SW136

CK# 9323, $1,000

DSHW-2016-012841

APPLICATION FOR A PERMIT TO OPERATE A COAL COMBUSTION RESIDUAL LANDFILL AND COAL COMBUSTION RESIDUAL SURFACE IMPOUNDMENTS AT INTERMOUNTAIN GENERATING FACILITY

Intermountain Power Service Company
850 West Brush Wellman Road
Delta Utah 84624

Application for a Permit to Operate a Coal Combustion Residual Landfill and Coal Combustion Residual Surface Impoundments at Intermountain Generating Facility

FACILITY NAME:	Intermountain Generating Facility
SOLID WASTE FACILITY TYPE:	Existing coal combustion residual (CCR) landfill and existing CCR surface impoundments
SITE LOCATION:	Facilities are located 11 miles North of Delta, Utah in Sections 11, 14, and 23 of Township 15 South, Range 7 West, Salt Lake Base and Meridian, Millard County, Utah.
APPLICANT NAME:	Intermountain Power Service Corporation (IPSC)
APPLICANT ADDRESS:	850 West Brush Wellman Road Delta, Utah 84624
APPLICANT CONTACT:	Mike Utley, IPSC Environmental Engineer
APPLICANT PHONE:	(435) 864-6489
OWNER NAME:	Intermountain Power Agency (IPA)
OWNER ADDRESS:	10653 South River Front Parkway, Suite 120 South Jordan, Utah 84095
OPERATOR NAME:	Intermountain Power Service Corporation
OPERATOR ADDRESS:	850 West Brush Wellman Road Delta, Utah 84624
OPERATOR CONTACT:	Jon Finlinson, President and Chief Operations Officer
OPERATOR PHONE:	(435) 864-4414

Pursuant to Rule R315-319-1, Intermountain Power Service Corporation is submitting this application for a solid waste facility permit for the existing CCR landfill (Intermountain Power Combustion By-products Landfill) and existing CCR surface impoundments (Intermountain Power Bottom Ash Basin (UT00463) and Intermountain Power Waste Water Basin (UT00468)) located at the Intermountain Generating Facility (IGF). A map showing the locations of the CCR Units is attached as Appendix A.

An archaeological survey was prepared in August 2009 for the portion of the CCR landfill that was not developed at that time and is attached to this application as Appendix B. Because the Intermountain Power CCR Units are existing CCR Units and IPSC is not currently seeking expansion of any of the units, it is not possible to conduct any additional historical and archeological identification efforts at this time.

Subsection R315-319-1 requires that all landfills disposing of CCRs and surface impoundments containing CCRs have a permit for a Class I, II, or V landfill in accordance with Rules R315-302 through 307 or a CCR permit issued under Rule R315-319. IPSC is applying for a CCR permit under Rule R315-319. The Intermountain Power Combustion By-products Landfill is a landfill disposing of CCRs and the Intermountain Power Bottom Ash Basin (UT00463) and the Intermountain Power Waste Water Basin (UT00468) are surface impoundments containing CCRs. IPSC is applying for a permit to continue to dispose of CCRs and co-dispose of the solid wastes listed in R315-261-4(b)(4) in each of the three CCR Units.

Rule R315-319 requires that an application for a permit for a CCR unit contain the information required in Sections R315-319-60 through 107. No information need be submitted for which the effective date in Sections R315-319-60 through 107 has not been reached at the time of application submittal. All information required in Sections R315-319-60 through 107 with an effective date that falls later that the application submittal shall be submitted within six months of the effective date of the requirement found in Sections R315-319-60 through 107. The information required by R315-319-60 through 107 with an effective date earlier than the date of this application is contained in this application. All information required in Sections R315-319-60 through 107 with an effective date that falls after the date of this application will be submitted within six months of the effective date of the requirement found in Sections R315-319-60 through 107. This application follows the application procedures of Sections R315-310-1 and 2 and the notification requirements of Subsection R315-310-3(2).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Jon A Finlinson (signature)   Date: 9/7/16

Jon A. Finlinson
President and Chief Operations Officer

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1 INTERMOUNTAIN POWER COMBUSTION BY-PRODUCTS LANDFILL

The Intermountain Generating Facility has one existing CCR landfill named the Intermountain Power Combustion By-Products Landfill. This section will address the permit application requirements in R315-319 as they apply to the Intermountain Power Combustion By-Products Landfill.

1.1 PLACEMENT ABOVE THE UPPERMOST AQUIFER

Section R315-319-60 requires new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units to be constructed with a base that is located no less than 1.52 meters, five feet, above the upper limit of the uppermost aquifer, or to demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations, including the seasonal high water table.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills and IPSC is not currently applying for a lateral expansion of its CCR landfill, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill at this time.

1.2 WETLANDS

Section R315-319-61 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in wetlands, as defined in Section R315-301-2, unless the owner or operator demonstrates by the dates specified in Rule R315-319-61(c) that the CCR unit meets the requirements of Subsections R315-319-61(a)(1) through (5).

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills and IPSC is not currently applying for a lateral expansion of its CCR landfill, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill at this time.

1.3 FAULT AREAS

Section R315-319-62 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located within 60 meters, 200 feet, of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in Subsection R315-319-62(c) that an alternative setback distance of less than 60 meters, 200 feet, will prevent damage to the structural integrity of the CCR unit.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills and IPSC is not currently applying for a lateral expansion of its CCR landfill, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill at this time.

1.4 SEISMIC IMPACT ZONES

Section R315-319-63 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in Subsection R315-319-63(c) that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills and IPSC is not currently applying for a lateral expansion of its CCR landfill, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill at this time.

1.5 UNSTABLE AREAS

Section R315-319-64 requires that an existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit not be located in an unstable area unless the owner or operator demonstrates by the dates specified in Subsection R315-319-64(d) that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. For an existing CCR landfill, the owner or operator shall complete the demonstration required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-64 has not been reached at the time of application submittal, no information need be submitted under this section at this time.

1.6 DESIGN CRITERIA FOR NEW CCR LANDFILLS AND ANY LATERAL EXPANSION

Section R315-319-70 requires new CCR landfills and any lateral expansion of a CCR landfill to be designed, constructed, operated, and maintained with either a composite liner that meets the requirements of Subsection R315-319-70(b) or an alternative composite liner that meets the requirements in Subsection R315-319-70(c), and a leachate collection and removal system that meets the requirements of Subsection R315-319-70(d).

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. Because IPSC is not applying for a permit for a new CCR landfill or a lateral expansion of a CCR landfill, no information need be submitted at this time under this section.

1.7 LINER DESIGN CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

Section R315-319-71 requires that no later than October 17, 2016, the owner or operator of an existing CCR surface impoundment document whether or not such unit was constructed with any one of the following:

(i) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1 x 10-7 cm/sec;

(ii) A composite liner that meets the requirements of Subsection R315-319-70(b); or

(iii) An alternative composite liner that meets the requirements of Subsection R315-319-70(c).

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.8 LINER DESIGN CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

Section R315-319-72 requires new CCR surface impoundments and lateral expansions of existing and new CCR surface impoundments to be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Subsection R315-319-70(b) or (c).

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.9 STRUCTURAL INTEGRITY CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. Section R315-319-73 does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.10 STRUCTURAL INTEGRITY CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

The requirements of Section R315-319-74 apply to all new CCR surface impoundments and any lateral expansion of a CCR surface impoundment.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. Because IPSC is not applying for a permit for a new CCR surface impoundment or a lateral expansion of CCR surface impoundment, no information need be submitted under this section at this time.

1.11 OPERATING CRITERIA – AIR CRITERIA

Section R315-319-80 requires the owner or operator of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit to adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

1.11.1 CCR Fugitive Dust Control Plan

The owner or operator of the CCR unit shall prepare and operate in accordance with a CCR fugitive dust control plan that has been submitted to and has received approval from the Director. The owner or operator of a CCR unit shall prepare an initial CCR fugitive dust control plan for the facility no later than October 19, 2015.

IPSC prepared and operates in accordance with a CCR fugitive dust control plan signed October 14, 2015. IPSC's CCR fugitive dust control plan has been placed in IPSC's operating record and uploaded to IPSC's CCR Web site. IPSC provided notice to the Director of the availability of the plan. A copy of the notice letter and CCR fugitive dust control plan are attached as Appendix C.

1.11.2 Annual CCR Fugitive Dust Control Report

The owner or operator of a CCR unit shall prepare an annual CCR fugitive dust control report that includes a description of the actions taken by the owner or operator to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken. The initial annual report shall be completed no later than 14 months after placing the initial CCR fugitive dust control plan in the facility's operating record.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

1.12 OPERATING CRITERIA - RUN-ON AND RUN-OFF CONTROLS FOR CCR LANDFILLS

Section R315-319-81 requires the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill to design, construct, operate, and maintain: (1) A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm; and (2) A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm. The owner or operator of the CCR unit shall prepare the initial run-on and run-off control system plan no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted under this section at this time.

1.13 OPERATING CRITERIA - HYDROLOGIC AND HYDRAULIC CAPACITY REQUIREMENTS

Section R315-319-82 requires the owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment to design, construct, operate, and maintain an inflow design flood control system. The owner or operator of the CCR unit shall prepare the initial inflow design flood control system plan no later than October 17, 2016.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.14 OPERATING CRITERIA – CCR SURFACE IMPOUNDMENT INSPECTION

Section R315-319-83 requires inspections by a qualified person of all CCR surface impoundments. The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.15 OPERATING CRITERIA – CCR LANDFILL INSPECTION REQUIREMENTS

Section R315-319-84 requires inspections by a qualified person of all CCR surface landfills.

1.15.1 Seven Day Inspections

At intervals not exceeding seven days, inspect for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. The owner or operator of the CCR unit shall initiate the inspections required no later than October 19, 2015.

IPSC conducts inspections at intervals not exceeding seven days. A copy of the Seven Day Inspection Form is attached as Appendix D.

1.15.2 Annual Inspections

The CCR unit shall additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The qualified professional engineer shall prepare a report following each inspection. The owner or operator of the CCR unit shall complete the initial inspection required by no later than January 18, 2016.

The initial inspection report was completed by a qualified professional engineer as specified. IPSC provided notice to the Director of the availability of the report. The Initial Annual Inspection Report, dated January 18, 2016, and the notice letter are attached as Appendix E.

