PRELIMINARY REPORT

Dam Safety Assessment of CCW Impoundments

Hunter Power Plant
Castle Dale, Utah

United States Environmental Protection Agency
Washington, DC

December 21, 2012

O'BRIEN & GERE

13498/46122

Dam Safety Assessment of CCW Impoundments

Hunter Power Plant
Castle Dale, Utah

Prepared for:
US Environmental Protection Agency
Washington, DC

ROBERT R. BOWERS, P.E. – VICE PRESIDENT
O'BRIEN & GERE ENGINEERS, INC.

DANIEL E. AGRAMONTE, P.E. – MANAGING ENGINEER
O'BRIEN & GERE ENGINEERS, INC.

TABLE OF CONTENTS

1. Introduction 1
1.1. General 1
1.2. Project Purpose and Scope 1
2. Project/Facility Description 3
2.1. Management Unit Identification 3
2.1.1. Raw Water Pond 3
2.1.2. Snow Lake Raw Water Basin 3
2.1.3. Waste Water Pond #1 3
2.1.4. Waste Water Pond #2 3
2.1.5. Ash Landfill Pond 4
2.2. Hazard Potential Classification 4
2.3. Summary 4
3. Records Review 5
3.1. Engineering Documents 5
3.1.1. Stormwater Inflows 6
3.1.2. Stability Analysis 6
3.1.3. Modifications from Original Construction 6
3.1.4. Instrumentation 6
3.2. Previous Inspections 6
3.3. Operator Interviews 7
4. Visual Inspection 8
4.1. General 8
4.2. Summary of Findings 8
5. Conclusions 10
6. Recommendations 11
6.1. Certification Statement 11

Figures

Figure 1 – Site Location Map
Figure 2 – Facility Layout Plan
Figure 3 – Photograph Location Map

Appendices

Appendix A – Visual Inspection Checklist
Appendix B – Photographic Log

1. INTRODUCTION

1.1. GENERAL

In response to the coal combustion waste (CCW) impoundment failure at the TVA/Kingston coal-fired electric generating station in December of 2008, the U. S. Environmental Protection Agency (USEPA) has initiated a nationwide program of structural integrity and safety assessments of coal combustion residuals impoundments or "management units". A CCW management unit is defined as a surface impoundment or similar diked or bermed management unit or management units designated as landfills that receive liquid-borne material and are used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. Management units also include inactive impoundments that have not been formally closed in compliance with applicable federal or state closure/reclamation regulations.

The USEPA has authorized O'Brien & Gere to provide site specific impoundment assessments at selected facilities. This project is being conducted in accordance with the terms of BPA# EP10W000673, Order EP-B12S-00065, dated July 18, 2012.

1.2. PROJECT PURPOSE AND SCOPE

The purpose of this work is to provide Dam Safety Assessment of CCW management units, including the following:

- Identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures
- Note the extent of deterioration, status of maintenance, and/or need for immediate repair
- Evaluate conformity with current design and construction practices
- Determine the hazard potential classification for units not currently classified by the management unit owner or by state or federal agencies

O'Brien & Gere's scope of services for this project includes performing a site specific dam safety assessment of all CCW management units at the subject facility. The scope includes the following tasks:

- Perform a review of pertinent records (prior inspections, engineering reports, drawings, etc.) made available at the time of the site visit to review previously documented conditions and safety issues and gain an understanding of the original design and modifications of the facility.
- Perform a site visit and visual inspection of each CCW management unit and complete the visual inspection checklist to document conditions observed.
- Perform an evaluation of the adequacy of the outlet works, structural stability, quality and adequacy of the management unit's inspection, maintenance, and operations procedures.
- Identify critical infrastructure within 5 miles down gradient of management units.
- Evaluate the risks and effects of potential overtopping and evaluate effects of flood loading on the management units.
- Immediate notification of conditions requiring emergency or urgent corrective action.
- Identify all environmental permits issued for the management units
- Identify all leaks, spills, or releases of any kind from the management units within the last 5 years.
- Prepare a report summarizing the findings of the assessment, conclusions regarding the safety and structural integrity, recommendations for maintenance and corrective action, and other action items as appropriate.

This report addresses the above issues for the impoundments at the Hunter Power Plant in Castle Dale, Utah. The Hunter Power Plant is owned and operated by PacifiCorp Energy. In the course of this assessment, we obtained information from representatives of PacifiCorp Energy.

2. PROJECT/FACILITY DESCRIPTION

The Hunter Power Plant is located on Utah Route 10, approximately three miles south of Castle Dale, Utah. A Site Location Map is included as Figure 1. The coal-fired power station includes three generating units producing a combined 1,350 MW. Coal combustion waste that is produced during power generation is managed dry or dewatered and disposed in an on-site landfill.

The facility has nine impoundments used for storage of raw, process and waste waters. Flyash is managed dry, collected from baghouses (two units) and an electrostatic precipitator (ESP) on one unit, and placed directly in the facility's ash landfill. The facility also has treatment processes for separating bottom ash from sluice water, enabling the bottom ash to be directly disposed in the onsite landfill and the sluice water reused in the plant.

2.1. MANAGEMENT UNIT IDENTIFICATION

The locations of the facility's impoundments observed and inspected during this safety assessment are identified on Figure 2 – Facility Layout Plan. A description of the location, use and materials impounded in each basin is provided below.

2.1.1. Raw Water Pond

The Raw Water Pond located to the west of the plant, stores raw water used for plant operations and is not involved in CCW management.

