corrugated metal siding	Dumper Building	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	11800	SF	\$0.00	\$0.00
5	Asphaltic coating on corrugated metal siding	Powerblock	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	355000	SF	\$0.00	\$0.00
6	Asphaltic coating on corrugated metal siding	Thaw Shed	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	29200	SF	\$0.00	\$0.00
7	Asphaltic coating on corrugated metal siding	Transfer Point 1	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	3588	SF	\$0.00	\$0.00
8	Asphaltic coating on corrugated metal siding	Transfer Point 2	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	9970	SF	\$0.00	\$0.00
9	Asphaltic coating on corrugated metal siding	Transfer Point 3	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	7040	SF	\$0.00	\$0.00
10	Asphaltic coating on corrugated metal siding	Transfer Point 4	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	6224	SF	\$0.00	\$0.00
11	Asphaltic coating on corrugated metal siding	Transfer Point 5	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	8946	SF	\$0.00	\$0.00
12	Asphaltic coating on corrugated metal siding	Precipitator Ground Level Structure	All caulking and seam sealants associated with this siding are also asbestos-containing, at seams, patch caulking, etc.	4000	SF	\$0.00	\$0.00
13	Gaskets	Throughout	There is no way to know how many gaskets are throughout the plant, this is an estimate for budgeting purposes number	5000	EA	\$0.00	\$0.00
14	Assumed asbestos-containing roofing/ Power Block	Power block roofs		77250	SF	\$0.00	\$0.00
15	Assumed asbestos-containing roofing/Admin Building (under membrane roofing)	Admin building		36,300	SF	\$0.00	\$0.00
16	Assumed asbestos-containing roofing/Yard Control Roof	Yard Control		1,600	SF	\$0.00	\$0.00
17	Asphaltic roofing with silver coating on sheds	Sheds on north end of coal yard		400	SF	\$0.00	\$0.00
18	Electrical panel backing	Throughout	There is no way to know how many electrical panels may have asbestos backing, this number is a guess	500	EA	\$0.00	\$0.00
19	Door caulking (interior and exterior caulking)	Powerblock doors throughout		217	EA	\$0.00	\$0.00
20	Various caulking throughout (not including the caulking related to the asphaltic coating on the corrugated metal siding)	Throughout		345	LF	\$0.00	\$0.00
21	Assumed fire doors throughout	Throughout		350	EA	\$0.00	\$0.00
22	Textured coating on roofing fan units	Power block roofs	16 ea (375 SF per unit) and 4 EA (60 SF per unit)	6240	SF	\$0.00	\$0.00
23	Joint compound and gypsum	Guard shacks and multi-purpose building		10,700	SF	\$0.00	\$0.00
24	Mirror mastic	Admin Building		4	EA	\$0.00	\$0.00
25	Sealants and caulking on Precipitator Roof	Precipitator	Not accessible at time of inspection, not quantified			\$0.00	\$0.00
26	Pin mastic	Admin Building and Stacker/Reclaimers		2280	SF	\$0.00	\$0.00
27	Interior and exterior seam caulking	Oil Storage shed, shed 1 (two sheds), and shed 2		2400	LF	\$0.00	\$0.00
28	Vibration isolators	Throughout		100	EA	\$0.00	\$0.00
29	Vinyl floor tile and mastic	Admin building, dumper building, and yard control building		3,200	SF	\$0.00	\$0.00
30	Black exterior window caulking	Admin building		1,270	LF	\$0.00	\$0.00
31	2"x2" and 4"x4" white ceramic tile and associated grout and mastic	Admin building		800	SF	\$0.00	\$0.00
						Total	\$0.00

**PGE Demolition Budget RFP
 Universal Waste Quantities and Pricing**

Please complete the Unit Prices for Universal Wastes Quantities at BCP

Component	Ash	Farm	Fire	Pumç	Intake	Str	Power	Blk	Dumper	E Admin	Bu	Lube	Oil	ξ Fuel	Islan	Crusher	E Boneyard	Street	Lig	Precipitat	Stack	Multi-Purç	Warehou:	Warehou:	Railcare	M Vehicle	M Coal	Con	Misc.	Totals	Unit Price	Unit	SubTotal
Mercury-containing light tubes (4')	46	8	18	1664	14	944	24	2	0	22	0	96	22	422	66	717	60	0	360	106	4591									EA	\$0.00		
Mercury-containing compact fluorescent lights	3	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	-	-	-	-	-	-	-	-	-	-	EA	\$0.00	
Light Ballasts	127	4	42	1633	141	525	12	1	66	11	16	312	24	220	58	397	73	7	798	160	4626.5								EA	\$0.00			
HID Lights (high pressure sodium and halide)	104	0	33	801	134	53	0	0	66	0	16	264	13	9	25	38	43	7	618	107	2331								EA	\$0.00			
Emergency (incandescent flood)	-	-	-	372	-	42	-	-	-	-	-	-	-	10	38	13	10	2	4	1	15	18	525							EA	\$0.00		
Strobe (LED strobe)	-	-	4	41	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	49							EA	\$0.00			
LED Lights	-	-	-	-	13	-	-	-	-	-	-	67	-	14	-	-	-	-	20	-	27	6	147						EA	\$0.00			
Other light fixtures	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	25						EA	\$0.00			
Mercury-containing switches	-	2	3	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EA	\$0.00		
Mercury-containing thermostats	5	-	-	7	-	6	-	-	1	-	-	-	-	4	-	-	-	-	-	-	10	1	34						EA	\$0.00			
Mercury-containing pressure gages	75	4	10	400	50	36	-	-	16	-	-	50	-	-	-	-	-	-	-	-	38	100	779						EA	\$0.00			
Batteries	-	-	-	6	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	9						EA	\$0.00			
Refrigerants	-	-	-	38	-	15	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	4	71						EA	\$0.00			
HVAC Units	5	-	-	7	2	2	1	-	2	-	-	8	-	5	4	6	10	-	-	-	11	63						EA	\$0.00				
Self-luminescent fire exit signs	4	-	-	-	-	18	-	-	-	-	-	-	-	31	4	4	4	4	4	-	8	77							EA	\$0.00			
Nuclear gages	-	-	-	14	5	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	23	1	53						EA	\$0.00			
Smoke Detectors	8	-	-	3	1	42	-	-	-	-	-	2	-	-	-	-	-	-	-	-	7	63							EA	\$0.00			
Identified Oil-filled transformers with PCB concentrations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	EA	\$0.00			
Total																			EA	\$0.00													

PGE Demolition Budget RFP

Example Work Plan Submittal Schedule

Please complete the tables below for Demolition Quantities at BCP Budget Coal Area

Project Environmental Plan (PEP)	Draft - 1 week after contract award Final – 2.5 weeks after contract award	Five days for each review, 2 PGE review cycle expected
Project Demolition Plan (PDP)	Draft - 1 week after contract award Final – 2.5 weeks after contract award	Five days for each review, 2 PGE review cycle expected
Specialized Demolition Approach (SDA) Plans	Draft - 1 week after contract award Final – 2.5 weeks after NTP	Five days for each review, 3 PGE review cycle expected
FAA Stack Lighting	Draft – 100 days before Demolition Final – 90 days before Demolition	FAA review for 90 days
Asbestos removal plan per National Emission Standards for Hazardous Air Pollutants (NESHAP), Oregon OSHA, and Oregon Department of Environmental Quality (DEQ) requirements	Draft - 1 week after contract award Final – 2.5 weeks after contract award	Five days for each review, 2 PGE review cycle expected; Submit to regulators 10 days prior to asbestos removal
Detailed Level 3 Baseline Project Schedule	Draft - 1 week after contract award Final - 3 weeks after contract award	Five days for each review, 3 PGE review cycle expected
Project Execution Plan (PXP) to include final grading plan	Draft - 1 week after contract award Final – 2.5 week after contract award	Five days for each review, 1 PGE review cycle expected
Project Training Plans ¹ which includes a review of the CSHP, PXP, PDP, PEP and JHA	Draft – 1.5 weeks after contract award. Final – 3 week after contract award	Five days for each review, 2 PGE review cycle expected.
¹ Specialized Demolition Approach (SDA) Training Plans (e.g. pull over; walk over, explosive felling, High Reach (HR) and Ultra High Reach (UHR), implosions, close demo that is well above equipment cab, critical lifts, controlled collapses etc.)	Draft - 5 weeks before crucial milestone execution day. Final – 2 weeks before execution.	Five days for each review, 2 PGE review cycles expected.
NOTE: The SDA training SHALL OCCUR either the day of the SDA, or the day before the SDA and always with the contractor and owners SDA SME in attendance for training and present for during the execution of all high-risk demolition activities. All SDA shall be schedule milestone dates that require 30 days advance notice and owners SDA SME approval before changing.		
Job Hazard Analysis (JHA)	Draft – 2.5 weeks before each applicable activity. Final – 1 week before activity begins	Five days for each review, 1 PGE review cycles expected.
Mobilization for Decontamination	After PGE review of the initial Health & Safety Plan, Environmental Plan, Asbestos removal plan, Project Schedule, Project Execution Plan, Decontamination Scope Specific Training, at least 3 weeks before event	N/A
Mobilization for Demolition	After Project Training Plans, but no later than 3 weeks after contract award	N/A