1.16 GROUNDWATER MONITORING AND CORRECTIVE ACTION

Section R315-319-90 requires that no later than October 17, 2017, the owner or operator of the CCR unit to be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by Subsection R315-319-91;

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by Subsection R315-319-93;

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by Subsection R315-319-94(b); and

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of Rule R315-319 as required by Subsection R315-319-94.

Section R315-319-90 requires that once a groundwater monitoring system and groundwater monitoring program has been established, the owner or operator shall conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator shall prepare an annual groundwater monitoring and corrective action report and forward the report to the Director by March 1 of each year.

Section R315-319-91 requires the owner or operator of a CCR unit to install a groundwater monitoring system consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer. The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information. The groundwater monitoring system shall include the minimum number of monitoring wells necessary to meet the performance standards specified in Subsection R315-319-91(a), based on the site-specific information specified in Subsection R315- 319-91(b).

The owner or operator shall obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of Section R315-319-91. If the groundwater monitoring system includes the minimum number of monitoring wells specified in Subsection R315-319-91(c)(1), the certification shall document the basis supporting this determination.

Section R315-319-93 requires the owner or operator of the CCR unit to develop and receive approval from the Director for a sampling and analysis program.

Section R315-319-94 requires the owner or operator of a CCR unit to conduct detection monitoring at all groundwater monitoring wells consistent with Section R315-319-94. A minimum of eight independent samples from each background and downgradient well shall be collected and analyzed for the constituents listed in appendix III and IV to Rule R315-319 no later than October 17, 2017.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under these sections. However, IPSC has installed a groundwater monitoring system and developed a groundwater sampling and analysis program. The Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report is attached as Appendix F and Ground Water Sampling and Analysis Plan is attached as Appendix G.

1.17 ASSESSMENT MONITORING PROGRAM

Section R315-319-95 requires assessment monitoring whenever a statistically significant increase over background levels has been detected for one or more of the constituents listed in appendix III to Rule R315-319.

Because IPSC has not detected a statistically significant increase over background levels for one or more of the constituents listed in appendix III to Rule R315-319, no information need be submitted at this time under this section.

1.18 ASSESSMENT OF CORRECTIVE MEASURES

Section R315-319-96 requires that within 90 days of finding that any constituent listed in appendix IV to Rule R315-319 has been detected at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or immediately upon detection of a release from a CCR unit, the owner or operator shall initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions.

Because IPSC has not detected any constituent listed in appendix IV to Rule R315-319 at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or detected a release from a CCR unit, no information need be submitted at this time under this section.

1.19 SELECTION OF REMEDY

Section R315-319-97 requires that, based on the results of the corrective measures assessment conducted under Subsection R315-319-96, the owner or operator, as soon as feasible, select a remedy that, at a minimum, meets the standards listed in Subsection R315-319-97(b). The owner or operator shall prepare a semiannual report describing the progress in selecting and designing the remedy. Upon selection of a remedy, the owner or operator shall prepare a final report describing the selected remedy and how it meets the standards specified in Subsection R315-319-97(b). The remedy and report shall be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer that the remedy selected meets the requirements of Section R315-319-97. The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h)(12).

Because IPSC has not conducted the corrective measures assessment under Subsection R315-319-96, no information need be submitted at this time under this section.

1.20 IMPLEMENTATION OF THE CORRECTIVE ACTION PROGRAM

Section R315-319-98 requires that, within 90 days of selecting a remedy under Subsection R315-319-97, the owner or operator shall initiate remedial activities. If an owner or operator of the CCR unit determines, at any time, that compliance with the requirements of Subsection R315-319-97(b) is not being achieved through the remedy selected, the owner or operator shall, with approval of the Director, implement other methods or techniques that could feasibly achieve compliance with the requirements. Upon completion of the remedy, the owner or operator shall prepare a notification stating that the remedy has been completed. The notification shall be submitted to and be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer attesting that the remedy has been completed in compliance with the requirements of Subsection R315-319-98(c). The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h) (13).

Because IPSC is not required to select a remedy under Subsection R315-319-97 at this time, no information need be submitted at this time under this section.

1.21 CLOSURE AND POST-CLOSURE CARE – INACTIVE CCR SURFACE IMPOUNDMENTS

Section R315-319-100 states that inactive CCR surface impoundments are subject to all of the requirements of Sections R315-319-50 through 107 applicable to existing CCR surface impoundments. Because IPSC does not have an inactive CCR surface impoundment at this time, no information need be submitted at this time under this section.

1.22 CLOSURE AND POST-CLOSURE CARE - CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-101 requires that the owner or operator of an existing unlined CCR surface impoundment, as determined under Subsection R315-319- 71(a), except as provided by Subsection R315-319-101(a)(3), if at any time after October 19, 2015, determines in any sampling event that the concentrations of one or more constituents listed in appendix IV to Rule R315-319 are detected at statistically significant levels above the groundwater protection standard established under Subsection R315-319-95(h) for such CCR unit, within six months of making such determination, cease placing CCR and non-CCR wastestreams into such CCR surface impoundment and either retrofit or close the CCR unit in accordance with the requirements of Subsection R315-319-102.

The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. This Section does not apply to existing CCR landfills, so no information need be submitted under this section for the Intermountain Power Combustion By-Products Landfill.

1.23 CRITERIA FOR CONDUCTING THE CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-102 requires the owner or operator of a CCR unit to prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

1.24 CLOSURE AND POST-CLOSURE CARE – ALTERNATIVE CLOSURE REQUIREMENTS

Section R315-319-103 states alternative closure requirements. Because IPSC's CCR Units are not subject to closure at the time of the application submittal, no information need be submitted at this time under this section.

1.25 CLOSURE AND POST-CLOSURE CARE – POST-CLOSURE CARE REQUIREMENTS

Section R315-319-104 requires the owner or operator of a CCR unit to prepare a written post-closure plan and any amendments to the plan. The Intermountain Power Combustion By-Products Landfill is an existing CCR landfill. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

1.26 RECORDKEEPING REQUIREMENTS

Section R315-319-105 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain files of all information required by Section R315-319-105 in a written operating record at their facility. IPSC maintains a written operating record at their facility.

1.27 NOTIFICATION REQUIREMENTS

Section R315-319-106 requires that the notifications required under Subsections R315-319-106(e) through (i) be sent to the Director before the close of business on the day the notification is required to be completed. For purposes of Section R315-319-106, before the close of business means the notification shall be postmarked or sent by electronic mail (email). If a notification deadline falls on a weekend or federal holiday, the notification deadline is automatically extended to the next business day.

IPSC notified the Director of the availability of the CCR fugitive dust control plan (see Appendix C), the groundwater monitoring system certification (see Appendix F), and periodic inspection reports (see Appendix E) and will continue to provide notification as required under Section R315-319-106.

1.28 PUBLICALLY ACCESSIBLE INTERNET SITE REQUIREMENTS

Section R315-319-107 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain a publicly accessible Internet site, CCR Web site, containing the information specified in Section R315-319-107. The owner or operator's Web site shall be titled "CCR Rule Compliance Data and Information." IPSC maintains a publicly accessible internet site titled CCR Rule Compliance Data and Information at http://ipscenvironmental.weebly.com accessible from IPSC's internet site http://ipsc.com.

1.29 NOTIFICATION TO NEIGHBORING PROPERTY OWNERS

Subsection R315-310-3(2) requires a permit application to provide the name and address of all owners of property within 1,000 feet of the proposed solid waste facility and documentation that a notice of intent to apply for a permit for a solid waste facility has been sent to all property owners identified. The Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration manage public property within 1,000 feet of the Intermountain Generating Facility's CCR landfill.

Notices of intent to apply for a permit for a solid waste facility have been sent to the Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration (see Appendix H). The name and address of all owners of property within 1,000 feet of the Intermountain Generating Facility's CCR landfill are:

Director David Ure
State of Utah School and Institutional Trust Land Administration
675 East 500 South, Suite 500
Salt Lake City, UT 84102

Field Office Manager Michael Gates
Bureau of Land Management Fillmore Field Office
95 East 500 North
Fillmore, UT 84631

Lands in the immediate vicinity of the Intermountain Generating Facility are publicly owned desert range lands. These lands are designated Multiple Use and used primarily for livestock grazing and limited wildlife management. The ground surface of these lands is relatively flat, covered with native vegetation such as sagebrush, greasewood and rabbit brush. The nearest cultivated lands are located more than two miles southwest of the plant site in the Sugarville and Sutherland areas.

1.30 LOCAL GOVERNMENT

Subsection R315-310-3(2) also requires a permit application to provide the Director with the name of the local government with jurisdiction over the site and the mailing address of that local government office.

Millard County has jurisdiction over the site. Permission to operate IGF was obtained by IPA in the Conditional Use Permit granted by the Millard County Commission on January 5, 1981.

Millard County Delta Office
71 South 200 West
PO Box 854
Delta, Utah 84624

Millard County Fillmore Offices
50 South Main
Fillmore, Utah 84631

2 INTERMOUNTAIN POWER BOTTOM ASH BASIN (UT00463)

The Intermountain Generating Facility has two existing CCR surface impoundments named the Intermountain Power Bottom Ash Basin (UT00463) and the Intermountain Power Waste Water Basin (UT00468). This section will address the permit application requirements in R315-319 as they apply to the Intermountain Power Bottom Ash Basin (UT00463).

2.1 PLACEMENT ABOVE THE UPPERMOST AQUIFER

Section R315-319-60 requires new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units to be constructed with a base that is located no less than 1.52 meters, five feet, above the upper limit of the uppermost aquifer, or to demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations, including the seasonal high water table.

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstration required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-60 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.2 WETLANDS

Section R315-319-61 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in wetlands, as defined in Section R315-301-2, unless the owner or operator demonstrates by the dates specified in Rule R315-319-61(c) that the CCR unit meets the requirements of Subsections R315-319-61(a)(1) through (5).

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-61 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.3 FAULT AREAS

Section R315-319-62 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located within 60 meters, 200 feet, of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in Subsection R315-319-62(c) that an alternative setback distance of less than 60 meters, 200 feet, will prevent damage to the structural integrity of the CCR unit.

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-62 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.4 SEISMIC IMPACT ZONES

Section R315-319-63 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in Subsection R315-319-63(c) that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstration required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-63 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.5 UNSTABLE AREAS

Section R315-319-64 requires that an existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit not be located in an unstable area unless the owner or operator demonstrates by the dates specified in Subsection R315-319-64(d) that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstration required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-64 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.6 DESIGN CRITERIA FOR NEW CCR LANDFILLS AND ANY LATERAL EXPANSION

Section R315-319-70 requires new CCR landfills and any lateral expansion of a CCR landfill to be designed, constructed, operated, and maintained with either a composite liner that meets the requirements of Subsection R315-319-70(b) or an alternative composite liner that meets the requirements in Subsection R315-319-70(c), and a leachate collection and removal system that meets the requirements of Subsection R315-319-70(d).