2.1.2. Snow Lake Raw Water Basin

Snow Lake Raw Water Holding Basin located to the east of the plant, stores raw water used for plant operations and is not involved in CCW management.

2.1.3. Waste Water Pond #1

Waste Water Pond #1, also known as Evaporation Pond # 1, is located approximately 2,000 feet southeast of the plant. The waste water that flows to the pond from the plant includes boiler blowdown, water treatment regeneration waste, waste water from floor drains, cooling tower blowdown, storm water from plant area drains, excess water from the ash handing, and treated sewage effluent. All of the waste water flows first to the nearby Waste Water Holding Basin, an in-ground concrete tank, where solids are allowed to settle out prior to landfill disposal. The waste water then flows from the Waste Water Holding Basin to the evaporation pond.

When Waste Water/Evaporation Pond #1 and the associated Waste Water Holding Basin were first constructed, a very small amount of ash was carried over from the Waste Water Holding basin during system start-up. This situation was quickly remedied. Other than this initial deposition of a very small amount of ash which is a small part of the delta of solids in the northwest corner of the basin, there has been no deposition of ash into the pond.

2.1.4. Waste Water Pond #2

Waste Water Pond #2, also known as Evaporation Pond # 2, is located approximately 3,000 feet southeast of the plant and used conjunctively with Waste Water Pond #1. The waste water that flows to the pond from the plant includes boiler blowdown, water treatment regeneration waste, waste water from floor drains, cooling tower blowdown, storm water from plant area drains, excess water from the ash handing, and treated sewage effluent. All of the waste water flows first to the nearby Waste Water Holding Basin, an in-ground concrete tank, where solids are allowed to settle out prior to landfill disposal. The waste water then flows from the Waste Water Holding Basin to the evaporation pond (Evaporation Pond #2). Waste Water Pond # 2 is not involved in CCW management.

2.1.5. Ash Landfill Pond

The Ash Landfill Pond is situated on the east side of the Plant's Ash Landfill, located approximately 7,500 feet southeast of the Plant. The Ash Landfill Pond is used to manage stormwater runoff from the Ash Landfill.

2.2. HAZARD POTENTIAL CLASSIFICATION

All five of the impoundments listed above are regulated as dams by the State of Utah Department of Natural Resources, Division of Water Rights – Dam Safety Section. The five impoundments are listed in the state's inventory of dams as "Low Hazard" structures per R655-10 of the Utah Administrative Code.

The definitions for the four hazard potentials (Less than Low, Low, Significant and High) are included in the EPA CCW checklists found in Appendix A. Based on the checklist definitions and as a result of this assessment, the hazard potential rating recommended for the five impoundments is **LOW.** No loss of life is considered probable in the event of failure of any of the embankments forming these impoundments. Outside of the Hunter Plant facilities, the nearest downstream structure is more than 25 miles away.

2.3. SUMMARY

Based on a review of records of materials impounded and the observations and inspections performed during the site impoundment assessment visit to document CCW management processes and procedures, it is concluded that none of the impoundments at the Hunter Plant are used for management of CCW. Interviews conducted by USEPA prior to the site assessment visit identified Waste Water Ponds #1 and #2 as potentially being used for CCW management. These two impoundments were more closely examined as part of this assessment.

3. RECORDS REVIEW

A review of available records related to design, construction, operation and inspection of Waste Water Ponds #1 and #2 was performed as part of this assessment. The documents provided by PacifiCorp Energy are listed below:

Table 3.1 *Summary of Documents Reviewed*

Document	Dates	By	Description
Evaporation Basin Construction Drawings	1976	Stearns-Roger Incorporated	Finished Grading Sections and Structures Details for construction of Waste Water Pond #2
Wastewater Storage Pond Construction Drawings	1982	Brown & Root, Inc.	Finish Grading Plan, Sections and Details for construction of Waste Water Pond #1
Dam Inspection Reports	2003, 2008	Utah Department of Natural Resources	Division of Water Rights – Dam Safety Section inspection reports

3.1. ENGINEERING DOCUMENTS

Review of the design drawings revealed information on the design details of Waste Water Ponds #1 and #2, which is summarized below.

Waste Water Pond #1

- The pond was constructed based on drawings issued for construction in June 1982 and completed in November 1983.
- Pond construction involved a combination of excavation (incising) and earth embankment construction on three sides creating a 32-acre impoundment.
- The Pond's earthen embankments vary in height to a maximum of 29.5 feet and were constructed with a clay core centered in the embankment section and extending vertically downward to the bottom elevation.
- The embankment crest was built to a uniform elevation of 5606.00 feet with a gravel access road on the crest around its entire perimeter.
- The interior embankment slopes are lined with hypalon from the crest to the toe of the inside slope, to form a joint with a PVC liner covering the entire pond bottom.
- An 18-inch AQC pipe penetrates the liner system at the bottom of the pond connecting it to a pump structure for delivering the pond water for offsite irrigation.
- An 18-inch AQC pipe penetrates the liner system at the maximum water surface elevation to serve as a high level emergency outlet.

Waste Water Pond #2

- The pond was constructed based on drawings issued for construction in 1976.
- Pond construction involved a combination of excavation (incising) and earth embankment construction on two sides creating a 23.5-acre impoundment.
- The earthen embankments vary in height from zero to 21 feet.
- The embankment crest was built to a uniform elevation of 5609.00 feet with a gravel access road on the crest and around its entire perimeter.
- A two-foot thick "impervious" clay liner was constructed on the basin side slopes and across the entire floor. The clay liner was covered with earth fill or rip rap on the side slopes.
- An 18-inch reinforced concrete pipe provides a drain from the bottom of the pond and an 18-inch

corrugated steel pipe through the embankment provides a high level outlet.
- A pump system is positioned on the crest of the embankment with its intake on the side slope to pump pond water off site for irrigation.