Appendix G : Demolition Safety Planning

Exhibit H – Safety

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- I. Preparatory Operations
 - II. Special Structures Demolition
 - III. Safe Blasting Procedures
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I. Preparatory Operations

Before the start of every demolition job, the demolition contractor should take a number of steps to safeguard the health and safety of workers at the job site. The demolition section of the OSHA standards is found at 29CFR§1926.850. The OSHA regulation primarily comprised wording and standards contained in the American National Standards Institute (ANSI) A10.6-1969 document. The OSHA standard has remained unchanged since its inception; however, the ANSI standard has been updated over the years, and the most current version is “Safety and Health Program Requirements for Demolition Operations” (ANSI/ASSE A10.6-2006). OSHA can only enforce its own standard, but it can rely on the current document for guidance where the original standard is silent or unclear.

Proper planning for a demolition project is critical to the project’s success and to the safety of the workers involved. The demolition plan should include means and methods to employ equipment, as well as types and quantities of equipment used on the project. The quality of the site inspection and pre-work planning is as important as the actual work. OSHA has made preparatory operations or preplanning the focus of the federal safety regulations pertaining to demolition operations in Subpart T of the OSHA construction safety standards. This requirement comes from many sources.

Section 4.1 of ANSI/ASSE A10.6- 2006 requires that:

“Prior to starting demolition operations, a written engineering survey of the structure shall be made by a qualified person to determine the type and condition of the framing, floors and walls so that actions can be taken if needed to prevent premature collapse of any portion of the structure. In addition an assessment of environmental hazards are noted and appropriate safeguards implemented to avert unsafe environmental exposures”

OSHA Standard 1926.850 (a) requires that “the employer shall have in writing evidence that such a survey has been performed.”

Section 3.1 of the National Demolition Association’s (NDA) Demolition Safety Manual states:

“During the preparation of the engineering survey, the contractor should address and plan for potential hazards and emergencies. If the structure to be demolished was damaged by fire, flood, explosion or some other cause, appropriate measures should be taken. This may include bracing and shoring of walls, floors and/or adjacent structures.”

The demolition contractors should be familiar with the proper steps for performing an engineering survey listed below.

A. Engineering Survey, Permits, Certification and Licensing

1. Prior to starting all demolition operations, OSHA Standard 29 CFR 1926.850(a) requires that a competent person must conduct an engineering survey of the structure. The purpose of this survey is to determine the condition of the framing, floors, and walls so that measures can be taken, if necessary, to prevent the premature collapse of any portion of the structure. When indicated as advisable, any adjacent structure(s) or improvements should also be similarly inspected. The demolition contractor must maintain a written copy of this survey. Photographing existing damage in neighboring structures is also advisable.
2. The engineering survey provides the demolition contractor with the opportunity to evaluate the job in its entirety. The contractor should plan for the wrecking of the structure, the equipment to do the work, work force requirements, and the protection of the public. The safety of all workers on the job site should be a prime consideration. During the preparation of the engineering survey, the contractor should plan for potential hazards such as fires, cave-ins, and injuries.
3. If the structure to be demolished has been damaged by fire, flood, explosion, or some other cause, appropriate measures, including bracing and shoring of walls and floors, shall be taken to protect workers and any adjacent structures. It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable material, or similar dangerous substances have been used or stored on the site. If the nature of a substance cannot be easily determined, samples should be taken and analyzed by a qualified person prior to demolition.
4. During the planning stage of the job, all safety equipment needs should be determined. The required number and type of respirators, lifelines, warning signs, safety nets, special face and eye protection, hearing protection, and other worker protection devices outlined in this manual should be determined during the preparation of the engineering survey. A comprehensive plan is necessary for any confined space entry.
5. As site conditions substantially change OSHA pre-engineering demolition survey shall be updated in accordance with OSHA Standard 1926.850, as defined below;
 - a) Prior to any interior demolition activities that remove any load bearing walls, creation of floor openings, or the need for handrails to be installed for all gutting, scrap sorting, segregation and salvage activities.
 - b) Prior to all structural demolition activities that include but is not limited to the former twelve story hotel, conference center and adjacent parking structure.
 - c) Upon completion of the structural demolition activities and prior to the remaining site demolition activities.
6. The contractor shall be required to provide one full time Project Manager that has completed and or is enrolled to complete the National Demolition Association's (NDA) 40-hour Foundations of Demolition Project Management course. Any and all crane operators or riggers shall be certified by an accredited origination. Documentation of all site activities that require any individual, equipment and or company certifications, licensing, specialized training and permits

by local, state and federal organizations shall be provided to the Owner for review two weeks before any related activities commence. A list of these certifications, licensing, specialized training and permits shall be provided in the Contractor's Project Execution Plan (PEP) with the date they expire or the date they are required before the related activity commences. For example, OSHA Engineering Survey, 10-Day Pre-demolition NESHAP, SWPPP, BMP's, Blasting Permit, etc. The dates for any required site, state or locally required permits, licensing, specialized training shall be noted on the project schedule with ample time for the Owner to review them.

7. Contractor is to develop Stormwater Pollution Prevention Plans (SWPPP) and drawings and install maintain and inspect BMP before structural demolition begins and during the course of the project shall be the sole responsibility of the contractor. All permitting cost for this and other related requirements shall be the sole responsibility of the contractor.

B. Utility Location

1. One of the most important elements of the pre-job planning is the location of all utility services. All electric, gas, water, steam, sewer, and other services lines should be shut off, capped, or otherwise controlled, at or outside the building before demolition work is started. In each case, any utility company that is involved should be notified in advance, and its approval or services, if necessary, shall be obtained.
2. If it is necessary to maintain any power, water, or other utilities during demolition, such lines shall be temporarily relocated as necessary and/or protected. The location of all overhead power sources should also be determined, as they can prove especially hazardous during any machine demolition. All workers should be informed of the location of any existing or relocated utility service.

C. Medical Services and First Aid

1. Prior to starting work, provisions should be made for prompt medical attention in case of serious injury. The nearest hospital, infirmary, clinic, or physician shall be located as part of the engineering survey. The job supervisor should be provided with instructions for the most direct route to these facilities. Proper equipment for prompt transportation of an injured worker, as well as a communication system to contact any necessary ambulance service, must be available at the job site. The telephone numbers of the hospitals, physicians, or ambulances shall be conspicuously posted.
2. In the absence of an infirmary, clinic, hospital, or physician that is reasonably accessible in terms of time and distance to the work site, a person who has a valid certificate in first aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training should be available at the work site to render first aid.
3. A properly stocked first aid kit as determined by an occupational physician, must be available at the job site. The first aid kit should contain approved supplies in a weatherproof container with individual sealed packages for each type of item. It should also include rubber gloves to prevent

the transfer of infectious diseases. Provisions should also be made to provide for quick drenching or flushing of the eyes should any person be working around corrosive materials. Eye flushing must be done with water containing no additives. The contents of the kit shall be checked before being sent out on each job and at least weekly to ensure the expended items are replaced.