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. This Section does not apply to existing CCR surface impoundments, so no information need be submitted under this section for the Intermountain Power Bottom Ash Basin (UT00463).

2.7 LINER DESIGN CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-71 requires that no later than October 17, 2016, the owner or operator of an existing CCR surface impoundment document whether or not such unit was constructed with any one of the following:

- (i) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1 x 10-7 cm/sec;
- (ii) A composite liner that meets the requirements of Subsection R315-319-70(b); or
- (iii) An alternative composite liner that meets the requirements of Subsection R315-319-70(c).

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.8 LINER DESIGN CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

Section R315-319-72 requires new CCR surface impoundments and lateral expansions of existing and new CCR surface impoundments to be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Subsection R315-319-70(b) or (c).

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Because IPSC is not applying for a permit for a new CCR surface impoundment or a lateral expansion of an existing or new CCR surface impoundment, no information need be submitted at this time under this section.

2.9 STRUCTURAL INTEGRITY CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-73 applies to existing CCR surface impoundments. Section R315-319-73 requires that:

2.9.1 Permanent Identification Markers

No later than, December 17, 2015, the owner or operator of the CCR unit to place on or immediately adjacent to the CCR unit a permanent identification marker, at least six feet high showing the identification number of the CCR unit, if one has been assigned by the state, the name associated with the CCR unit.

IPSC has placed permanent identification markers meeting the requirements of Section R315-319-73 on each CCR unit at IGF. Photos of the markers are attached as Appendix I.

2.9.2 Periodic hazard potential classification assessments.

The owner or operator of the CCR unit to conduct initial and periodic hazard potential classification assessments of the CCR unit. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.9.3 Emergency Action Plan (EAP)

No later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment under Subsection R315-319-73(a)(2) to prepare and maintain a written EAP.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.9.4 Slope Protection

The CCR unit and surrounding areas be designed, constructed, operated, and maintained with vegetated slopes of dikes except for slopes which are protected with an alternate form(s) of slope protection.

The Intermountain Power Bottom Ash Basin (UT00463) is designed, constructed, operated, and maintained with vegetated slopes of dikes.

2.9.5 History of Construction

No later than October 17, 2016, the owner or operator of the CCR unit to compile and submit to the Director a history of construction.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.9.6 Periodic Structural Stability Assessments

The owner or operator of the CCR unit to conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.9.7 Periodic Safety Factor Assessments

The owner or operator to conduct and submit to the Director an initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in Subsections R315-319-73(e)(1)(i) through (iv) for the critical cross section of the embankment. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.10 STRUCTURAL INTEGRITY CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

The requirements of Section R315-319-74 apply to all new CCR surface impoundments and any lateral expansion of a CCR surface impoundment.

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Because IPSC is not applying for a permit for a new CCR surface impoundment or the lateral expansion of a CCR surface impoundment, no information need be submitted at this time under this section.

2.11 OPERATING CRITERIA – AIR CRITERIA

Section R315-319-80 requires the owner or operator of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit to adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

2.11.1 CCR Fugitive Dust Control Plan

The owner or operator of the CCR unit shall prepare and operate in accordance with a CCR fugitive dust control plan that has been submitted to and has received approval from the Director. The owner or operator of a CCR unit shall prepare an initial CCR fugitive dust control plan for the facility no later than October 19, 2015.

IPSC prepared and operates in accordance with a CCR fugitive dust control plan signed October 14, 2015. IPSC's CCR fugitive dust control plan has been placed in IPSC's operating record and uploaded to IPSC's CCR Web site. IPSC provided notice to the Director of the availability of the plan. A copy of the notice letter and CCR fugitive dust control plan are attached as Appendix C.

2.11.2 Annual CCR Fugitive Dust Control Report

The owner or operator of a CCR unit shall prepare an annual CCR fugitive dust control report that includes a description of the actions taken by the owner or operator to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken. The initial annual report shall be completed no later than 14 months after placing the initial CCR fugitive dust control plan in the facility's operating record.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

2.12 OPERATING CRITERIA - RUN-ON AND RUN-OFF CONTROLS FOR CCR LANDFILLS

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-81 does not apply to existing CCR surface impoundments, so no information need be submitted under this section for the Intermountain Power Bottom Ash Basin (UT00463).

2.13 OPERATING CRITERIA - HYDROLOGIC AND HYDRAULIC CAPACITY REQUIREMENTS

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-82 requires the owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment to design, construct, operate, and maintain an inflow design flood control system. The owner or operator of the CCR unit shall prepare the initial inflow design flood control system plan no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.14 OPERATING CRITERIA – CCR SURFACE IMPOUNDMENT INSPECTION

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-83 requires inspections by a qualified person of all CCR surface impoundments.

2.14.1 Seven Day Inspections

At intervals not exceeding seven days, inspect for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the surface impoundment or through the dike of the CCR unit for abnormal discoloration, flow or discharge of debris or sediment. The owner or operator of the CCR unit shall initiate the inspections required no later than October 19, 2015.

IPSC conducts inspections at intervals not exceeding seven days. A copy of the Seven Day Inspection Form is attached as Appendix D.

2.14.2 30 Day Inspections

At intervals not exceeding 30 days, monitor all CCR unit instrumentation. The owner or operator of the CCR unit shall initiate the inspections required no later than October 19, 2015.

IPSC conducts inspections at intervals not exceeding 30 days. A copy of the 30 Day Inspection Form is attached as Appendix J.

2.14.3 Annual Inspections

The CCR unit shall additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The qualified professional engineer shall prepare a report following each inspection. The owner or operator of the CCR unit shall complete the initial inspection required by no later than January 18, 2016.

The initial inspection report was completed by a qualified professional engineer as specified. IPSC provided notice to the Director of the availability of the report. The Initial Annual Inspection Report dated, January 18, 2016, and the notice letter are attached as Appendix E.

2.15 OPERATING CRITERIA – CCR LANDFILL INSPECTION REQUIREMENTS

The Intermountain Power Bottom Ash Basin (UT00463) is an existing CCR surface impoundment. Section R315-319-84 does not apply to existing CCR surface impounds, so no information need be submitted under this section for the Intermountain Power Bottom Ash Basin (UT00463).

2.16 GROUNDWATER MONITORING AND CORRECTIVE ACTION

Section R315-319-90 requires that no later than October 17, 2017, the owner or operator of the CCR unit to be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by Subsection R315-319-91;

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by Subsection R315-319-93;

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by Subsection R315-319-94(b); and

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of Rule R315-319 as required by Subsection R315-319-94.

Section R315-319-90 requires that once a groundwater monitoring system and groundwater monitoring program has been established, the owner or operator shall conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator shall prepare an annual groundwater monitoring and corrective action report and forward the report to the Director by March 1 of each year.

Section R315-319-91 requires the owner or operator of a CCR unit to install a groundwater monitoring system consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer. The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information. The groundwater monitoring system shall include the minimum number of monitoring wells necessary to meet the performance standards specified in Subsection R315-319-91(a), based on the site-specific information specified in Subsection R315- 319-91(b).

The owner or operator shall obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of Section R315-319-91. If the groundwater monitoring system includes the minimum number of monitoring wells specified in Subsection R315-319-91(c)(1), the certification shall document the basis supporting this determination.

Section R315-319-93 requires the owner or operator of the CCR unit to develop and receive approval from the Director for a sampling and analysis program.

Section R315-319-94 requires the owner or operator of a CCR unit to conduct detection monitoring at all groundwater monitoring wells consistent with Section R315-319-94. A minimum of eight independent samples from each background and downgradient well shall be collected and analyzed for the constituents listed in appendix III and IV to Rule R315-319 no later than October 17, 2017.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under these sections. However, IPSC has installed a groundwater monitoring system and developed a groundwater sampling and analysis program. The Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report is attached as Appendix F and Ground Water Sampling and Analysis Plan is attached as Appendix G.

2.17 ASSESSMENT MONITORING PROGRAM

Section R315-319-95 requires assessment monitoring whenever a statistically significant increase over background levels has been detected for one or more of the constituents listed in appendix III to Rule R315-319.

Because IPSC has not detected a statistically significant increase over background levels for one or more of the constituents listed in appendix III to Rule R315-319, no information need be submitted at this time under this section.

2.18 ASSESSMENT OF CORRECTIVE MEASURES

Section R315-319-96 requires that within 90 days of finding that any constituent listed in appendix IV to Rule R315-319 has been detected at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or immediately upon detection of a release from a CCR unit, the owner or operator shall initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions.

Because IPSC has not detected any constituent listed in appendix IV to Rule R315-319 at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or detected a release from a CCR unit, no information need be submitted at this time under this section.

2.19 SELECTION OF REMEDY

Section R315-319-97 requires that, based on the results of the corrective measures assessment conducted under Subsection R315-319-96, the owner or operator, as soon as feasible, select a remedy that, at a minimum, meets the standards listed in Subsection R315-319-97(b). The owner or operator shall prepare a semiannual report describing the progress in selecting and designing the remedy. Upon selection of a remedy, the owner or operator shall prepare a final report describing the selected remedy and how it meets the standards specified in Subsection R315-319-97(b). The remedy and report shall be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer that the remedy selected meets the requirements of Section R315-319-97. The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h)(12).

Because IPSC has not conducted the corrective measures assessment under Subsection R315-319-96, no information need be submitted at this time under this section.

2.20 IMPLEMENTATION OF THE CORRECTIVE ACTION PROGRAM

Section R315-319-98 requires that, within 90 days of selecting a remedy under Subsection R315-319-97, the owner or operator shall initiate remedial activities. If an owner or operator of the CCR unit determines, at any time, that compliance with the requirements of Subsection R315-319-97(b) is not being achieved through the remedy selected, the owner or operator shall, with approval of the Director, implement other methods or techniques that could feasibly achieve compliance with the requirements. Upon completion of the remedy, the owner or operator shall prepare a notification stating that the remedy has been completed. The notification shall be submitted to and be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer attesting that the remedy has been completed in compliance with the requirements of Subsection R315-319-98(c). The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h) (13).

Because IPSC is not required to select a remedy under Subsection R315-319-97 at this time, no information need be submitted at this time under this section.