3.1.1. Stormwater Inflows

Stormwater inflows to both Waste Water Ponds #1 and #2 are limited to direct rainfall on the impounded areas. Surface runoff from surrounding areas is directed away from the ponds.

3.1.2. Stability Analysis

None was provided.

3.1.3. Modifications from Original Construction

None.

3.1.4. Instrumentation

Waste Water Pond #1 has piezometers to monitor embankment water levels on the inside and outside of the embankment's clay core. PacifiCorp provided piezometer readings from February 10, 2009. With the exception of one inside location and one different outside location, none of the piezometers had water in them.

3.2. PREVIOUS INSPECTIONS

State of Utah Department of Natural Resources, Division of Water Rights – Dam Safety Section personnel have performed periodic, routine dam safety inspections of five of the Hunter Power Plant impoundments:

- Hunter Snow Lake – UT00359 (Raw Water Holding Basin)
- Hunter Ash Landfill – UT00362 (Ash Landfill Pond)
- Hunter Evaporation Pond – UT00542 (Waste Water Pond #2)
- Hunter Irrigation Pond – UT00543 (Waste Water Pond #1)
- Hunter Raw Water – UT00777 (Raw Water Basin)

PacifiCorp provided records from the state inspection completed in 2003 and the most recent state inspection, performed on September 16, 2008. A copy of the 2004 and 2009inspections were provided with the other documentation. Common deficiencies cited in the state inspection reports included removal of woody vegetation on embankments, and keeping outlet works operating and pipes and channels clear. Additional deficiencies specific to Waste Water Ponds #1 and #2 include the following:

<u>Waste Water Pond #1</u>

1. Repair broken piezometers and continue to collect and forward data (to UTDNR) – 2003 inspection
2. Repair major erosion channel on northeast corner of the dam structure – 2008 inspection
3. Repair hole in spillway pipe section at the toe of dam – 2008 inspection

<u>Waste Water Pond #2</u>

1. Repair leak in inlet/outlet pipe to pumps – 2003 inspection
2. Repair small leak in inlet outlet pipe – 2008 inspection

These items were observed during a site visit on September 13, 2012 to have been addressed by PacifiCorp.

3.3. OPERATOR INTERVIEWS

Numerous plant and corporate personnel took part in the inspection proceedings. The following is a list of participants for the inspection of the Reid/HMPL Ash Pond and the Green Ash Pond:

Table 4 *List of Participants*

Name	Affiliation	Title
Laren Huntsman	PacifiCorp Energy	Managing Director
Larry Bruno	PacifiCorp Energy	Engineering Manager
Travis Larsen	PacifiCorp Energy	Environmental Engineer
Tyson Ekker	PacifiCorp Energy	Environmental Engineer
Jeff Tucker	PacifiCorp Energy	Cooperate Engineer
Les Thompson	PacifiCorp Energy	Safety Administrator
Scott Mower	PacifiCorp Energy	Environmental Analyst
Jay Howard	PacifiCorp Energy	Environmental Analyst
Brad Giles	PacifiCorp Energy	Plant Supervisor
Gary Emmanuel, P.E.	O'Brien & Gere	Project Manager
Daniel Agramonte, P.E.	O'Brien & Gere	Managing Engineer

Facility personnel provided a good working knowledge of the facility's CCW management, provided general plant operation background and provided requested historical documentation. These personnel also accompanied O'Brien & Gere staff throughout the visual inspections to answer questions and to provide additional information as needed in the field.

4. VISUAL INSPECTION

The following sections summarize the inspection of the Hunter Power Plant impoundments, which occurred on September 13, 2012. At the time of the inspection, O'Brien & Gere completed EPA inspection checklists for Waste Water Ponds #1 and #2, which were submitted electronically to EPA on September 28, 2012. Copies of the completed inspection checklists are included as Appendix A.

4.1. GENERAL

The weather on the date of the inspection was clear and approximately 70 degrees. The visual inspection consisted of a driving and walking tour of the facility to observe the various identified impoundments and process equipment for managing CCW, along with a thorough site walk along the raised dikes of Waste Water Ponds #1 and #2. O'Brien & Gere team members made observations along the toe, outboard slope, and crest of the embankments of Waste Water Ponds #1 and #2, and along their exposed inboard slopes, including the exposed outlet works.

Photos of relevant features and conditions observed during the inspection were taken by O'Brien & Gere and are provided in Appendix B. An aerial View of Waste Water Ponds #1 and #2 is presented as Figure 3 which provides photograph locations and directions.

4.2. SUMMARY OF FINDINGS

O'Brien & Gere observed the Hunter Power Plant's mechanical process equipment used in managing CCW for disposal in the onsite landfill, including hoppers for loading flyash and bottom ash onto trucks, and the hydrobin and associated tankage, piping, etc. used in separating bottom ash from sluice water so that bottom ash can be directly landfilled and the sluice water re-used in the Plant's operations.

Waste Water Pond #1

Waste Water Pond #1 was observed to be nearly empty, its stored water having been pumped throughout the summer for irrigation of nearby farm fields. A very shallow pool of water covered approximately 80% of the Pond's bottom. Settled solids were observed to form a delta-like deposit near the inlet pipe outfall in the Pond which raised that portion above the shallow, impounded water.