4. **Police and Fire Contact.** The telephone numbers of the local police, ambulance, and fire departments should be available at each job site. This information can prove useful to the job supervisor in the event of any traffic problems, such as the movement of equipment to the job, uncontrolled fires, or other police/fire matters. The police number may also be used to report any vandalism, unlawful entry to the job site, or accidents requiring police assistance.

D. Fire Prevention and Protection

1. A "fire plan" should be set up prior to beginning a demolition job. This plan should outline the assignments of key personnel in the event of a fire and provide an evacuation plan for workers on the site. *Common sense* should be the general rule in all fire prevention planning, as follows:
 - All potential sources of ignition should be evaluated and the necessary corrective measures taken.
 - Electrical wiring and equipment for providing light, heat, or power should be installed by a competent person and inspected regularly.
 - Equipment powered by an internal combustion engine should be located so that the exhausts discharge well away from combustible materials and away from workers.
 - When the exhausts are piped outside the building, a clearance of at least six inches should be maintained between such piping and combustible material.
 - All internal combustion equipment should be shut down prior to refueling. Fuel for this equipment should be stored in a safe location.
 - Sufficient firefighting equipment should be located near any flammable or combustible liquid storage area.
 - Only approved containers and portable tanks should be used for the storage and handling of flammable and combustible liquids.
2. Heating devices should be situated so that they are not likely to overturn and shall be installed in accordance with their listing, including clearance to combustible material or equipment. Temporary heating equipment, when utilized, should be maintained by competent personnel.
3. Smoking should be prohibited at or in the vicinity of hazardous operations or materials. Where smoking is permitted, safe receptacles shall be provided for smoking materials.
4. Roadways between and around combustible storage piles should be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other materials. When storing debris or combustible material inside a structure, such storage shall not obstruct or adversely affect the means of exit.

5. A suitable location at the job site should be designated and provided with plans, emergency information, and equipment, as needed. Access for heavy fire-fighting equipment should be provided on the immediate job site at the start of the job and maintained until the job is completed.
6. Free access from the street to fire hydrants and to outside connections for standpipes, sprinklers, or other fire extinguishing equipment, whether permanent or temporary, should be provided and maintained at all times, as follows:
 - Pedestrian walkways should not be so constructed as to impede access to hydrants.
 - No material or construction should interfere with access to hydrants, Siamese connections, or fire-extinguishing equipment.
7. A temporary or permanent water supply of volume, duration, and pressure sufficient to operate the fire-fighting equipment properly should be made available. Standpipes with outlets should be provided on large multi story buildings to provide for fire protection on upper levels. If the water pressure is insufficient, a pump should also be provided.
8. An ample number of fully charged portable fire extinguishers should be provided throughout the operation. All motor-driven mobile equipment should be equipped with an approved fire extinguisher.
9. An alarm system, e.g., telephone system, siren, two-way radio, etc., shall be established in such a way that employees on the site and the local fire department can be alerted in case of an emergency. The alarm code and reporting instructions shall be conspicuously posted and the alarm system should be serviceable at the job site during the demolition. Fire cutoffs shall be retained in the buildings undergoing alterations or demolition until operations necessitate their removal.
10. During all demolition torch cutting activities, the Contractor shall provide qualified personnel to serve as on-site fire watch during building and construction demolition. The fire watch shall remain for thirty minutes after torch cutting activities to thoroughly inspect and wet areas to ensure there are no smoldering embers, wire or any flammable material.

II. Special Structures Demolition

A. Safe Work Practices When Demolishing a Chimney, Stack, Silo, or Cooling Tower

1. **Inspection and Planning.** When preparing to demolish any tall and or large structure, the first step must be a careful, detailed inspection of the structure by an experienced person. If possible, architectural/engineering drawings should be consulted. Particular attention should be paid to any condition that could place workers at risk. Workers should be on the lookout for any structural defects such as weak or acid-laden mortar joints, and any cracks or openings. The interior and/or exterior brickwork in some sections of a structure can become unstable as the structure is demolished which requires workers to stay away from the structure and to no longer enter and exit it.
2. **Safe Work Practice**

- a. When hand demolition is performed and requires a working platform.
 - Experienced personnel must install a self-supporting tubular scaffold, suspended platform, or knee-braced scaffolding around the chimney. Particular attention should be paid to the design, support, and tie-in (braces) of the scaffold.
 - A competent person should be present at all times during the erection of the scaffold.
 - It is essential that there be adequate working clearance between the chimney and the work platform.
 - Access to the top of the scaffold should be provided by means of portable walkways.
 - The platforms should be decked solid and the area from the work platform to the wall should be bridged with a minimum of two-inch thick lumber.
 - A back rail 42 inches above the platform, with a mid rail covered with canvas or mesh, should be installed around the perimeter of the platform to prevent injury to workers below. Debris netting may be installed below the platform.
 - Excess canvas or plywood attachments can form a wind-sail that could collapse the scaffold.
 - When working on the work platform, all personnel should wear hard hats, long-sleeve shirts, eye and face protection, such as goggles and face shields, respirators, and safety belts, as required.
 - Care should be taken to assign the proper number of workers to the task. Too many people on a small work platform can lead to accidents.
- b. An alternative to the erection of a self-supporting tubular steel scaffold is to "climb" the structure with a creeping bracket scaffold. Careful inspection of the masonry and a decision as to the safety of this alternative must be made by a competent person. It is essential that the masonry of the chimney be in good enough condition to support the bracket scaffold.
- c. The area around the structure should be roped off or barricaded and secured with appropriate warning signs posted. No unauthorized entry should be permitted to this area. It is also good practice to keep a worker, i.e., a supervisor, operating engineer, another worker, or a "safety person," on the ground with a form of communication to the workers above.
- d. Special attention should be paid to weather conditions. No work should be done during inclement weather such as during lightning or high wind situations. The work site should be wetted down, as needed, to control dust.

- e. Behavior Based Safety (BBS): The Contractor, all sub-contractors and vendors fulltime site resources shall provide two negative BBS observations each week. On an average, each BBS observation requires approximately two minutes to check the applicable box and to provide a few sentences per observation in a 'no name and no blame approach'. If a worker cannot write and/or speaks another language, their observation should be verbally provided to the Contractor's job clerk and/or their foreman or their site safety resource at a time that does not interfere with their daily work/production responsibilities.
 - f. BBS observations for the previous week are to be organized by the Contractor's site safety supervisor and summarized in a bar chart or pie chart. This dash board should summarize all the BBS information for the previous week and for the project to date and it shall be provided to the Owner by noon each Monday.
 - g. The weekly BBS observation summary will reveal areas that shall be discussed in the daily Contractor tailgate safety meeting the following week (i.e. Tuesday – Friday). Daily safety meeting and a required crew stretch with all full-time site resources should be at least 5 minutes each day.
3. **Debris Clearance.** If debris is dropped inside the shaft, it can be removed through an opening in the chimney at grade level.
- The opening at grade must be kept relatively small in order not to weaken the structure. If a larger opening is desired, a professional engineer should be consulted.
 - When removing debris by hand, an overhead canopy of adequate strength should be provided. If machines are used for removal of debris, proper overhead protection for the operator should be used.
 - Excessive debris should not be allowed to accumulate inside or outside the shaft of the chimney as the excess weight of the debris can impose pressure on the wall of the structure and might cause the shaft to collapse.
 - The foreman should determine when debris is to be removed, halt all demolition during debris removal, and make sure the area is clear of cleanup workers before continuing demolition.
4. **Demolition by Deliberate Collapse**
- Another method of demolishing a boiler, chimney or stack is by deliberate collapse. Deliberate collapse by "tripping" the structure which requires extensive pre-cutting to the point of near collapses which requires the workers to be inside and adjacent to the structure to make preparations, are prohibited. Additionally, in the utilization of other demolition approaches there must be a clear space for the fall of the structure of at least 45 degrees on each side of the intended fall line and 1½ times the total height of the chimney. Considerable vibration may be the result of a structure and or chimney impact, so there should be no sewers or underground services that are to remain in service on the line of the fall, that are not adequately protected. Public viewing will not

be allowed and all for explosive or non-explosive activities and the workers at the job site must be kept well back from the fall area.