2.21 CLOSURE AND POST-CLOSURE CARE – INACTIVE CCR SURFACE IMPOUNDMENTS

Section R315-319-100 states that inactive CCR surface impoundments are subject to all of the requirements of Sections R315-319-50 through 107 applicable to existing CCR surface impoundments. Because IPSC does not have an inactive CCR surface impoundment at this time, no information need be submitted at this time under this section.

2.22 CLOSURE AND POST-CLOSURE CARE - CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-101 requires that the owner or operator of an existing unlined CCR surface impoundment, as determined under Subsection R315-319- 71(a), except as provided by Subsection R315-319-101(a)(3), if at any time after October 19, 2015 determines in any sampling event that the concentrations of one or more constituents listed in appendix IV to Rule R315-319 are detected at statistically significant levels above the groundwater protection standard established under Subsection R315-319-95(h) for such CCR unit, within six months of making such determination, cease placing CCR and non-CCR wastestreams into such CCR surface impoundment and either retrofit or close the CCR unit in accordance with the requirements of Subsection R315-319-102.

Because IPSC has not completed, and is not required to have completed before the application submittal date, the detection monitoring necessary to establish groundwater protection standards for the constituents in appendix IV to Rule R315-319, no information need be submitted at this time under this section.

2.23 CRITERIA FOR CONDUCTING THE CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-102 requires the owner or operator of a CCR unit to prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.24 CLOSURE AND POST-CLOSURE CARE – ALTERNATIVE CLOSURE REQUIREMENTS

Section R315-319-103 states alternative closure requirements. Because IPSC's CCR Units are not subject to closure at the time of the application submittal, no information need be submitted at this time under this section.

2.25 CLOSURE AND POST-CLOSURE CARE – POST-CLOSURE CARE REQUIREMENTS

Section R315-319-104 requires the owner or operator of a CCR unit to prepare a written post-closure plan and any amendments to the plan. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

2.26 RECORDKEEPING REQUIREMENTS

Section R315-319-105 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain files of all information required by Section R315-319-105 in a written operating record at their facility. IPSC maintains a written operating record at their facility.

2.27 NOTIFICATION REQUIREMENTS

Section R315-319-106 requires that the notifications required under Subsections R315-319-106(e) through (i) shall be sent to the Director before the close of business on the day the notification is required to be completed. For purposes of Section R315-319-106, before the close of business means the notification shall be postmarked or sent by electronic mail (email). If a *notification deadline falls on a weekend or federal holiday, the notification* deadline is automatically extended to the next business day.

IPSC notified the Director of the availability of the CCR fugitive dust control plan (see Appendix C), the groundwater monitoring system certification (see Appendix F), and periodic inspection reports (see Appendix E) and will continue to provide notification as required under Section R315-319-106.

2.28 PUBLICALLY ACCESSIBLE INTERNET SITE REQUIREMENTS

Section R315-319-107 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain a publicly accessible Internet site, CCR Web site, containing the information specified in Section R315-319-107. The owner or operator's Web site shall be titled "CCR Rule Compliance Data and Information." IPSC maintains a publicly accessible internet site titled CCR Rule Compliance Data and Information at http://ipscenvironmental.weebly.com accessible from IPSC's internet site http://ipsc.com.

2.29 NOTIFICATION TO NEIGHBORING PROPERTY OWNERS

Subsection R315-310-3(2) requires a permit application to provide the name and address of all owners of property within 1,000 feet of the proposed solid waste facility and documentation that a notice of intent to apply for a permit for a solid waste facility has been sent to all property owners identified. The Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration manage public property within 1,000 feet of the

Intermountain Generating Facility's CCR landfill. IPSC is the owner of all the property within 1,000 feet of the Intermountain Power Bottom Ash Basin (UT00463).

Notices of intent to apply for a permit for a solid waste facility have been sent to the Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration (see Appendix H). The name and address of all owners of property within 1,000 feet of the Intermountain Generating Facility's CCR landfill are:

Director David Ure
State of Utah School and Institutional Trust Land Administration
675 East 500 South, Suite 500
Salt Lake City, UT 84102

Field Office Manager Michael Gates
Bureau of Land Management Fillmore Field Office
95 East 500 North
Fillmore, UT 84631

Lands in the immediate vicinity of the Intermountain Generating Facility are publicly owned desert range lands. These lands are designated Multiple Use and used primarily for livestock grazing and limited wildlife management. The ground surface of these lands is relatively flat, covered with native vegetation such as sagebrush, greasewood and rabbit brush. The nearest cultivated lands are located more than two miles southwest of the plant site in the Sugarville and Sutherland areas.

2.30 LOCAL GOVERNMENT

Subsection R315-310-3(2) also requires a permit application to provide the Director with the name of the local government with jurisdiction over the site and the mailing address of that local government office.

Millard County has jurisdiction over the site. Permission to operate IGF was obtained by IPA in the Conditional Use Permit granted by the Millard County Commission on January 5, 1981.

Millard County Delta Office
71 South 200 West
PO Box 854
Delta, Utah 84624

Millard County Fillmore Offices
50 South Main
Fillmore, Utah 84631

3 INTERMOUNTAIN POWER WASTE WATER BASIN (UT00468)

The Intermountain Generating Facility has two existing CCR surface impoundments named the Intermountain Power Bottom Ash Basin (UT00463) and the Intermountain Power Waste Water Basin (UT00468). This section will address the permit application requirements in R315-319 as they apply to the Intermountain Power Waste Water Basin (UT00468).

3.1 PLACEMENT ABOVE THE UPPERMOST AQUIFER

Section R315-319-60 requires new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units to be constructed with a base that is located no less than 1.52 meters, five feet, above the upper limit of the uppermost aquifer, or to demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations, including the seasonal high water table.

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstration required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-60 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.2 WETLANDS

Section R315-319-61 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in wetlands, as defined in Section R315-301-2, unless the owner or operator demonstrates by the dates specified in Rule R315-319-61(c) that the CCR unit meets the requirements of Subsections R315-319-61(a)(1) through (5).

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-61 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.3 FAULT AREAS

Section R315-319-62 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located within 60 meters, 200 feet, of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in Subsection R315-319-62(c) that an alternative setback distance of less than 60 meters, 200 feet, will prevent damage to the structural integrity of the CCR unit.

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-62 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.4 SEISMIC IMPACT ZONES

Section R315-319-63 requires that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in Subsection R315-319-63(c) that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-63 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.5 UNSTABLE AREAS

Section R315-319-64 requires that an existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit not be located in an unstable area unless the owner or operator demonstrates by the dates specified in Subsection R315-319-64(d) that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. For an existing CCR surface impoundment, the owner or operator shall complete the demonstrations required by this section not later than October 17, 2018. Because the applicable effective date in Section R315-319-64 has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.6 DESIGN CRITERIA FOR NEW CCR LANDFILLS AND ANY LATERAL EXPANSION

Section R315-319-70 requires new CCR landfills and any lateral expansion of a CCR landfill to be designed, constructed, operated, and maintained with either a composite liner that meets the requirements of Subsection R315-319-70(b) or an alternative composite liner that meets the requirements in Subsection R315-319-70(c), and a leachate collection and removal system that meets the requirements of Subsection R315-319-70(d).

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. This Section does not apply to existing CCR surface impoundments, so no information need be submitted under this section for the Intermountain Power Bottom Ash Basin (UT00463).

3.7 LINER DESIGN CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

Section R315-319-71 requires that no later than October 17, 2016, the owner or operator of an existing CCR surface impoundment document whether or not such unit was constructed with any one of the following:

(i) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1 x 10-7 cm/sec;

(ii) A composite liner that meets the requirements of Subsection R315-319-70(b); or

(iii) An alternative composite liner that meets the requirements of Subsection R315-319-70(c).

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.8 LINER DESIGN CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

Section R315-319-72 requires new CCR surface impoundments and lateral expansions of existing and new CCR surface impoundments to be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Subsection R315-319-70(b) or (c).

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Because IPSC is not applying for a permit for a new CCR surface impoundment or a lateral expansion of an existing or new CCR surface impoundment, no information need be submitted at this time under this section.

3.9 STRUCTURAL INTEGRITY CRITERIA FOR EXISTING CCR SURFACE IMPOUNDMENTS

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Section R315-319-73 applies to existing CCR surface impoundments. Section R315-319-73 requires that:

3.9.1 Permanent Identification Markers

No later than, December 17, 2015, the owner or operator of the CCR unit to place on or immediately adjacent to the CCR unit a permanent identification marker, at least six feet high showing the identification number of the CCR unit, if one has been assigned by the state, the name associated with the CCR unit.

IPSC has placed permanent identification markers meeting the requirements of Section R315-319-73 on each CCR unit at IGF. Photos of the markers are attached as Appendix I.

3.9.2 Periodic hazard potential classification assessments.

The owner or operator of the CCR unit to conduct initial and periodic hazard potential classification assessments of the CCR unit. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.9.3 Emergency Action Plan (EAP)

No later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment under Subsection R315-319-73(a)(2) to prepare and maintain a written EAP.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.9.4 Slope Protection

The CCR unit and surrounding areas to be designed, constructed, operated, and maintained with vegetated slopes of dikes except for slopes which are protected with an alternate form(s) of slope protection.

Intermountain Power Waste Water Basin (UT00468) is designed, constructed, operated, and maintained with vegetated slopes of dikes.

3.9.5 History of Construction

No later than October 17, 2016, the owner or operator of the CCR unit to compile and submit to the Director a history of construction.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.9.6 Periodic Structural Stability Assessments

The owner or operator of the CCR unit to conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.9.7 Periodic Safety Factor Assessments

The owner or operator to conduct and submit to the Director an initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in Subsections R315-319-73(e)(1)(i) through (iv) for the critical cross section of the embankment. The owner or operator of the CCR unit shall complete the initial assessment no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.10 STRUCTURAL INTEGRITY CRITERIA FOR NEW CCR SURFACE IMPOUNDMENTS

The requirements of Section R315-319-74 apply to all new CCR surface impoundments and any lateral expansion of a CCR surface impoundment.

Because IPSC is not applying for a permit for a new CCR surface impoundment or a lateral expansion CCR surface impoundment, no information need be submitted at this time under this section.

3.11 OPERATING CRITERIA – AIR CRITERIA

Section R315-319-80 requires the owner or operator of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit to adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

3.11.1 CCR Fugitive Dust Control Plan

The owner or operator of the CCR unit shall prepare and operate in accordance with a CCR fugitive dust control plan that has been submitted to and has received approval from the Director. The owner or operator of a

CCR unit shall prepare an initial CCR fugitive dust control plan for the facility no later than October 19, 2015.