The Pond's hypalon-lined inner side slopes were exposed and appeared to be fully intact, including connections with the overflow discharge piping. O'Brien & Gere did not walk on the exposed liner system to inspect the inlet piping connection and outlet connection to irrigation pumping since these are at the bottom of the lined slope.

The Pond's design and construction does not include provisions for CCW management such as equipment access that would be needed for removal of CCW or weirs for decanting water.

Waste Water Pond #2

Waste Water Pond #2 was observed to be nearly empty, its stored water having been pumped throughout the summer for irrigation of nearby farm fields. A very shallow pool of water covered approximately 20% of the Pond's bottom. Settled solids were observed to form a delta-like deposit near the inlet pipe outfall in the Pond which raised that portion above the shallow, impounded water.

The Pond's clay lining is protected by earth fill or rip rap on its side slopes and is unprotected on its floor, except for accumulated solids (non-ash) that have settled. Sparse grasses and shrub/scrub vegetation had taken hold on the exposed portions of the bottom and in the rip rap protection of the side slopes.

The Pond's design and construction does not include provisions for CCW management, such as equipment access that would be needed for removal of CCW or weirs for decanting water.

5. CONCLUSIONS

Based on the interviews with PacifiCorp Energy plant and corporate personnel, review of available design documents and observation or inspection of plant impoundments and CCW management processes, O'Brien & Gere concludes the following: (1) CCW materials at the Hunter Power Plant are not being managed in surface impoundments or similar diked or bermed management units or management units designated as landfills that receive liquid-borne material and are used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals; and (2) the facility has no inactive impoundments storing CCW materials that would be subject to the formal closure requirements set forth in applicable federal or state closure/reclamation regulations.

6. RECOMMENDATIONS

Based on the findings of our visual inspection and review of the available records for the Waste Water Ponds #1 and #2 and observation of the other active impoundments a the Hunter Power Plant, O'Brien & Gere has no recommendations related to CCW management at the facility.

6.1. CERTIFICATION STATEMENT

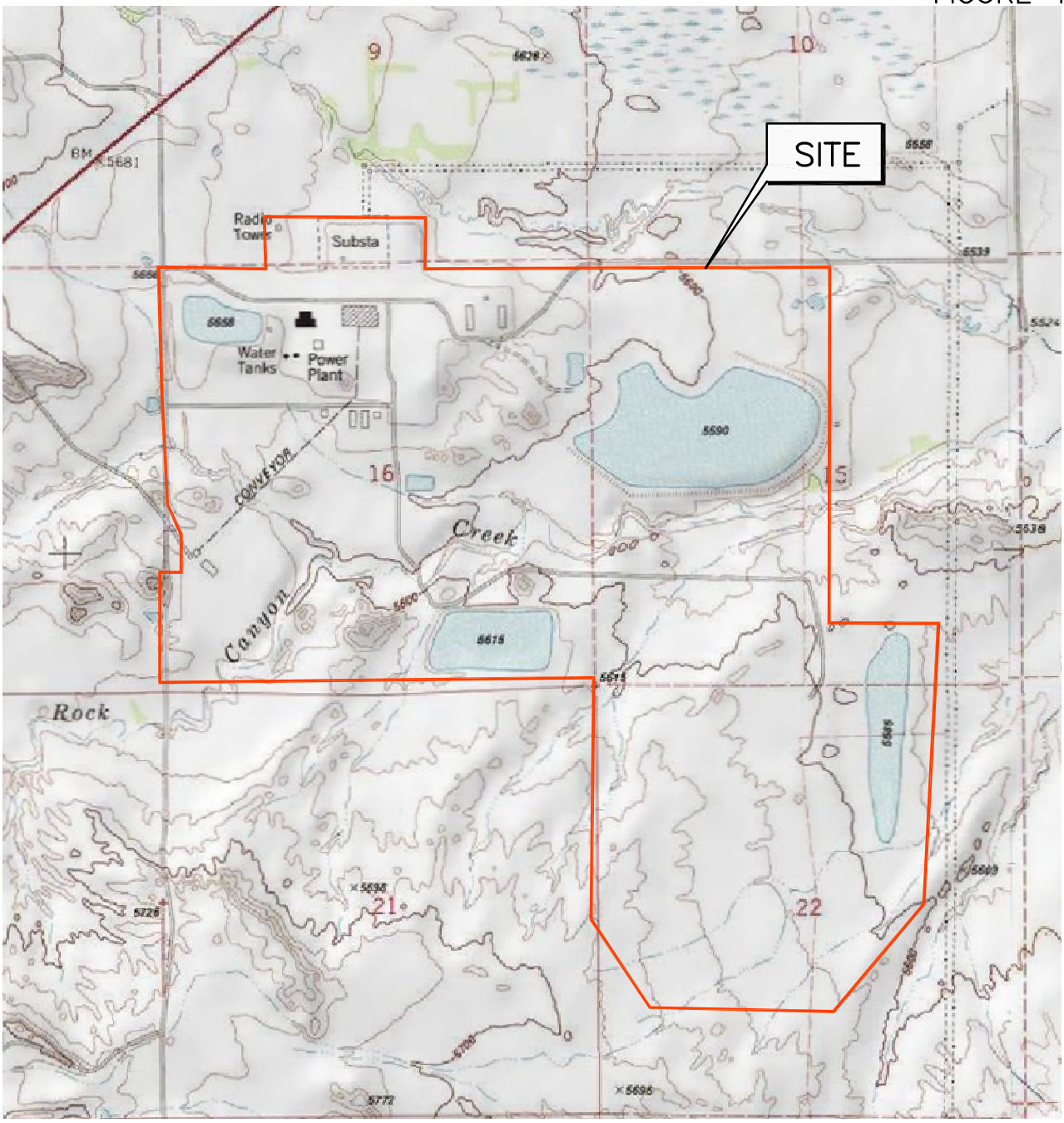
I acknowledge that the Hunter Power Plant impoundments referenced herein were personally observed or inspected by me on September 13, 2012 and none were found to be CCW management units.