- a. The use of explosives is allowed. only if it is undertaken only by qualified resources that have safety executed several similar size and scope projects in the last five years. . The entire work area shall be cleared of nonessential personnel before any explosives are placed. Though the use of explosives is a convenient method of bringing down a chimney or stack, there is a considerable amount of vibration produced, and caution should be taken if there is any likelihood of damage to remaining structures and sensitive electrical and other equipment.

5. Safe Work Practices When Working in Confined Spaces

- a. Demolition contractors often come in contact with confined spaces when demolishing structure at industrial sites. These confined spaces can be generally categorized in two major groups: those with open tops and a depth that restricts the natural movement of air, and enclosed spaces with very limited openings for entry. Examples of these spaces include storage tanks, vessels, degreasers, pits vaults, casing, and silos.
- b. The hazards encountered when entering and working in confined spaces are capable of causing bodily injury, illness, and death. Accidents occur among workers because of failure to recognize that a confined space is a potential hazard. It should therefore be considered that the most unfavorable situation exists in every case and that the danger of explosion, poisoning, and asphyxiation will be present at the onset of entry.

III. Safe Blasting Procedures

A. General Safe Work Practices

1. Blasting Survey and Site Preparation

- a. Prior to the blasting of any structure or portion thereof, a complete written survey must be made by a qualified person of all adjacent improvements and underground utilities. When there is a possibility of excessive vibration due to blasting operations, seismic or vibration tests should be taken to determine proper safety limits to prevent damage to adjacent or nearby buildings, utilities, or other property.
- b. If any explosive felling is utilized or the demolition that results in dropping a large structure near, Seismic modeling is required if it's within a one hundred yards of any remaining structures and sensitive electrical and other equipment. Seismic modeling will require geo technical data that shall be included in this cost. United States. Bureau of Mines (USMB) recommends that the Peak Particle Velocity (PPV) around 2 in/sec (50 mm/s) is recommended for the safety of adjacent structures and buildings, the contractor shall provide a budget to determine what the allowable PPV is for any sensitive electrical and other equipment, that shall not be exceeded.
- c. The preparation of a structure for demolition by explosives may require the removal of structural columns, beams or other building components. This work should be directed by a structural engineer or a competent person qualified to direct the removal of these

structural elements. Extreme caution must be taken during this preparatory work to prevent the weakening and premature collapse of the structure.

- d. The use of explosives to demolish boilers, smokestacks, silos, cooling towers, or similar structures should be permitted only if there is a minimum of 90 of open space extended for at least 150% of the height of the structure or if the explosives specialist can demonstrate consistent previous performance with tighter constraints at the site.

2. Fire Precautions

- a. The presence of fire near explosives presents a severe danger. Every effort should be made to ensure that fires or sparks do not occur near explosive materials. Smoking, matches, firearms, open flame lamps, and other fires, flame, or heat-producing devices must be prohibited in or near explosive magazines or in areas where explosives are being handled, transported, or used. In fact, persons working near explosives should not even carry matches, lighters, or other sources of sparks or flame. Open fires or flames should be prohibited within 100 feet of any explosive materials. In the event of a fire which is in imminent danger of contact with explosives, all employees must be removed to a safe area.
- b. Electrical detonators can be inadvertently triggered by stray RF (radio frequency) signals from two-way radios. RF signal sources should be restricted from or near to the demolition site, if electrical detonators are used.

3. Personnel Selection

- a. A blaster is a competent person who uses explosives. A blaster must be qualified by reason of training, knowledge, or experience in the field of transporting, storing, handling, and using explosives. In addition, the blaster should have a working knowledge of state and local regulations which pertain to explosives. Training courses are often available from manufacturers of explosives and blasting safety manuals are offered by the Institute of Makers of Explosives (IME) as well as other organizations.
- b. Blasters shall be required to furnish satisfactory evidence of competency in handling explosives and in safely performing the type of blasting required. A competent person should always be in charge of explosives and should be held responsible for enforcing all recommended safety precautions in connection with them.

B. Transportation of Explosives

1. Vehicle Safety

- a. Vehicles used for transporting explosives shall be strong enough to carry the load without difficulty, and shall be in good mechanical condition. All vehicles used for the transportation of explosives shall have tight floors, and any exposed spark-producing metal on the inside of the body shall be covered with wood or some other nonsparking material. Vehicles or conveyances transporting explosives shall only be driven by, and shall be under the supervision of, a licensed driver familiar with the local, state, and

Federal regulations governing the transportation of explosives. No passengers should be allowed in any vehicle transporting explosives.

- b. Explosives, blasting agents, and blasting supplies shall not be transported with other materials or cargoes. Blasting caps shall not be transported in the same vehicle with other explosives. If an open-bodied truck is used, the entire load should be completely covered with a fire and water-resistant tarpaulin to protect it from the elements. Vehicles carrying explosives should not be loaded beyond the manufacturer's safe capacity rating, and in no case should the explosives be piled higher than the closed sides and ends of the body.
- c. Every motor vehicle or conveyance used for transporting explosives shall be marked or placarded with warning signs required by OSHA and the DOT. Each vehicle used for transportation of explosives shall be equipped minimally with at least a ten-pound rated, serviceable ABC fire extinguisher. All drivers should be trained in the use of the extinguishers on their vehicle.
- d. In transporting explosives, congested traffic and high density population areas should be avoided, where possible, and no unnecessary stops should be made. Vehicles carrying explosives, blasting agents, or blasting supplies shall not be taken inside a garage or shop for repairs or servicing. No motor vehicle transporting explosives shall be left unattended.

C. Storage of Explosives

1. Inventory Handling and Safe Handling

- a. All explosives must be accounted for at all times and all not being used must be kept in a locked magazine. A complete detailed inventory of all explosives received and placed in, removed from, and returned to the magazine should be maintained at all times. Appropriate authorities must be notified of any loss, theft, or unauthorized entry into a magazine.
- b. Manufacturers' instructions for the safe handling and storage of explosives are ordinarily enclosed in each case of explosives. The specifics of storage and handling are best referred to these instructions and the aforementioned IME manuals. They should be carefully followed. Packages of explosives should not be handled roughly. Sparking metal tools should not be used to open wooden cases. Metallic slitters may be used for opening fiberboard cases, provided the metallic slitter does not come in contact with the metallic fasteners of the case.
- c. The oldest stock should always be used first to minimize the chance of deterioration from long storage. Loose explosives or broken, defective, or leaking packages can be hazardous and should be segregated and properly disposed of in accordance with the specific instructions of the manufacturer. If the explosives are in good condition it may be advisable to repack them. In this case, the explosives supplier should be contacted. Explosives cases should not be opened or explosives packed or repacked while in a magazine.

2. Storage Conditions

- a. Providing a dry, well-ventilated place for the storage of explosives is one of the most important and effective safety measures. Exposure to weather damages most kinds of explosives, especially dynamite and caps. Every precaution should be taken to keep them dry and relatively cool. Dampness or excess humidity may be the cause of misfires resulting in injury or loss of life. Explosives should be stored in properly constructed fire and bullet-resistant structures, located according to the IME American Table of Distances and kept locked at all times except when opened for use by an authorized person. Explosives should not be left, kept, or stored where children, unauthorized persons, or animals have access to them, nor should they be stored in or near a residence.
- b. Detonators should be stored in a separate magazine located according to the IME American Table of Distances. *DETONATORS SHOULD NEVER BE STORED IN THE SAME MAGAZINE WITH ANY OTHER KIND OF EXPLOSIVES.*
- c. Ideally, arrangements should be made whereby the supplier delivers the explosives to the job site in quantities which will be used up during the work day. An alternative would be for the supplier to return to pick up unused quantities of explosives. If it is necessary for the contractor to store his explosives, he should be familiar with all local requirements for such storage.