IPSC prepared and operates in accordance with a CCR fugitive dust control plan signed October 14, 2015. IPSC's CCR fugitive dust control plan has been placed in IPSC's operating record and uploaded to IPSC's CCR Web site. IPSC provided notice to the Director of the availability of the plan. A copy of the notice letter and CCR fugitive dust control plan are attached as Appendix C.

3.11.2 Annual CCR Fugitive Dust Control Report

The owner or operator of a CCR unit shall prepare an annual CCR fugitive dust control report that includes a description of the actions taken by the owner or operator to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken. The initial annual report shall be completed no later than 14 months after placing the initial CCR fugitive dust control plan in the facility's operating record.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this subsection.

3.12 OPERATING CRITERIA - RUN-ON AND RUN-OFF CONTROLS FOR CCR LANDFILLS

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Section R315-319-81 does not apply to existing CCR surface impoundments, so no information need be submitted under this section for the Intermountain Power Waste Water Basin (UT00468).

3.13 OPERATING CRITERIA - HYDROLOGIC AND HYDRAULIC CAPACITY REQUIREMENTS

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Section R315-319-82 requires the owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment to design, construct, operate, and maintain an inflow design flood control system. The owner or operator of the CCR unit shall prepare the initial inflow design flood control system plan no later than October 17, 2016.

Because the applicable effective date has not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.14 OPERATING CRITERIA – CCR SURFACE IMPOUNDMENT INSPECTION

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Section R315-319-83 requires inspections by a qualified person of all CCR surface impoundments.

3.14.1 Seven Day Inspections

At intervals not exceeding seven days, inspect for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the surface impoundment or through the dike of the CCR unit for abnormal discoloration, flow or discharge of debris or sediment. The owner or operator of the CCR unit shall initiate the inspections required no later than October 19, 2015.

IPSC conducts inspections at intervals not exceeding seven days. A copy of the Seven Day Inspection Form is attached as Appendix D.

3.14.2 30 Day Inspections

At intervals not exceeding 30 days, monitor all CCR unit instrumentation. The owner or operator of the CCR unit shall initiate the inspections required no later than October 19, 2015.

IPSC conducts inspections at intervals not exceeding 30 days. A copy of the 30 Day Inspection Form is attached as Appendix J.

3.14.3 Annual Inspections

The CCR unit shall additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The qualified professional engineer shall prepare a report following each inspection.

The owner or operator of the CCR unit shall complete the initial inspection required by no later than January 18, 2016.

The initial inspection report was completed by a qualified professional engineer as specified. IPSC provided notice to the Director of the availability of the report. The Initial Annual Inspection Report dated, January 18, 2016, and the notice letter are attached as Appendix E.

3.15 OPERATING CRITERIA – CCR LANDFILL INSPECTION REQUIREMENTS

The Intermountain Power Waste Water Basin (UT00468) is an existing CCR surface impoundment. Section R315-319-84 does not apply to existing CCR surface impoundments, so no information need be submitted under this section for the Intermountain Power Waste Water Basin (UT00468).

3.16 GROUNDWATER MONITORING AND CORRECTIVE ACTION

Section R315-319-90 requires that no later than October 17, 2017, the owner or operator of the CCR unit to be in compliance with the following groundwater monitoring requirements:

- (i) Install the groundwater monitoring system as required by Subsection R315-319-91;
- (ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by Subsection R315-319-93;
- (iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by Subsection R315-319-94(b); and
- (iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of Rule R315-319 as required by Subsection R315-319-94.

Section R315-319-90 requires that once a groundwater monitoring system and groundwater monitoring program has been established, the owner or operator shall conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator shall prepare an annual groundwater monitoring and corrective action report and forward the report to the Director by March 1 of each year.

Section R315-319-91 requires the owner or operator of a CCR unit to install a groundwater monitoring system consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer. The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information. The groundwater monitoring system shall include the minimum number of monitoring wells necessary to meet the performance standards specified in Subsection R315-319-91(a), based on the site-specific information specified in Subsection R315- 319-91(b).

The owner or operator shall obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of Section R315-319-91. If the groundwater monitoring system includes the minimum number of monitoring wells specified in Subsection R315-319-91(c)(1), the certification shall document the basis supporting this determination.

Section R315-319-93 requires the owner or operator of the CCR unit to develop and receive approval from the Director for a sampling and analysis program.

Section R315-319-94 requires the owner or operator of a CCR unit to conduct detection monitoring at all groundwater monitoring wells consistent with Section R315-319-94. A minimum of eight independent samples from each background and downgradient well shall be collected and analyzed for the constituents listed in appendix III and IV to Rule R315-319 no later than October 17, 2017.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under these sections. However, IPSC has installed a groundwater monitoring system and developed a groundwater sampling and analysis program. The Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report is attached as Appendix F and Ground Water Sampling and Analysis Plan is attached as Appendix G.

3.17 ASSESSMENT MONITORING PROGRAM

Section R315-319-95 requires assessment monitoring whenever a statistically significant increase over background levels has been detected for one or more of the constituents listed in appendix III to Rule R315-319.

Because IPSC has not detected a statistically significant increase over background levels for one or more of the constituents listed in appendix III to

Rule R315-319, no information need be submitted at this time under this section.

3.18 ASSESSMENT OF CORRECTIVE MEASURES

Section R315-319-96 requires that, within 90 days of finding that any constituent listed in appendix IV to Rule R315-319 has been detected at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or immediately upon detection of a release from a CCR unit, the owner or operator shall initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions.

Because IPSC has not detected any constituent listed in appendix IV to Rule R315-319 at a statistically significant level exceeding the groundwater protection standard defined under Subsection R315-319-95(h), or detected a release from a CCR unit, no information need be submitted at this time under this section.

3.19 SELECTION OF REMEDY

Section R315-319-97 requires that, based on the results of the corrective measures assessment conducted under Subsection R315-319-96, the owner or operator, as soon as feasible, select a remedy that, at a minimum, meets the standards listed in Subsection R315-319-97(b). The owner or operator shall prepare a semiannual report describing the progress in selecting and designing the remedy. Upon selection of a remedy, the owner or operator shall prepare a final report describing the selected remedy and how it meets the standards specified in Subsection R315-319-97(b). The remedy and report shall be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer that the remedy selected meets the requirements of Section R315-319-97. The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h)(12).

Because IPSC has not conducted the corrective measures assessment under Subsection R315-319-96, no information need be submitted at this time under this section.

3.20 IMPLEMENTATION OF THE CORRECTIVE ACTION PROGRAM

Section R315-319-98 requires that, within 90 days of selecting a remedy under Subsection R315-319-97, the owner or operator shall initiate remedial activities. If an owner or operator of the CCR unit determines, at any time, that compliance with the requirements of Subsection R315-319-97(b) is not being achieved through the remedy selected, the owner or operator shall, with approval of the Director, implement other methods or techniques that could feasibly achieve compliance with the requirements. Upon completion of the remedy, the owner or operator shall prepare a notification stating that the remedy has been completed. The notification shall be submitted to and be approved by the Director. The owner or operator shall obtain a certification from a qualified professional engineer attesting that the remedy has been completed in compliance with the requirements of Subsection R315-319-98(c). The report has been completed when it is placed in the operating record as required by Subsection R315-319-105(h) (13).

Because IPSC is not required to select a remedy under Subsection R315-319-97 at this time, no information need be submitted at this time under this section.

3.21 CLOSURE AND POST-CLOSURE CARE – INACTIVE CCR SURFACE IMPOUNDMENTS

Section R315-319-100 states that inactive CCR surface impoundments are subject to all of the requirements of Sections R315-319-50 through 107 applicable to existing CCR surface impoundments. Because IPSC does not have an inactive CCR surface impoundment at this time, no information need be submitted at this time under this section.

3.22 CLOSURE AND POST-CLOSURE CARE - CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-101 requires that the owner or operator of an existing unlined CCR surface impoundment, as determined under Subsection R315-319- 71(a), except as provided by Subsection R315-319-101(a)(3), if at any time after October 19, 2015 determines in any sampling event that the concentrations of one or more constituents listed in appendix IV to Rule R315-319 are detected at statistically significant levels above the groundwater protection standard established under Subsection R315-319-95(h) for such CCR unit, within six months of making such determination, cease placing CCR and non-CCR wastestreams into such CCR surface impoundment and either retrofit or close the CCR unit in accordance with the requirements of Subsection R315-319-102.

Because IPSC has not completed, and is not required to have completed before the application submittal date, the detection monitoring necessary to establish groundwater protection standards for the constituents in appendix IV to Rule R315-319, no information need be submitted at this time under this section.

3.23 CRITERIA FOR CONDUCTING THE CLOSURE OR RETROFIT OF CCR UNITS

Section R315-319-102 requires the owner or operator of a CCR unit to prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.24 CLOSURE AND POST-CLOSURE CARE – ALTERNATIVE CLOSURE REQUIREMENTS

Section R315-319-103 states alternative closure requirements. Because IPSC's CCR Units are not subject to closure at the time of the application submittal, no information need be submitted at this time under this section.

3.25 CLOSURE AND POST-CLOSURE CARE – POST-CLOSURE CARE REQUIREMENTS

Section R315-319-104 requires the owner or operator of a CCR unit to prepare a written post-closure plan and any amendments to the plan. The owner or operator of existing CCR landfills and existing CCR surface impoundments shall prepare an initial written closure plan no later than October 17, 2016.

Because the applicable effective dates have not been reached at the time of application submittal, no information need be submitted at this time under this section.

3.26 RECORDKEEPING REQUIREMENTS

Section R315-319-105 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain files of all information required by Section R315-319-105 in a written operating record at their facility. IPSC maintains a written operating record at their facility.

3.27 NOTIFICATION REQUIREMENTS

Section R315-319-106 requires that the notifications required under Subsections R315-319-106(e) through (i) shall be sent to the Director before the close of business on the day the notification is required to be completed. For purposes of Section R315-319-106, before the close of business means the notification shall be postmarked or sent by electronic mail (email). If a notification deadline falls on a weekend or federal holiday, the notification deadline is automatically extended to the next business day.

IPSC notified the Director of the availability of the CCR fugitive dust control plan (see Appendix C), the groundwater monitoring system certification (see Appendix F), and periodic inspection reports (see Appendix E) and will continue to provide notification as required under Section R315-319-106.