Signature: _____ Date: _____

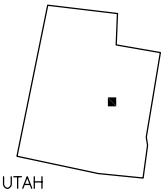
Daniel Agramonte, PE
UT PE # 7573727-2202

Figures

FIGURE 1



ADAPTED FROM: CASTLE DALE, UT U.S.G.S. 7.5 MIN. QUADRANGLE



QUADRANGLE LOCATION

US EPA – DAM SAFETY ASSESSMENT OF CCW IMPOUNDMENTS
PACIFICORP ENERGY – HUNTER POWER PLANT

SITE LOCATION MAP

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 5 1 KILOMETER

FILE NO. 13498.46122-260

DECEMBER 2012

SCALE: 1:24000

O'BRIEN & GERE

FIGURE 2

US EPA
DAM SAFETY ASSESSMENT
OF CCW IMPOUNDMENTS

PACIFICORP ENERGY
HUNTER POWER PLANT

FACILITY LAYOUT PLAN

1"=2000' 2000 0 2000

FILE NO. 13498.46122.-260
DECEMBER 2012

O'BRIEN & GERE

FIGURE 3

1 PHOTOGRAPH NUMBER AND ORIENTATION

US EPA
DAM SAFETY ASSESSMENT
OF CCW IMPOUNDMENTS

PACIFICORP ENERGY
HUNTER POWER PLANT

PHOTOGRAPH LOCATION MAP

1"=300' 300 0 300

FILE NO. 13498.46122.-260
DECEMBER 2012

O'BRIEN & GERE

Appendix A

Visual Inspection Checklists

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Hunter Power Plant	Date:	September 13, 2012
Unit Name:	Waste Water Pond #1	Operator's Name:	PacifiCorp Energy
Unit I.D.:		Hazard Potential Classification:	High Significant Low ✓
Inspector's Name:	Daniel Agramonte, P.E., Gary Emmanuel, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Monthly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	5,576.0		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	0.0		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	5,600.0		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	5,605.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?		✓
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)		✓	At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # None

INSPECTOR Daniel Agramonte, P.E.
Gary Emmanuel, P.E.

Date September 13, 2012

Impoundment Name Hunter Power Plant - Waste Water Pond #1
Impoundment Company PacifiCorp Energy
EPA Region 8
State Agency (Field Office) Addresss Utah Dept. of Natural Resources, Div. of Water Rights
1594 West North Temple, Suite 220
Salt Lake City, UT 84114-6300
Name of Impoundment Waste Water Pond #1
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Storage of plant wastewaters prior to re-use for offsite agricultural irrigation.

Nearest Downstream Town : Name Page, Arizona
Distance from the impoundment Approximately 150 miles
Impoundment Location: Longitude 111 Degrees 01 Minutes 24 Seconds
Latitude 39 Degrees 10 Minutes 04 Seconds
State Utah County Emery

Does a state agency regulate this impoundment? YES X NO _____

If So Which State Agency? Utah Department of Natural Resources, Division of Water Rights

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

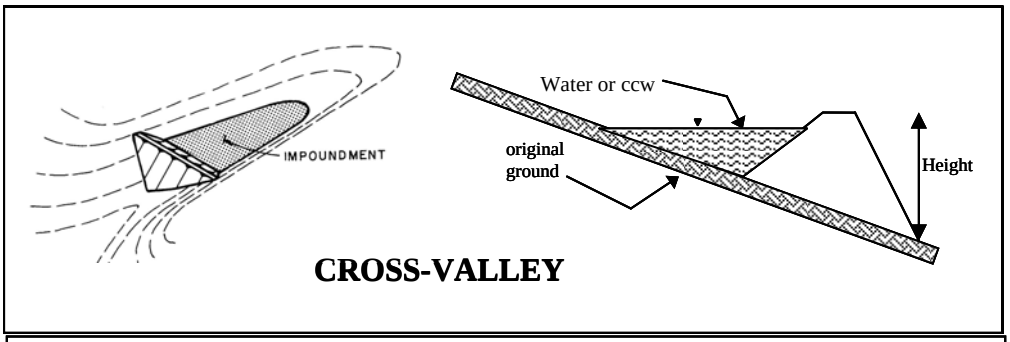
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

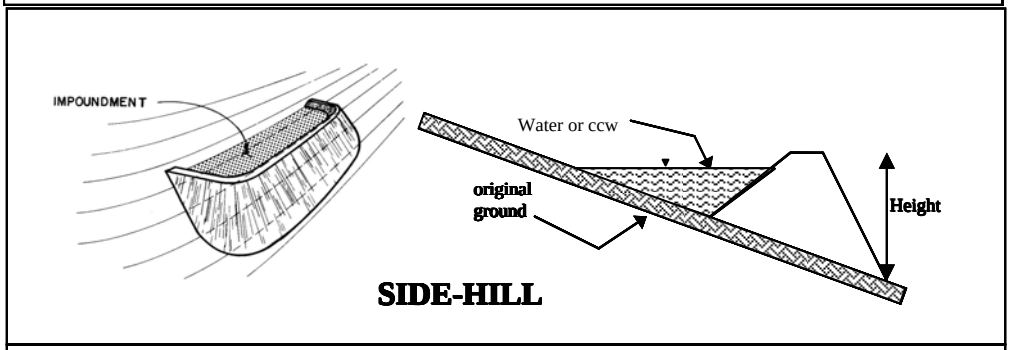
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