D. Proper Use of Explosives

1. Blasting operations shall be conducted between sunup and sundown, whenever possible. Adequate signs should be sounded to alert to the hazard presented by blasting. Blasting mats or other containment should be used where there is danger of rocks or other debris being thrown into the air or where there are buildings or transportation systems nearby. Care should be taken to make sure mats and other protection do not disturb the connections to electrical blasting caps.
2. Radio, television, and radar transmitters create fields of electrical energy that can, under exceptional circumstances, detonate electric blasting caps. Certain precautions must be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous or static electricity. These precautions shall include:
 - Ensuring that mobile radio transmitters on the job site that are less than 100 feet away from electric blasting caps, in other than original containers, shall be de-energized and effectively locked.
 - The prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of the blasting operations.
 - Maintaining the minimum distances recommended by the IME between the nearest transmitter and electric blasting caps.

- The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
- After loading is completed, there should be as little delay as possible before firing. Each blast should be fired under the direct supervision of the blaster, who should inspect all connections before firing and who should personally see that all persons are in the clear before giving the order to fire. Standard signals, which indicate that a blast is about to be fired and a later all-clear signal shall have been adopted. It is important that everyone working in the area be familiar with these signals and that they be strictly obeyed.

3. **Procedures After Blasting**

1. **Inspection After the Blast.** Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine and short-circuited. Where power switches are used, they shall be locked open or in the off position. Sufficient time shall be allowed for dust, smoke, and fumes to leave the blasted area before returning to the spot. An inspection of the area and the surrounding rubble shall be made by the blaster to determine if all charges have been exploded before employees are allowed to return to the operation. All wires should be traced and the search for unexploded cartridges made by the blaster.

2. **Disposal of Explosives**

- a. Explosives, blasting agents, and blasting supplies that are obviously deteriorated or damaged should not be used, they should be properly disposed of. Explosives distributors will usually take back old stock. Local fire marshals or representatives of the United States Bureau of Mines may also arrange for its disposal. Under no circumstances should any explosives be abandoned.
- b. Wood, paper, fiber, or other materials that have contained high explosives should not be used again for any purpose, but should be destroyed by burning. These materials should not be burned in a stove, fireplace, or other confined space. Rather, they should be burned at an isolated outdoor location, at a safe distance from thoroughfares, magazines, and other structures. It is important to check that the containers are entirely empty before burning. During burning, the area should be adequately protected from intruders and all persons kept at least 100 feet from the fire.

PGE Boardman

Estimate of Salvageable Material Weights, Concrete and Structural Steel

March 20, 2020



Estimate Memorandum

From: AECOM, Program Cost Consultancy

Date: March 20, 2020

Subject: PGE Boardman, Estimate of Salvageable Material Weights, Structural Steel & Concrete

To: Tim Barker, Nicole Gladu, Shannon MacKay

Contained herein is the estimate of salvageable material weights for the PGE Boardman plant, located in Boardman, OR. The estimate is based on the as-built construction documents, as well as supplementary information such as site photographs and various discussions with AECOM project management staff. Included with this package are a basis of estimate report, summaries of material weights, and detailed backup to the summaries including digital quantity takeoffs.

Respectfully,

A handwritten signature in blue ink, appearing to read 'Russell Link'.

Russell Link, CEP

Cost Estimator, AECOM



Introduction

AECOM Program Cost Consultancy was tasked with providing a class II estimate of salvageable material weights for the demolition of the PGE Boardman in Boardman, OR. In the process of creating this estimate of salvageable material weights, a review of the available documentation was performed. This review included 1,770 structural drawings made up of 1,254 sheets containing Bills of Lading, as well as 516 drawings in which manual quantity takeoff would potentially need to be performed. Following this review, it was determined that the estimating effort would be broken down by facility and into two major categories per facility:

1. Structural Steel

A detailed quantity takeoff of Structural Steel for the various structures was performed. This takeoff is included in the report totals as noted below. To serve as backup to this summarization, quantities have been provided for each associated facility along with the overlaid digital quantity takeoff.

Where possible, Structural Steel quantities were taken off by individual member for Floor Framing, Columns, Bracing/Girt Framing, Decking, etc.

2. Concrete

A detailed quantity takeoff of the Concrete to 2' below grade for the various facilities was performed. To serve as backup to this summarization, quantities have been provided for each associated facility along with the overlaid digital quantity takeoff.

It should be noted a takeoff or calculation of reinforcing steel contained within the concrete has not been included. Concrete quantities were calculated to an overall cubic yard volume.



Conclusion:

In conclusion, we have determined that the total weights of salvageable materials within this facility based on our detailed review of the drawings provided, are as follows:

Structural Steel Total:

11,450 Tons

Concrete Total:

42,198 Cubic Yards

84,397 Tons (based on 4,000 lb. per y3)

The above totals are broken down by facility as follows:

- 500 KV Line Tower
 - Structural Steel: 43 Tons
- Admin and Warehouse Building
 - Structural Steel: 113 Tons
 - Concrete: 1051 CY
- Ash Hopper
 - Concrete: 35 CY
- Auxiliary Service Building
 - Structural Steel: 148 Tons
- Coal Silos
 - Structural Steel: 18 Tons
 - Concrete: 72 CY
- Condenser Pit
 - Structural Steel: 17 Tons
 - Concrete: 162 CY
- Control Center Complex
 - Concrete: 117 CY
- Crusher Building
 - Structural Steel: 62 Tons
 - Concrete: 702 CY
- Dam Spillway
 - Concrete: 15,141 CY

Basis of Estimate
PGE Boardman Estimate of Salvageable Material Weights, Structural Steel & Concrete



- DSI System
 - Structural Steel: 51 Ton
- East Coal Conveyance
 - Structural Steel: 276 Tons
 - Concrete: 262 CY
- Electrical Shop Monorail
 - Structural Steel: 2 Tons
- HVAC Condenser Penthouse
 - Concrete: 18 CY
- Intake Structure
 - Concrete: 367 CY
- Pawnee Unit
 - Structural Steel: 88 Tons
 - Concrete: 308 CY
- Power Block Boiler
 - Structural Steel: 2,615 Tons
 - Concrete: 2,746 CY
- Power Block Crane Columns Turbine Bay Bills of Lading
 - Structural Steel: 22 Tons
- Power Block Foundation
 - Structural Steel: 24 Tons
 - Concrete: 343 CY
- Power Block
 - Structural Steel: 3,395 Tons
 - Concrete: 6,553 CY
- Precipitator
 - Structural Steel: 329 Tons
 - Concrete: 503 CY
- Rail Car Wash
 - Structural Steel: 2 Tons
 - Concrete: 203 CY
- Settling Basin
 - Structural Steel: 3 Tons
 - Concrete: 5 CY
- Stack
 - Structural Steel: 23 Tons
 - Concrete: 5,943 CY
- Transfer Structure
 - Structural Steel: 809 Tons
 - Concrete: 2,924 CY

Basis of Estimate
PGE Boardman Estimate of Salvageable Material Weights, Structural Steel & Concrete



- Turbine Building
 - Concrete: 907 CY
- UEB Building
 - Structural Steel: 9 Tons
- Miscellaneous Metals Allowance
 - Structural Steel: 402 Tons
 - Concrete:
- Misc. Bills of Lading
 - Structural Steel: 2,152 Tons
- Contingency, 10%
 - Structural Steel: 845 Tons
 - Concrete: 3,836 CY

PGE BOARDMAN

TOTAL SALVAGE SUMMARY			
Structural Steel Tonnage	Concrete y3	Concrete Tonnage	Total Tonnage
11,450	42,198	84,397	95,847

STRUCTURAL STEEL & CONCRETE					
		Concrete y3	Concrete tn	Steel tn	Total tn
1	500 KV Line Tower		0	43	43
2	Admin and Warehouse Building	1,051	2,102	113	2,215
3	Ash Hopper	35	70		70
4	Auxillary Service Building		0	148	148
5	Coal Silos	72	144	18	162
6	Condenser Pit	162	324	17	341
7	Control Center Complex	117	234	0	234
8	Crusher Building	702	1,404	62	1,466
9	Dam Spillway	15,141	30,282	0	30,282
10	DSI System	0	0	51	51
11	East Coal Conveyance	262	524	276	800
12	Electrical Shop Monorail		0	2	2
13	HVAC Condenser Penthouse	18	36		36
14	Intake Structure	367	734		734
15	Pawnee Unit	308	616	88	704
16	Power Block Boiler	2,746	5,492	2,615	8,107
17	Power Block Crane Columns Turbine Bay Bills of Lading		0	22	22
18	Power Block Foundation	343	686	24	710
19	Power Block	6,553	13,106	3,395	16,501
20	Precipitator	503	1,007	329	1,336
21	Rail Car Wash	203	406	2	408
22	Settling Basin	5	10	3	13
23	Stack	5,943	11,886	23	11,909
24	Transfer Structure	2,924	5,847	809	6,656
25	Turbine Building	907	1,814		1,814
26	UEB Building		0	9	9
27	Miscellaneous Metals Allowance, Base Plates, Connections, Stiffeners, Etc.		0	402	402
28	Bills of Lading		0	2,152	2,152
29	Contingency	10%	3,836	7,672	8,518
	TOTAL Ton	42,198	84,397	11,450	95,847