3.28 PUBLICALLY ACCESSIBLE INTERNET SITE REQUIREMENTS

Section R315-319-107 requires each owner or operator of a CCR unit subject to the requirements of Sections R315-319-50 through 107 to maintain a publicly accessible Internet site, CCR Web site, containing the information specified in Section R315-319-107. The owner or operator's Web site shall be titled "CCR Rule Compliance Data and Information." IPSC maintains a publicly accessible internet site titled CCR Rule Compliance Data and Information at http://ipscenvironmental.weebly.com accessible from IPSC's internet site http://ipsc.com.

3.29 NOTIFICATION TO NEIGHBORING PROPERTY OWNERS

Subsection R315-310-3(2) requires a permit application to provide the name and address of all owners of property within 1,000 feet of the proposed solid waste facility and documentation that a notice of intent to apply for a permit for a solid waste facility has been sent to all property owners identified. The Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration manage public property within 1,000 feet of the

Intermountain Generating Facility's CCR landfill. IPSC is the owner of all the property within 1,000 feet of the Intermountain Power Waste Water Basin (UT00468).

Notices of intent to apply for a permit for a solid waste facility have been sent to the Bureau of Land Management and the State of Utah School and Institutional Trust Land Administration (see Appendix H). The name and address of all owners of property within 1,000 feet of the Intermountain Generating Facility's CCR landfill are:

Director David Ure
State of Utah School and Institutional Trust Land Administration
675 East 500 South, Suite 500
Salt Lake City, UT 84102

Field Office Manager Michael Gates
Bureau of Land Management Fillmore Field Office
95 East 500 North
Fillmore, UT 84631

Lands in the immediate vicinity of the Intermountain Generating Facility are publicly owned desert range lands. These lands are designated Multiple Use and used primarily for livestock grazing and limited wildlife management. The ground surface of these lands is relatively flat, covered with native vegetation such as sagebrush, greasewood and rabbit brush. The nearest cultivated lands are located more than two miles southwest of the plant site in the Sugarville and Sutherland areas.

3.30 LOCAL GOVERNMENT

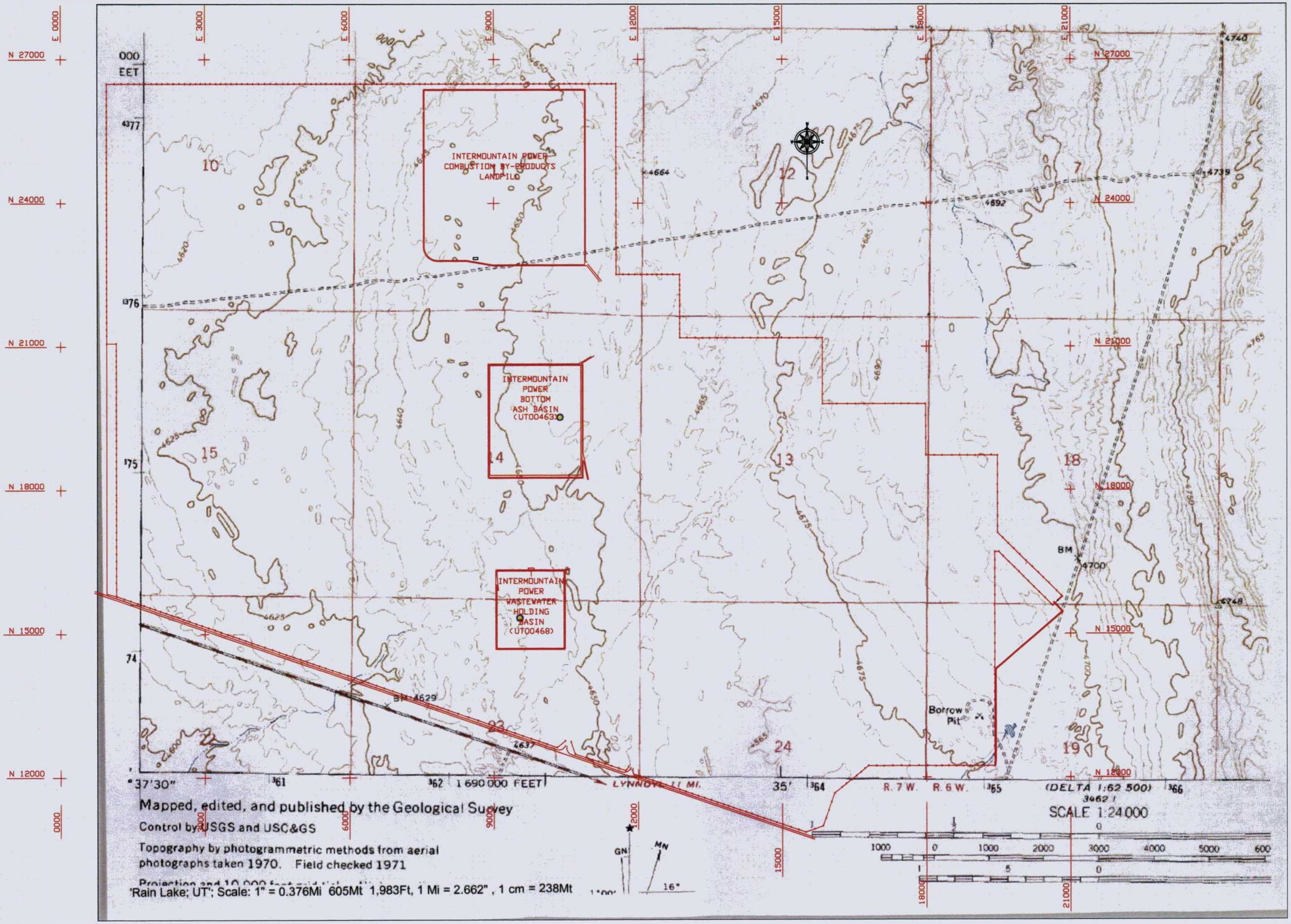
Subsection R315-310-3(2) also requires a permit application to provide the Director with the name of the local government with jurisdiction over the site and the mailing address of that local government office.

Millard County has jurisdiction over the site. Permission to operate IGF was obtained by IPA in the Conditional Use Permit granted by the Millard County Commission on January 5, 1981.

Millard County Delta Office
71 South 200 West
PO Box 854
Delta, Utah 84624

Millard County Fillmore Offices
50 South Main
Fillmore, Utah 84631

Appendix A.



INTERMOUNTAIN POWER
COMBUSTION BY-PRODUCTS
LANDFILL
INTERMOUNTAIN
POWER
BOTTOM
ASH BASIN
(UT00463)
INTERMOUNTAIN
POWER
WASTEWATER
HOLDING
BASIN
(UT00468)
10
12
7
15
14
13
18
23
24
19
Borrow
Pit
BM
4700
BM 4629
LYNNDYL 11 MI.
R. 7 W.
R. 6 W.
(DELTA 1:62 500)
SCALE 1:24 000
N 27000
N 24000
N 21000
N 18000
N 15000
N 12000
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1971
'Rain Lake; UT'; Scale: 1" = 0.376Mi 605Mt 1,983Ft, 1 Mi = 2.662" , 1 cm = 238Mt

Appendix B.

BIGHORN ARCHAEOLOGICAL CONSULTANTS, LLC
1791 NORTH 280 WEST
OREM, UTAH 84057
(801) 368-8091

Report Number 09-22

Phase I Archaeological Testing & Data Recovery Results for Site 42MD2343: The Intermountain Power Plant's Proposed Development of Sanitary and Combustion Byproducts Landfill Areas, Millard County, Utah

Prepared by

Jon Baxter
&
Robert Nash

for

Intermountain Power Service Corporation
Delta, Utah

Utah State Project Number: U09-HO-0520p

August 2009

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Introduction

Bighorn Archaeological Consultants, LLC (Bighorn) has completed archaeological testing and data recovery for site 42MD2343 located within the proposed expansion area of a combustion byproducts landfill cell at the Intermountain Power Plant near Delta, Millard County, Utah (Figure 1; Appendix A). Site 42MD2343 was recorded in September 2007 during a cultural resource inventory completed by Bighorn under State Project Authorization Number U07-HO-01120p (Christensen 2007) at the request of Intermountain Power Service Corporation. The site is considered eligible for listing on the National Register of Historic Places (NRHP), and testing was completed since the development of the combustion byproduct landfill expansion area will result in destruction of site 42MD2343.

Site 42MD2343 is exposed in the deflated blow-outs between small (ca. 8-m^2) dunes stabilized by vegetation, and was originally recorded as a low-density scatter of lithic debris with tool fragments (Figures 2 and 3). The site measured 65 m (northwest-southeast) by 40 m (southwest-northeast) and contained approximately 25 flakes, including obsidian, orange chert, white chert, red chert, and chalcedony. Original documentation of the site indicated tertiary flakes are dominant and secondary flakes are common, while primary flakes and shatter are relatively rare. Cores or core fragments were not observed at this site. Tools recorded consist of one obsidian biface fragment and one fire-cracked mano fragment (Christensen and Baxter 2008).

The testing and data recovery of the site was conducted as a phased approach. Phase I, reported here, includes surface collection and mapping followed by placement of three backhoe trenches and three 1 x 1 meter test units (Appendix A). The purpose of Phase I testing was to assess the potential for subsurface cultural deposits and, if encountered, determine the nature, integrity, and extent of such deposits. The discovery of subsurface features or occupation surfaces would then necessitate Phase II data recovery, which would include the excavation of cultural features. No subsurface features or occupation surfaces were encountered during Phase I; therefore, no Phase II data recovery will be conducted.

The site testing was carried out on 5 May 2009. The project was overseen and directed by Jon Baxter, Principal Investigator for Bighorn. Field supervisors for the project included Aaron Jordan and Jim Christensen, both with Bighorn. Artifact analysis was carried out in-house, with debitage analysis completed by Robert Nash.