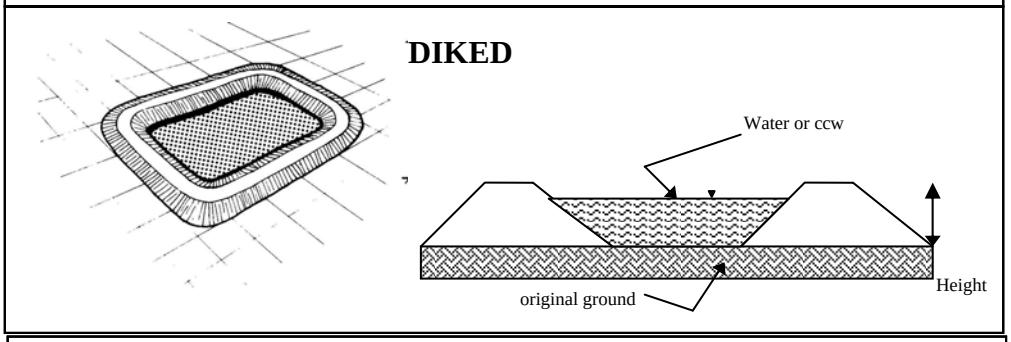
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

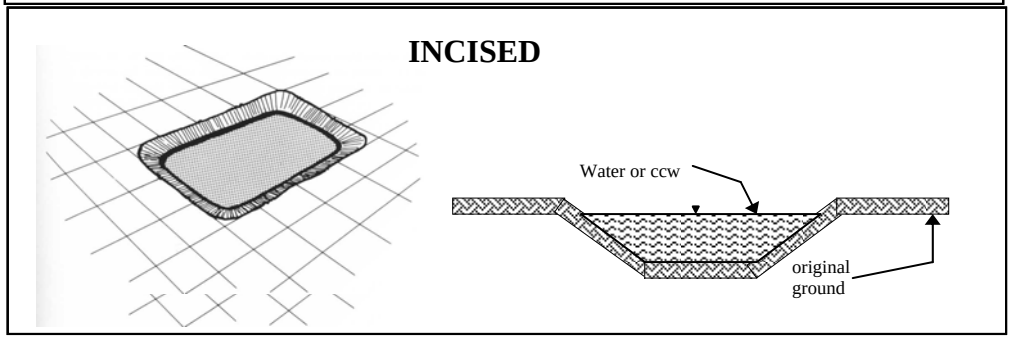
The nearest downstream town is approximately 150 miles downstream. The first structure of any kind is a bridge more than 25 miles downstream. There is a negligible amount of CCR in the pond, if any.

CONFIGURATION:









_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
__X__ Combination Incised/Diked

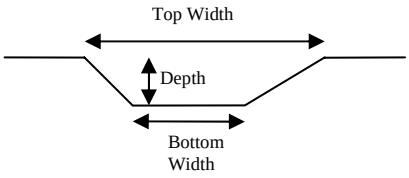
Embankment Height 29.5 feet
Embankment Material Earth
Pool Area 32. acres
Liner Combination of Hypalon and PVC
Current Freeboard 29. feet
Liner Permeability < 1 x 10^{-9} cm/sec

Elevation and freeboard heights taken and estimated from 1983 design drawings and field observations.

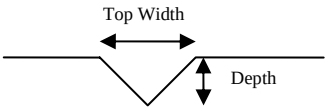
TYPE OF OUTLET (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

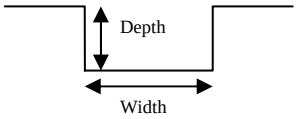


TRIANGULAR

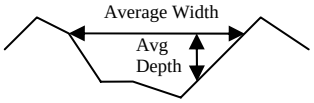


_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR

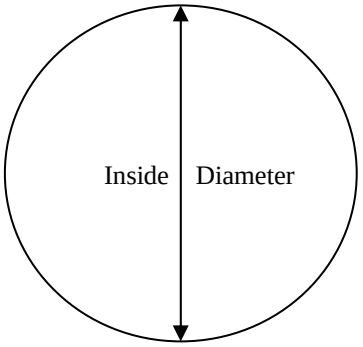


IRREGULAR



__X__ **Outlet**

16-in. inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
__X__ other (specify) AQC

Is water flowing through the outlet? YES _____ NO X (pond empty)

_____ **No Outlet**

__X__ **Other Type of Outlet** (specify) 16-in. AQC overflow pipe

The Impoundment was Designed By Brown & Root, Inc. (1983)

Has there ever been a failure at this site? YES _____ NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __x____

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___x____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Hunter Power Plant	Date:	September 13, 2012
Unit Name:	Waste Water Pond #2	Operator's Name:	PacifiCorp Energy
Unit I.D.:		Hazard Potential Classification:	High Significant Low ✓
Inspector's Name:	Daniel Agramonte, P.E., Gary Emmanuel, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Monthly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	5,595.0		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	0.0		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	5,606.5		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	5,609.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?		✓
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)		✓	At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # None

INSPECTOR Daniel Agramonte, P.E.
Gary Emmanuel, P.E.