Concrete is based upon 4000lbs per y3

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Boardman Cost of Removal Calculation

	Schedule 145				
	COR	Salvage	Severance	Retention	Total
Boardman Plant Decommissioning					
Planning & Design	1,800,000				1,800,000
Decommissioning	2,500,000				2,500,000
Coal Yard Reclamation	2,750,000				2,750,000
ADA Closure	8,446,000				8,446,000
Environmental Assessment	400,000				400,000
ERM abatement	7,247,000				7,247,000
Demolition	25,504,000				25,504,000
Construction Mgmt.	2,692,325				2,692,325
Rail Car Termination	447,000				447,000
Inventory EOL Removal	8,100,000				8,100,000
Site Security	250,000				250,000
Subtotal in 2020\$	60,136,325	-	-	-	60,136,325
Contingency	5,134,000				5,134,000
Scrap		(6,638,000)			(6,638,000)
Severance/Retention			6,944,000	8,397,000	15,341,000
Total Boardman Decommissioning 2020\$	65,270,000	(6,638,000)	6,944,000	8,397,000	73,973,000
Escalated to Nominal Cash Flows	67,621,000	(6,638,000)	6,944,000	8,397,000	76,324,000
PGE Share (90%)	0.9	0.9	0.9	0.9	
Total Boardman Decommissioning	60,859,000	(5,974,000)	6,250,000	7,557,000	68,692,000
Site O&M & Groundwater Monitoring					
Groundwater Monitoring	2,355,000				2,355,000
Landfill O&M	195,000				195,000
Vegetation Management	150,000				150,000
Subtotal - Site O&M & Groundwater Monitoring 2020\$	2,700,000	-	-	-	2,700,000
Escalated to Nominal Cash Flows	3,784,000	-	-	-	3,784,000
PGE Share (90%)	0.9	0.9	0.9	0.9	
Total Site O&M & Groundwater Monitoring	3,406,000	-	-	-	3,406,000
Grand Total	64,265,000	(5,974,000)	6,250,000	7,557,000	72,098,000
Adjustments per Schedule 145:					
Excluded amount (per Commission Order No. 14-169)	(1,135,543)				(1,135,543)
Reduce collection by amounts recv'd from PRC	(3,600,000)			(1,000,000)	(4,600,000)
Total to Collect per Sch. 145	59,529,457	(5,974,000)	6,250,000	6,557,000	66,362,457
Sch. 145 Collections to Date	(66,356,135)	15,972,300	(7,887,558)	(7,999,993)	(66,271,387)
Total Remaining to Collect - 12/31/20	(6,826,678)	9,998,300	(1,637,558)	(1,442,993)	91,071

Boardman COR Cash Flows by Quarter

September 2020 Estimate

Description of Work	Incurred through Q3		2020					2021					2022					2023					2024-2050	Total Including Settlements		
	2020 (100%)	2020	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4							
Planning & Design	1,782,727	58,745	37,514	38,705	38,705	38,705	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,995,101		
Coal Yard Reclamation	2,240,645	612,253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,852,898	
Ash Disposal Area Closure	131,759	-	5,019,508	1,570,293	1,496,475	20,436	19,817	20,126	20,436	20,126	20,127	20,127	20,126	19,817	-	-	-	-	-	-	-	-	-	-	8,399,173	
Decommissioning	415,318	1,418,249	311,450	323,203	317,229	317,229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,102,678	
Demolition	294,051	176,017	171,349	173,470	167,106	167,106	5,006,262	5,081,874	5,157,486	5,081,874	5,081,874	5,081,874	5,081,874	3,569,638	-	-	-	-	-	-	-	-	-	-	40,291,852	
Environmental Assessment/Cleanup	13,355	130,026	257,954	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	401,335	
Inventory End of Life	-	8,100,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,100,000	
Site Security	-	-	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	20,833	-	250,000	
Subtotal - Boardman Decom	4,877,856	10,495,290	5,818,608	2,126,504	2,040,348	564,309	5,046,912	5,122,833	5,198,755	5,122,833	5,122,834	5,122,834	5,122,833	3,610,288	-	-	-	-	-	-	-	-	-	-	65,393,038	2020\$ - 100%
Groundwater Monitoring	-	-	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	22,500	2,430,000	-	-	-	-	-	-	-	-	-	2,700,000	
Grand Total - 2020\$	4,877,856	10,495,290	5,841,108	2,149,004	2,062,848	586,809	5,069,412	5,145,333	5,221,255	5,145,333	5,145,334	5,145,334	5,145,333	3,632,788	2,430,000	-	-	-	-	-	-	-	-	-	68,093,038	2020\$ - 100%

122,713

Cash Flows By Quarter - Boardman Decommissioning

Total - 2020\$	2020		2021					2022					2023				
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Escalation	1,000	1,023	1,023	1,023	1,023	1,042	1,042	1,042	1,042	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059
	\$ 15,373,146	\$ 5,951,075	\$ 2,174,916	\$ 2,086,799	\$ 577,156	\$ 5,260,495	\$ 5,339,629	\$ 5,418,764	\$ 5,339,629	\$ 5,425,300	\$ 5,425,300	\$ 5,425,299	\$ 3,823,449				
PGE Share (90%)	\$ 13,835,831	\$ 5,355,967	\$ 1,957,425	\$ 1,878,119	\$ 519,441	\$ 4,734,445	\$ 4,805,666	\$ 4,876,887	\$ 4,805,666	\$ 4,882,770	\$ 4,882,770	\$ 4,882,769	\$ 3,441,104	64,642,422			

Per Study	Adj	COR	Salvage	Severance	Retention	Total	Comment	Category	Per Study	Per CF Schedule	Difference
Planning & Design	-	1,800,000	-	-	-	1,800,000		Planning & Design	1,800,000	1,995,101	195,101
Decommissioning	-	2,500,000	-	-	-	2,500,000		Coal Yard Reclamation	2,750,000	2,852,898	102,898
Coal Yard Reclamation	-	2,750,000	-	-	-	2,750,000		ADA Closure	8,446,000	8,399,173	(46,827)
ADA Closure	-	8,446,000	-	-	-	8,446,000		Decommissioning	2,947,000	3,102,678	155,678
Environmental Assessment	-	400,000	-	-	-	400,000		Demolition	40,577,325	40,291,852	(285,473)
ERM abatement	-	7,247,000	-	-	-	7,247,000		Environmental Assessment/ Ci	400,000	401,335	1,335
Demolition	-	25,504,000	-	-	-	25,504,000		Site Security	250,000	250,000	-
Demo Scrap Credit	-	-	(5,828,000)	-	-	(5,828,000)					
Construction Mgmt.	(582,675)	2,692,325	-	-	-	2,692,325	Adjusted based on input from Environmental Services	Total Decommissioning	57,170,325	57,293,038	122,713
Severance	1,536,000	-	-	15,341,000	-	15,341,000	Adjusted for updated estimate of Sev/Ret				
Rail Car Termination	-	447,000	-	-	-	447,000		Ongoing O&M (GW Monitoring)	2,700,000	2,700,000	-
Inventory EOL Removal	-	8,100,000	-	-	-	8,100,000		Total	59,870,325	59,993,038	122,713
Inventory Scrap Credit	-	-	(810,000)	-	-	(810,000)					
Site Security	-	250,000	-	-	-	250,000					
Ongoing O&M (GW Monitoring)	(1,098,000)	2,700,000	-	-	-	2,700,000	Adjust to 2020\$. \$3.8M is nominal amount				
10% contingency	1,531,000	5,134,000	-	-	-	5,134,000	Adjust contingency to include all COR.				
75,287,000	1,386,325	67,970,325	(6,638,000)	15,341,000	-	76,673,325	2020\$ 100%				