Project Location

The Intermountain Power Plant's proposed sanitary landfill expansion area and the combustion byproducts landfill expansion area are located within the Sevier/Black Rock Desert of the Basin and Range Physiographic Province. Site 42MD2343 is located within T 15S, R 7W, Section 11 (USGS 7.5' Quadrangle: Rain Lake, Utah 1971; Figure 1; Appendix A)

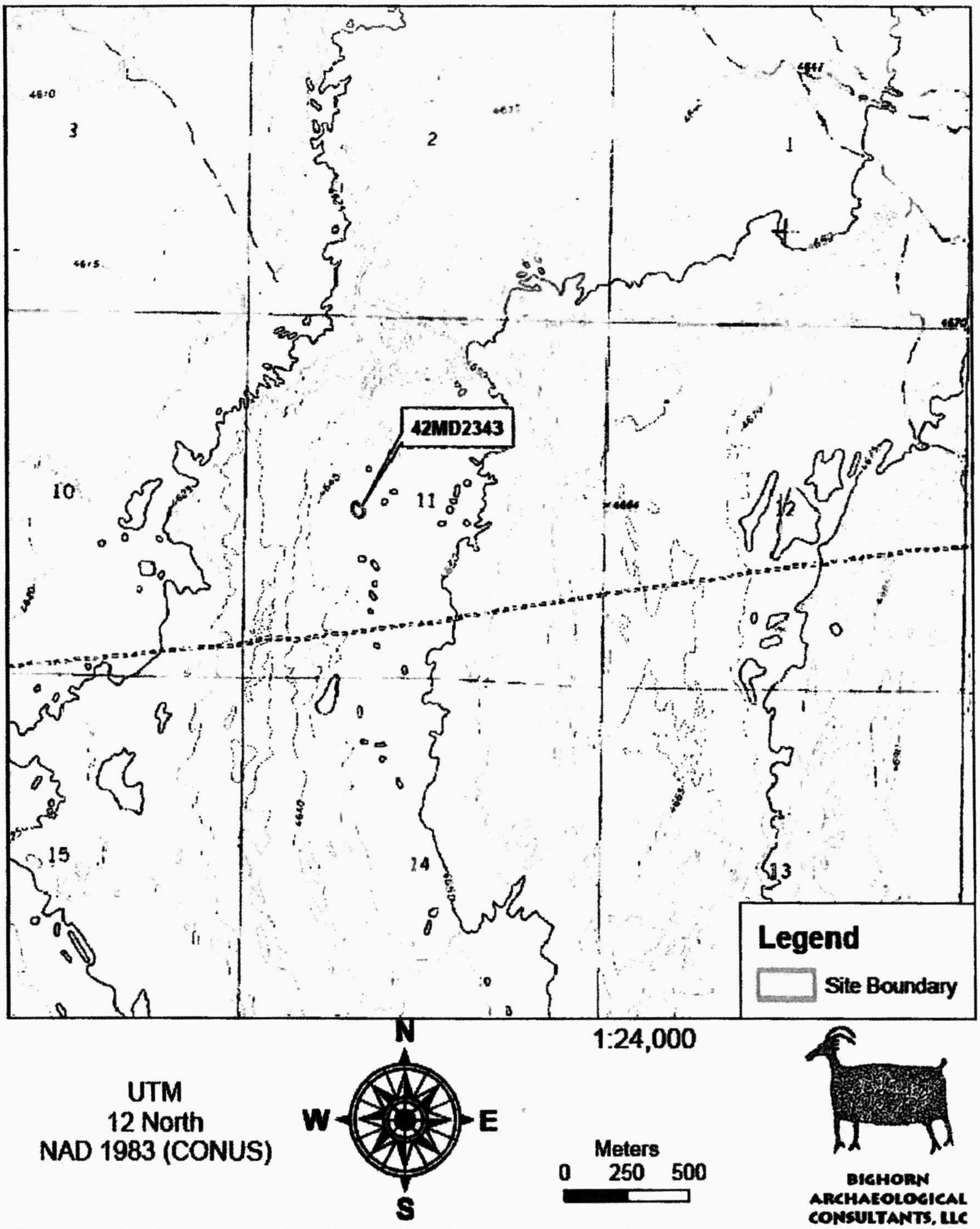

Figure 1. Site Location Map. USGS 7.5' Series Quadrangle: Rain Lake, Utah 1971, T 15S, R 7W.

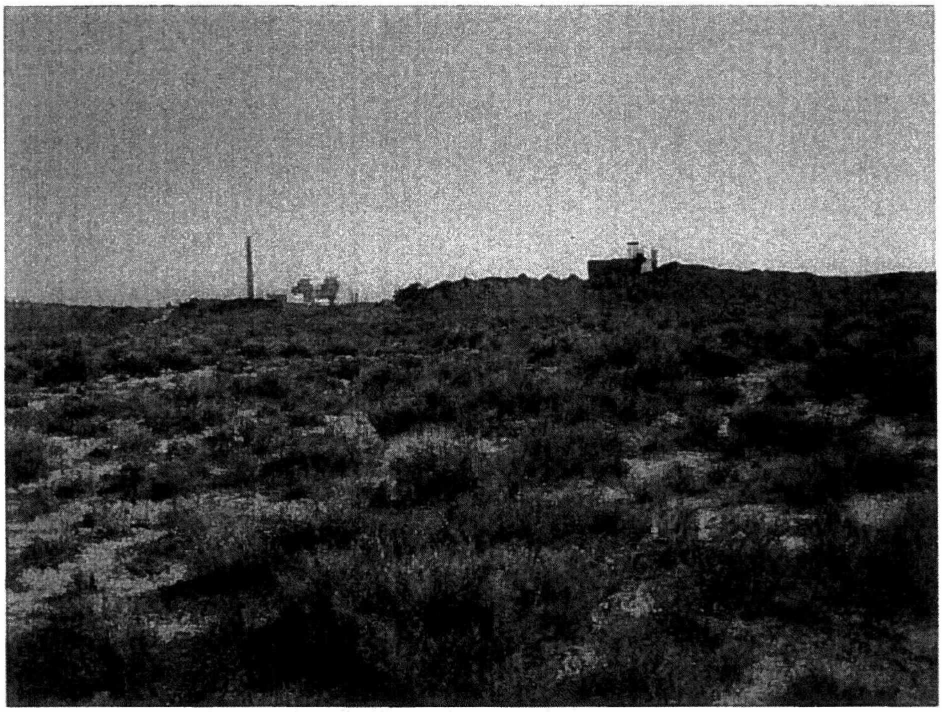

Figure 2. Site 42MD2343 overview looking Southeast.

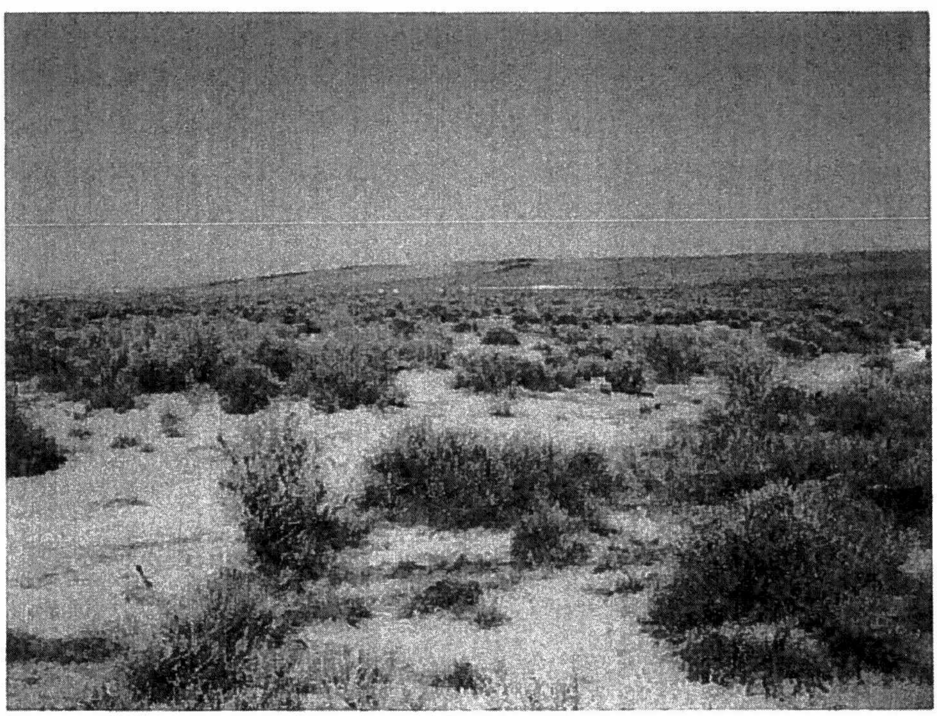

Figure 3. Site 42MD2343 overview looking Northeast.

Cultural Overview

The prehistory of Millard County and much of the rest of Utah can be broken down into a series of phases based on changing technologies, economies, and social systems. Figure 4 provides an overview of these phases, and each is discussed below.

Cultural Phase	Approximate Time Period
Paleoindian	11000 - 8000 BC
Archaic	8000 BC – AD 500
Formative (Fremont)	AD 500 - 1350
Late Prehistoric	AD 1350 - 1850
Historic	AD 1776 - 1950s

Figure 4. Culture chronology of project area.

Paleoindian

Considerable evidence is accumulating to indicate that the Americas were initially colonized during the Late Pleistocene sometime prior to 11,000 BC. Discoveries at sites such as Cactus Hill in Virginia suggest human occupation perhaps as early as 15,070±70 BP (McAvoy and McAvoy 1997:178). However, the earliest widespread and easily identified cultural complex in North America is known as Clovis, which dates from 11,500 to 10,900 BC, and is marked by the occurrence of large fluted lanceolate points (Fiedel 1999:102). Clovis is followed by another fluted point tradition known as Folsom, which dates from 11,000 to 10,500 BC. Following the end of the fluted tradition a number of lanceolate and stemmed point complexes continued, lasting to approximately 7000 BC.

There is increasing evidence throughout Utah of human occupation during this early phase. Although no known paleoindian sites are located within the project area, at least two paleoindian sites occur in Millard County. A Clovis affiliated site known as Hell'n Moriah (42MD1067) occurs in the Tule Valley (Davis et al. 1996). Hell'n Moriah is interpreted as a retooling station and contained 12 tools as well as 134 flakes. Site 42MD300 in Millard County and the Silverhorn site (42EM8) in Emery County to the east are apparently multi-component sites with cultural material from both Folsom and Stemmed point traditions (Gunnerson 1956; Simms and Lindsay 1989). Both sites appear to be residential camps. Another Paleoindian sites outside of Millard County is Lime Ridge (42SA16857) in San Juan County, attributable to the Clovis complex (Davis 1989). The site consists of a moderately dense scatter of chipped stone debris with approximately 35 tools and has been interpreted as a short-term camp or hunting station. The Montgomery site (42GR1956) in Green River County appears to be related to the Folsom complex (Davis 1985), and is interpreted as a base camp, consisting of more than 900 artifacts. The Martin site (42UT934) in Utah County at the southern end of Utah Lake produced Late Paleoindian Cody complex artifacts (Janetski 2001). Caves such as Danger and Hogup have also produced material attributed to the Paleoindian tradition (Jennings 1957; Aikens 1970). Most recently, ongoing excavations at the North Creek site near Escalante indicate deposits dating to over 7900 BC (Joel Janetski, personal communication 2009)

In addition to the documented archaeological sites, several diagnostic artifacts attributed to various Paleo-traditions have been reported as isolated surface finds across Utah. In southwestern Utah, two Clovis points from Iron County and three Folsom points from Iron and Garfield Counties were reported by Copeland and Fike (1988). According to Kohl (1991) two additional Clovis points were collected from Washington County. On the Arizona Strip, one isolated Clovis point was collected in Sullivan Canyon at site AZ:A:1:17 (Miller 1978). Great Basin Stemmed projectile points, such as the Silver Lake variety, have also been documented in southern Utah including one from Washington County (Gourley 2003) and one from site AZ:A:1:51 on the Middle Virgin River in the Arizona Strip (BLM site files).