Date September 13, 2012

Impoundment Name Hunter Power Plant - Waste Water Pond #2
Impoundment Company PacifiCorp Energy
EPA Region 8
State Agency (Field Office) Addresss Utah Dept. of Natural Resources, Div. of Water Rights
1594 West North Temple, Suite 220
Salt Lake City, UT 84114-6300
Name of Impoundment Waste Water Pond #2
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Storage of plant wastewaters prior to re-use for offsite agricultural irrigation.

Nearest Downstream Town : Name Page, Arizona
Distance from the impoundment Approximately 150 miles
Impoundment Location: Longitude 111 Degrees 01 Minutes 25 Seconds
Latitude 39 Degrees 09 Minutes 50 Seconds
State Utah County Emery

Does a state agency regulate this impoundment? YES X NO _____

If So Which State Agency? Utah Department of Natural Resources, Division of Water Rights

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

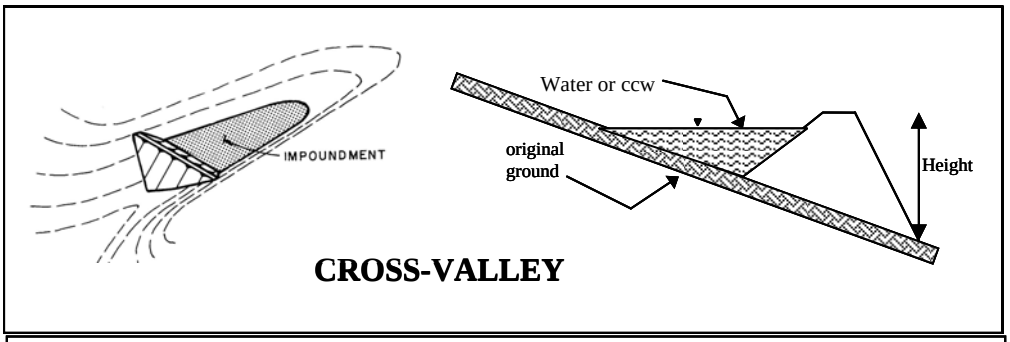
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

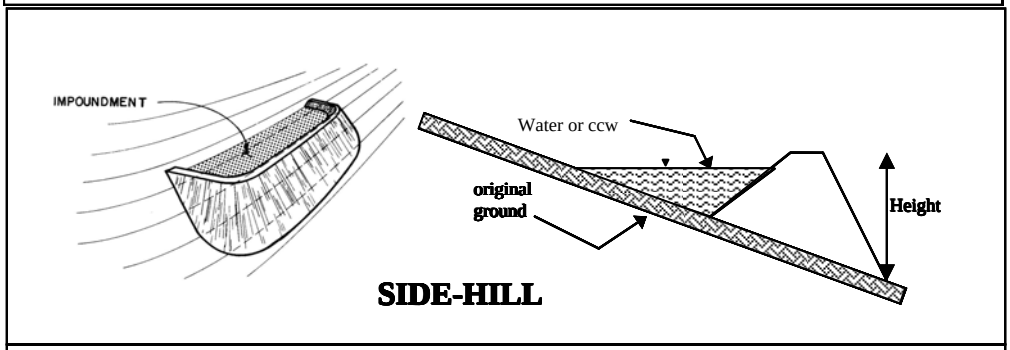
_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

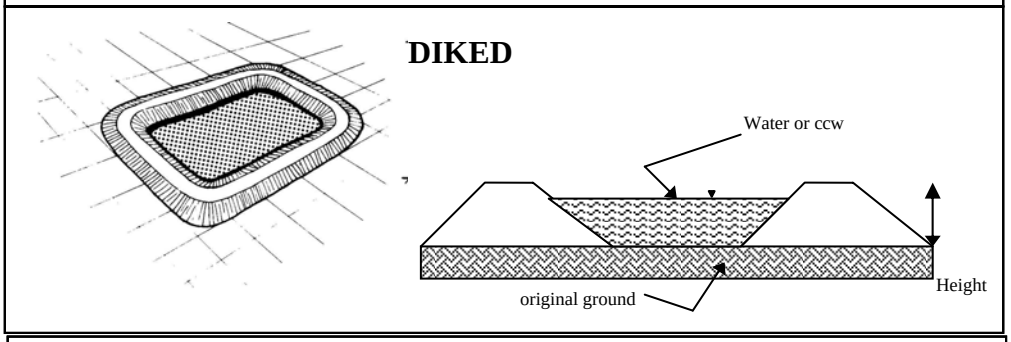
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

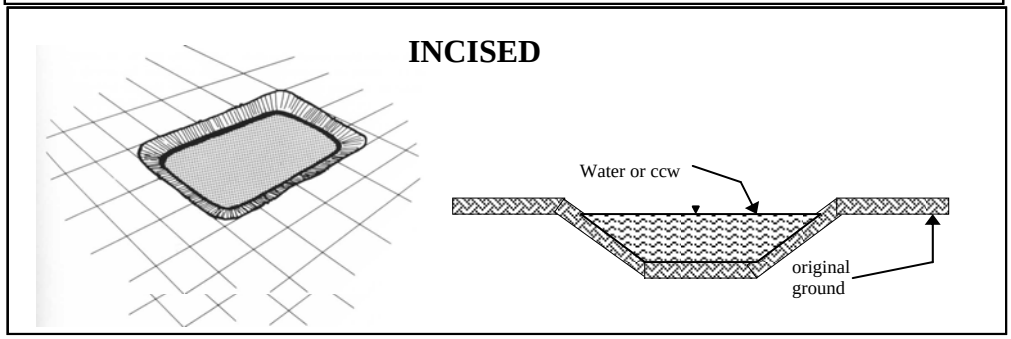
The nearest downstream structure of any kind is a bridge located more than 25 miles downstream. There is negligible, if any, CCR stored in the pond.