Boardman Decom (less: Contingency)

60,136,325 2020\$ 100%

ARO Cash Flows - Boardman Groundwater Monitoring & Maintenance

Year	GW Monitoring	Landfill O&M	Vegetation Management	Total	Escalation	Nominal Cash Flow	PGE Share (90%)
2020	-	-	-	-	1.000	-	-
2021	78,500	6,500	5,000	90,000	1.023	92,049	82,844
2022	78,500	6,500	5,000	90,000	1.042	93,809	84,428
2023	78,500	6,500	5,000	90,000	1.059	95,314	85,782
2024	78,500	6,500	5,000	90,000	1.078	97,020	87,318
2025	78,500	6,500	5,000	90,000	1.100	99,033	89,130
2026	78,500	6,500	5,000	90,000	1.126	101,359	91,223
2027	78,500	6,500	5,000	90,000	1.154	103,841	93,456
2028	78,500	6,500	5,000	90,000	1.182	106,341	95,707
2029	78,500	6,500	5,000	90,000	1.209	108,801	97,921
2030	78,500	6,500	5,000	90,000	1.236	111,235	100,112
2031	78,500	6,500	5,000	90,000	1.262	113,589	102,230
2032	78,500	6,500	5,000	90,000	1.288	115,927	104,334
2033	78,500	6,500	5,000	90,000	1.314	118,249	106,424
2034	78,500	6,500	5,000	90,000	1.340	120,640	108,576
2035	78,500	6,500	5,000	90,000	1.368	123,089	110,780
2036	78,500	6,500	5,000	90,000	1.395	125,541	112,987
2037	78,500	6,500	5,000	90,000	1.423	128,084	115,276
2038	78,500	6,500	5,000	90,000	1.452	130,711	117,640
2039	78,500	6,500	5,000	90,000	1.482	133,357	120,021
2040	78,500	6,500	5,000	90,000	1.512	136,093	122,484
2041	78,500	6,500	5,000	90,000	1.543	138,913	125,022
2042	78,500	6,500	5,000	90,000	1.576	141,804	127,624
2043	78,500	6,500	5,000	90,000	1.609	144,768	130,291
2044	78,500	6,500	5,000	90,000	1.642	147,813	133,031
2045	78,500	6,500	5,000	90,000	1.677	150,966	135,870
2046	78,500	6,500	5,000	90,000	1.713	154,206	138,786
2047	78,500	6,500	5,000	90,000	1.750	157,532	141,779
2048	78,500	6,500	5,000	90,000	1.788	160,940	144,846
2049	78,500	6,500	5,000	90,000	1.827	164,459	148,013
2050	78,500	6,500	5,000	90,000	1.868	168,079	151,271
	2,355,000	195,000	150,000	2,700,000		3,783,561	3,405,205

Source: IHS Global Insight: "The US Economy-The 30-Year Focus"
P&W1A, May 2020
Consumer Prices, All-Urban

	1982-84 = 1	2018 = 1	2020 = 1
2005	1.953		
2006	2.016		
2007	2.073		
2008	2.153		
2009	2.146		
2010	2.181		
2011	2.249		
2012	2.296		
2013	2.330		
2014	2.367		
2015	2.370		
2016	2.400		
2017	2.451		
2018	2.511	1.000	
2019	2.557	1.018	
2020	2.582	1.028	1.000
2021	2.641	1.052	1.023
2022	2.691	1.072	1.042
2023	2.735	1.089	1.059
2024	2.783	1.108	1.078
2025	2.841	1.131	1.100
2026	2.908	1.158	1.126
2027	2.979	1.186	1.154
2028	3.051	1.215	1.182
2029	3.121	1.243	1.209
2030	3.191	1.271	1.236
2031	3.259	1.298	1.262
2032	3.326	1.325	1.288
2033	3.393	1.351	1.314
2034	3.461	1.378	1.340
2035	3.531	1.406	1.368
2036	3.602	1.434	1.395
2037	3.675	1.463	1.423
2038	3.750	1.493	1.452
2039	3.826	1.524	1.482
2040	3.904	1.555	1.512
2041	3.985	1.587	1.543
2042	4.068	1.620	1.576
2043	4.153	1.654	1.609
2044	4.241	1.689	1.642
2045	4.331	1.725	1.677
2046	4.424	1.762	1.713
2047	4.520	1.800	1.750
2048	4.617	1.839	1.788
2049	4.718	1.879	1.827
2050	4.822	1.920	1.868

August 2020


The 30-Year Focus • Third Quarter

Trend Forecast

2020|Third Qtr

Welcome to IHS Markit's supplementary data to "The 30 Year Focus." Contained in the worksheets that follow, you will find annual tables for over 40 sets of concepts, including GNP, housing, trade, financial markets, and much more.

From the "Contents" sheet which immediately follows, you can find a quick reference to the table you want. If your program supports hyperlinks, you can also use them to navigate between individual tables and the table of contents. We hope you find this product useful, and we welcome your feedback.



	January	February	March	April
Sales to Consumers	\$ 166	\$ 166	\$ 166	\$ 166
Sales for Resale	\$ -	\$ -	\$ -	\$ -
Other Revenues	\$ -	\$ -	\$ -	\$ -
Total Operating Revenues	\$ 166	\$ 166	\$ 166	\$ 166
Net Variable Power Costs	\$ -	\$ -	\$ -	\$ -
Production O&M (Excludes Trojan)	\$ -	\$ -	\$ -	\$ -
Trojan O&M	\$ -	\$ -	\$ -	\$ -
Transmission O&M	\$ -	\$ -	\$ -	\$ -
Distribution O&M	\$ -	\$ -	\$ -	\$ -
Customer & MBC O&M	\$ -	\$ -	\$ -	\$ -
Uncollectibles Expense	\$ 1	\$ 1	\$ 1	\$ 1
OPUC Fees	\$ 1	\$ 1	\$ 1	\$ 1
A&G, Ins/Bene., & Gen. Plant	\$ -	\$ -	\$ -	\$ -
Total Operating & Maintenance	\$ 1	\$ 1	\$ 1	\$ 1
Depreciation	\$ 160	\$ 160	\$ 160	\$ 160
Amortization	\$ -	\$ -	\$ -	\$ -
Property Tax	\$ -	\$ -	\$ -	\$ -
Payroll Tax	\$ -	\$ -	\$ -	\$ -
Other Taxes	\$ -	\$ -	\$ -	\$ -
Franchise Fees	\$ 4	\$ 4	\$ 4	\$ 4
Utility Income Tax	\$ 0	\$ 0	\$ 0	\$ 0
Total Operating Expenses & Taxes	\$ 166	\$ 166	\$ 166	\$ 166
Utility Operating Income	\$ 0	\$ 0	\$ 0	\$ 0
Average Rate Base				
Avg. Gross Plant	\$ -	\$ -	\$ -	\$ -
Avg. Accum. Deprec. / Amort	\$ -	\$ -	\$ -	\$ -
Avg. Accum. Def Tax	\$ -	\$ -	\$ -	\$ -
Avg. Accum. Def ITC	\$ -	\$ -	\$ -	\$ -
Avg. Net Utility Plant	\$ -	\$ -	\$ -	\$ -
Misc. Deferred Debits	\$ -	\$ -	\$ -	\$ -
Operating Materials & Fuel	\$ -	\$ -	\$ -	\$ -
Misc. Deferred Credits	\$ -	\$ -	\$ -	\$ -
Working Cash	\$ 6	\$ 6	\$ 6	\$ 6

Average Rate Base	\$	6	\$	6	\$	6	\$	6
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Rate of Return
Implied Return on Equity