CONFIGURATION:









_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
__X__ Combination Incised/Diked

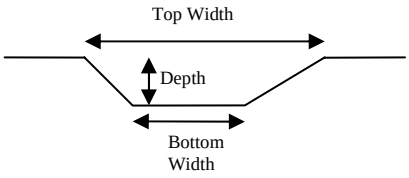
Embankment Height 21. feet Embankment Material Earth
Pool Area 23.5 acres Liner Clay
Current Freeboard 20. feet Liner Permeability < 1 x 10^{-7} cm/sec (design)

Embankment height taken from design drawings. Freeboard height estimated based on design and field observations.

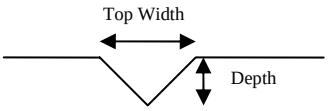
TYPE OF OUTLET (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

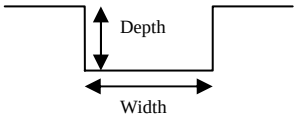


TRIANGULAR

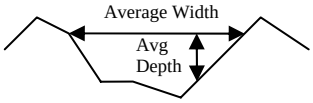


_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR

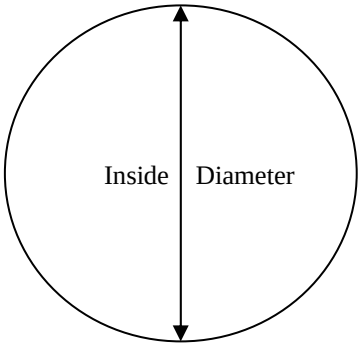


IRREGULAR



__X__ **Outlet**

18-in. inside diameter



Material
_____ corrugated metal
_____ welded steel
__X__ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES _____ NO __X (pond empty)__

_____ **No Outlet**

__X__ **Other Type of Outlet** (specify) 18-in.CSP overflow pipe

The Impoundment was Designed By Brown & Root, Inc. (1976)

Has there ever been a failure at this site? YES _____ NO ___x_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __x____

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ___x____

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Appendix B

Photographic Log

O'BRIEN & GERE

PHOTOGRAPHIC LOG

Client: US EPA	Project Number: 46122.260
Site Name: PacifiCorp Hunter Power Plant	Location: Castle Dale, Utah

Orientation:

Description:
View of northwest corner of Wastewater Pond #1. Some solids have accompanied the wastewater that enters the pond in this corner. Pond slopes are lined with hypalon. Per the drawings, the pond bottom is lined with PVC.

Date:
13 Sept. 2012

Photo Number:
1

Photographer:
G. Emmanuel

Orientation:

Description:
View of Wastewater Pond #1 from the southeast corner looking northwest. The pond is nearly empty. It's stored water is pumped to nearby fields for irrigation.

Date:
13 Sept. 2012

Photo Number:
2

Photographer:
G. Emmanuel

O'BRIEN & GERE

PHOTOGRAPHIC LOG

Client: US EPA	Project Number: 46122.260
Site Name: PacifiCorp Hunter Power Plant	Location: Castle Dale, Utah

Orientation:

Description:
View looking across the interior of Wastewater Pond #2. The pond has a 2-ft. thick clay liner on the bottom and slopes. The slopes are protected by a layer of rip rap. Volunteer vegetation has taken hold while the pond is nearly empty.

Date:
13 Sept. 2012

Photo Number:
3

Photographer:
G. Emmanuel

Orientation:

Description:
View of the north side slope of Wastewater Pond #2 looking east from its northwest corner. Some volunteer vegetation has taken hold in the rip rap protection.

Date:
13 Sept. 2012

Photo Number:
4

Photographer:
G. Emmanuel

O'BRIEN & GERE

PHOTOGRAPHIC LOG

Client: US EPA	Project Number: 46122.260
Site Name: PacifiCorp Hunter Power Plant	Location: Castle Dale, Utah

Orientation:	
Description: View of the west side slope of Wastewater Pond #2 from the northwest corner.	
Date: 13 Sept. 2012	
Photo Number: 5	
Photographer: G. Emmanuel	
Orientation:	
Description: Typical flyash loading hopper. Fly ash is handled dry at the Hunter Plant and delivered via truck to the Plant's ash landfill.	
Date: 13 Sept. 2012	
Photo Number: 6	
Photographer: G. Emmanuel	

O'BRIEN & GERE

PHOTOGRAPHIC LOG

Client: US EPA	Project Number: 46122.260
Site Name: PacifiCorp Hunter Power Plant	Location: Castle Dale, Utah

Orientation:

Description:
This hydrobin is used to separate sluice water from bottom ash at Unit 3. The

Date:
13 Sept. 2012

Photo Number:
7

Photographer:
G. Emmanuel

Orientation:

Description:
Bottom ash dewatered in the hydrobin is directly loaded into truck from this hopper to be taken to the onsite ash landfill for disposal.

Date:
13 Sept. 2012

Photo Number:
8

Photographer:
G. Emmanuel