Effective Cost of Debt	5.100%	5.100%	5.100%	5.100%
Effective Cost of Preferred	0.000%	0.000%	0.000%	0.000%
Debt Share of Cap Structure	50.000%	50.000%	50.000%	50.000%
Preferred Share of Cap Structure	0.000%	0.000%	0.000%	0.000%
Weighted Cost of Debt	2.550%	2.550%	2.550%	2.550%
Weighted Cost of Debt (monthly)	0.213%	0.213%	0.213%	0.213%
Weighted Cost of Preferred	0.000%	0.000%	0.000%	0.000%
Equity Share of Cap Structure	50.000%	50.000%	50.000%	50.000%
State Tax Rate	7.580%	7.580%	7.580%	7.580%
Federal Tax Rate	21.000%	21.000%	21.000%	21.000%
Composite Tax Rate	26.988%	26.988%	26.988%	26.988%
Bad Debt Rate	0.326%	0.326%	0.326%	0.326%
Franchise Fee Rate	2.538%	2.538%	2.538%	2.538%
Working Cash Factor	3.827%	3.827%	3.827%	3.827%
WACC	7.300%	7.300%	7.300%	7.300%
WACC (monthly)	0.608%	0.608%	0.608%	0.608%
Gross-Up Factor	1.370	1.370	1.370	1.370
ROE Target	9.500%	9.500%	9.500%	9.500%
Grossed-Up COC	9.056%	9.056%	9.056%	9.056%
OPUC Fee Rate	0.321%	0.321%	0.321%	0.321%

Utility Income Taxes

Book Revenues	\$	166	\$	166	\$	166	\$	166
Book Expenses	\$	166	\$	166	\$	166	\$	166
Interest Deduction	\$	0	\$	0	\$	0	\$	0
Production Deduction	\$	-	\$	-	\$	-	\$	-
Permanent Ms	\$	-	\$	-	\$	-	\$	-
Deferred Ms	\$	-	\$	-	\$	-	\$	-
Taxable Income	\$	0	\$	0	\$	0	\$	0
Current State Tax	\$	0	\$	0	\$	0	\$	0
State Tax Credits	\$	-	\$	-	\$	-	\$	-
Net State Taxes	\$	0	\$	0	\$	0	\$	0
Federal Taxable Income	\$	0	\$	0	\$	0	\$	0
Current Federal Tax	\$	0	\$	0	\$	0	\$	0
Federal Tax Credits	\$	-	\$	-	\$	-	\$	-
ITC Amort	\$	-	\$	-	\$	-	\$	-
Deferred Taxes	\$	-	\$	-	\$	-	\$	-
Total Income Tax Expense	\$	0	\$	0	\$	0	\$	0
SB 408 Ratio - Net to Gross		0%		0%		0%		0%

SB 408 Ratio - Effective Tax Rate		19%		19%		19%		19%
Check SB 408 Calc	\$	-	\$	-	\$	-	\$	-
Regulated Net Income								
Check Regulated NI								

Portland General Electric Company
 2021 Incremental Revenue Requirement - Boardman Decommissioning
 Dollars in 000s

	May	June	July	August	September	October
\$	166	\$ 166	\$ 166	\$ 166	\$ 166	\$ 166
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	166	\$ 166	\$ 166	\$ 166	\$ 166	\$ 166
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	1	\$ 1	\$ 1	\$ 1	\$ 1	\$ 1
\$	1	\$ 1	\$ 1	\$ 1	\$ 1	\$ 1
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	1	\$ 1	\$ 1	\$ 1	\$ 1	\$ 1
\$	160	\$ 160	\$ 160	\$ 160	\$ 160	\$ 160
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	4	\$ 4	\$ 4	\$ 4	\$ 4	\$ 4
\$	0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$	166	\$ 166	\$ 166	\$ 166	\$ 166	\$ 166
\$	0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	-	\$ -	\$ -	\$ -	\$ -	\$ -
\$	6	\$ 6	\$ 6	\$ 6	\$ 6	\$ 6

\$	6	\$	6	\$	6	\$	6	\$	6	\$	6
	5.100%		5.100%		5.100%		5.100%		5.100%		5.100%
	0.000%		0.000%		0.000%		0.000%		0.000%		0.000%
	50.000%		50.000%		50.000%		50.000%		50.000%		50.000%
	0.000%		0.000%		0.000%		0.000%		0.000%		0.000%
	2.550%		2.550%		2.550%		2.550%		2.550%		2.550%
	0.213%		0.213%		0.213%		0.213%		0.213%		0.213%
	0.000%		0.000%		0.000%		0.000%		0.000%		0.000%
	50.000%		50.000%		50.000%		50.000%		50.000%		50.000%
	7.580%		7.580%		7.580%		7.580%		7.580%		7.580%
	21.000%		21.000%		21.000%		21.000%		21.000%		21.000%
	26.988%		26.988%		26.988%		26.988%		26.988%		26.988%
	0.326%		0.326%		0.326%		0.326%		0.326%		0.326%
	2.538%		2.538%		2.538%		2.538%		2.538%		2.538%
	3.827%		3.827%		3.827%		3.827%		3.827%		3.827%
	7.300%		7.300%		7.300%		7.300%		7.300%		7.300%
	0.608%		0.608%		0.608%		0.608%		0.608%		0.608%
	1.370		1.370		1.370		1.370		1.370		1.370
	9.500%		9.500%		9.500%		9.500%		9.500%		9.500%
	9.056%		9.056%		9.056%		9.056%		9.056%		9.056%
	0.321%		0.321%		0.321%		0.321%		0.321%		0.321%

\$	166	\$	166	\$	166	\$	166	\$	166	\$	166
\$	166	\$	166	\$	166	\$	166	\$	166	\$	166
\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
\$	-	\$	-	\$	-	\$	-	\$	-	\$	-

\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
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\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
\$	-	\$	-	\$	-	\$	-	\$	-	\$	-

\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
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\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
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\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
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\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
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\$	0	\$	0	\$	0	\$	0	\$	0	\$	0
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	0%		0%		0%		0%		0%		0%
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\$	19%	19%	19%	19%	19%	19%
-	\$	-	\$	-	\$	-

	November	December	Annual Rev Req
\$	166	\$ 166	\$ 1,996
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	166	\$ 166	\$ 1,996
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	1	\$ 1	\$ 7
\$	1	\$ 1	\$ 6
\$	-	\$ -	\$ -
\$	1	\$ 1	\$ 13
\$	160	\$ 160	\$ 1,925
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	4	\$ 4	\$ 51
\$	0	\$ 0	\$ 1
\$	166	\$ 166	\$ 1,990
\$	0	\$ 0	\$ 6
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	-	\$ -	\$ -
\$	6	\$ 6	\$ 76

\$	6	\$	6	\$	76
					7.300%
					9.500%
	5.100%		5.100%		5.100%
	0.000%		0.000%		0.000%
	50.000%		50.000%		50.000%
	0.000%		0.000%		0.000%
	2.550%		2.550%		2.550%
	0.213%		0.213%		0.213%
	0.000%		0.000%		0.000%
	50.000%		50.000%		50.000%
	7.580%		7.580%		7.580%
	21.000%		21.000%		35.000%
	26.988%		26.988%		26.988%
	0.326%		0.326%		0.326%
	2.538%		2.538%		2.538%
	3.827%		3.827%		3.827%
	7.300%		7.300%		7.300%
	0.608%		0.608%		0.608%
	1.370		1.370		1.370
	9.500%		9.500%		9.500%
	9.056%		9.056%		9.056%
	0.321%		0.321%		0.321%

\$	166	\$	166	\$	1,996
\$	166	\$	166	\$	1,989
\$	0	\$	0	\$	2
\$	-	\$	-	\$	-
\$	-	\$	-	\$	-
\$	-	\$	-	\$	-
\$	0	\$	0	\$	5

\$	0	\$	0	\$	0
\$	-	\$	-	\$	-
\$	0	\$	0	\$	0

\$	0	\$	0	\$	5
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\$	0	\$	0	\$	1
\$	-	\$	-	\$	-
\$	-	\$	-	\$	-
\$	-	\$	-	\$	-

\$	0	\$	0	\$	1
	0%		0%		0%

	19%		19%		19%
\$	-	\$	-	\$	0.00
			\$		4
			\$		4