Archaic

The end of the Pleistocene witnessed dramatic shifts in the natural environment in the Great Basin, from cooler and wetter to warmer and drier climatic conditions. This shift resulted in major changes in plant and animal resources. Pluvial lakes that existed during the Pleistocene disappeared, as did the megafauna that characterized the era. This climatic change had a significant impact on the human occupants of the region as well (Grayson 1993).

The Archaic Stage generally dates between 8000 B.C. to ca. A.D. 500, with localized variations occurring from region to region. The Archaic across the west is characterized by a wide variety of large dart points, seasonal movements responding to changing environmental patterns, short-term occupation of open sites, along with occasional longer occupations of caves or rock shelters, and the development of resource storage (Berry and Berry 1986; Kelly 1997). The atlatl, or throwing stick, armed with a dart was the primary hunting implement. Dart point styles diagnostic of this stage include Elko Corner-notch, Elko Eared, Pinto, Gatecliff Split stem, Humboldt, Northern Side-notch, Sudden Side-notch, Hawken Side-notch, San Rafael Side-notch, and Gypsum points (Holmer 1986). Some projectile point styles, such as the Elko series and Gypsum points, continued to be made and used into later stages of cultural development.

Hunter-gatherer sites dating to this era have been well documented throughout the Intermountain region. Within Utah Valley, American Fork Cave suggests an exploitation of mountain sheep, waterfowl, and fish from the Provo River and Utah Lake (Janetski et al. 2007; Mock 1971; Hansen and Stokes 1938).

The Archaic period ends with the introduction of horticulture in the region about 2000 years ago (Geib 1996:35). The transition from a hunting and gathering society to one more dependent on horticulture is a process that has generated unremitting archaeological debate. Most of the debate is spurred on more by individual theoretical orientation than hard data. Scattered examples of some of the characteristics that mark the subsequent Fremont Culture during the Formative period, including permanent habitation structures and the presence of domesticates, have been found in sites that pre-date the traditional beginning of the Fremont Culture around A.D. 500. The end of the Archaic and the beginning of the Formative, therefore, is defined by a transition from a hunter-gatherer economy to a low-level food production economy (Smith 2001) involving horticulture and hunting and gathering. This transition period appears to retain similarities with the previous Archaic stage such as a heavy emphasis on hunting and gathering, continued use of the atlatl and dart, and a lack of ceramics.

Formative

The Formative is marked by the adoption and spread of horticulture, the rise and development of sedentary settlements, and later the introduction of ceramics. In most of Utah, these changes are characteristic of the Fremont Culture. The Fremont period begins with the introduction of maize, which appears in a few sites between 200 BC and AD 200 (Talbot and Richens 1996:115). However, maize is not widespread in the eastern Great Basin and Colorado Plateau until the introduction of ceramics around AD 400. The adoption of domestic crops resulted in a much different lifestyle, including a shift to a more sedentary settlement pattern as well as the introduction of new technologies and the modification of older ones. While some (Aikens and Madsen 1986) suggest that the Fremont Culture was simply a technological adaptation by indigenous population, others (c.f. Lindsay 1986) suggest that the Fremont arose from significant influences or perhaps population movements from the Southwest and the Great Plains.

One of the more notable characteristics of the Fremont period is the development of multi-component habitations with surface storage, and later, the development of larger aggregated village sites. The first permanent Fremont structures were usually small, circular or semicircular pits and associated with small storage units. Habitation structures gradually shifted to larger quadrilateral domiciles at the end of the Fremont Period (about 1350 A.D). Large mound villages were concentrated along or near permanent and semi-permanent streams. Seasonal habitations were located in more marginal or higher altitude resource areas (Billat 1983)
A significant change in lithic technology occurred during this period with the advent of smaller, more finely made points associated with the introduction of the bow and arrow. Typical projectie points of the period are the Rose Spring/Eastgate series, Uintah Side-notch, Nawthis Side-notch, and Bull Creek points. Other point styles include the Parowan Basal-notch and Cottonwood Triangular (Holmer 1978; Holmer and Weeder 1980).

Another significant characteristic of the Fremont is the development of ceramic technology. Early forms of pottery tended to be plain grayware, which remained common throughout the period. During the latter portion of the period, painted decorative techniques were used. Ceramics from the southwestern cultures were often traded into Fremont sites.
Finally, as with the advent of horticulture, grinding implements became more specialized and common than in the Archaic Period. One such tool, the "Utah" metate is a trough styled grinding tool with a "shelf" or resting platform on one end for the mano. These grinding stones are found throughout the region and are considered to be temporally diagnostic of this period. Fremont villages were common in Utah Valley and were concentrated around Utah Lake. Examples of Fremont sites include Woodard Mound (Richens 1983) in Goshen Valley, Smoking Pipe (Billet 1983) near the Provo River, Seamonds Mound (Forsyth 1986), and the Hinckley mounds (Green 1961). Early researchers noted hundreds of mounds in the valley (Janetski 1990), but most have disappeared under the relentless development of agriculture, industry and urban spread.

Late Prehistoric

Another shift in subsistence strategies occurred after A.D. 1300. This shift is marked by a return to the Archaic way of life of hunting and gathering. Utah Lake, for instance, provided a lacastral resource, which included waterfowl and several species of fish. Several spawning areas are located at both the mouth of the Provo and Jordan Rivers. Although hunting and gathering was the strategy employed, the rich resource base of Utah Valley may have provided a base for larger villages and longer occupations than at other locations in Utah. The bow and arrow appears to have been the overwhelming choice in hunting technology. Small projectile points dominated the lithic assemblage. Point styles included the Desert Side-notch series, Cottonwood Triangular, and small corner-notched points (Holmer and Weeder 1980). Ceramic technology was not as elaborate as it had been during the Fremont Period. Vessel shapes were flowerpot, globular, and conical shaped. Decoration was minimal and tended to be restricted to fingernail impressions. Late Prehistoric ceramics tended to be thick with coil and rough smoothing techniques as opposed to the thin, polished and painted Fremont ceramics. The more mobile Late Prehistoric inhabitants did, however, have significantly superior basketry and leather working.

The Late Prehistoric period spans the establishment of Numic speaking socio-cultural groups following the collapse of Formative cultures in the region. The living descendents of the Numic-speaking peoples are the Northern and Southern Paiute, the Ute, Shoshone, and Goshute. The project area was inhabited primarily by Southern Paiute groups. Generally it is believed that this phase began around AD 1200, continuing until the establishment of permanent Euro-American settlements in the area. The movement of Numic speaking peoples from the Southwest across the Great Basin and the Colorado Plateau is a subject of much speculation and debate. Linguistic data suggests that Numic speakers began to expand from the Mojave Desert region sometime around AD 1000. The cause of the Numic expansion is poorly understood (see Simms 1994), although some researchers have suggested deteriorating environmental conditions (Fowler et al. 1973; Lamb 1958). While the beginning of the Late Prehistoric period is marked by the disappearance of Formative cultures in the region, the end is represented by the start of indirect influences from the Spanish following the establishment of colonies in New Mexico and California ca. AD 1600.

Historic

The earliest known European exploration in Utah occurred in 1776 with the Dominguez-Escalante expedition. Fray Francisco Antanasio Dominguez and Fray Silvestre Velez de Escalante were Franciscan monks who led an expedition sponsored by the Spanish government to discover an overland route from Santa Fe, New Mexico through Utah to the San Francisco area of California. They traveled northwest from Santa Fe, and eventually reached the area of Utah Lake. Given the lateness of the season, however, they were forced to abandon their hopes of reaching California and turned south-southwest to return to Santa Fe. Members of the Dominguez-Escalante expedition entered present day Millard County from the north on their return home, reaching the Scipio area on 30 September 1776. The following day, the party headed west in search of water, turning south again near present-day Deseret. On 2 October 1776, after having sent a small group in search of water, a few of the party members returned with some "full-bearded and pierce nose [Indians], who called themselves Tirangapui in their language" (Warner 1995:79); these were likely Southern Paiute Indians. This was a brief, friendly encounter during which time the Indians helped locate a lost member of the Dominguez-Escalante party and the expedition members "announced the Gospel to them as well as the interpreter could manage it" (Warner 1995:80). Also, the mapmaker for the expedition, Don Bernardo Miera y Pacheco, sketched the shore of the Sevier Lake with an outlet to the Pacific Ocean. This began a myth that persisted until the more careful explorations of John C. Fremont and others over a half century later. The Dominguez-Escalante expedition members continued southward, and left Millard County on 8 October 1776 before continuing on towards Milford (Warner 1995; Lyman and Newell 1999:24).

The missions and settlements anticipated by Dominguez and Escalante never materialized. By the turn of the nineteenth century, however, a considerable amount of trade had ensued between the Spaniards of New Mexico and Ute Indians of Utah. In exchange for blankets, weapons, and other manufactured goods, the Indians traded furs, hides, horses, and human slaves, primarily Paiute Indians. In 1821, the Great Basin became the domain of the Mexican government after Mexico won independence from Spain. Shortly thereafter, Mexican traders dealt in Indian slaves until the early 1850s when the Utah Territorial Legislature and Governor Brigham Young made Indian slave trade illegal in Utah (Lyman and Newell 1999:24-25).

Long before Mormon colonization, however, several Anglo-American explorers and trappers traversed the Great Basin, including Millard County. In 1826, Jedediah Smith and his party traveled through future northeastern Millard County as they headed south up the Sevier River in search of beaver. At Clear Creek Canyon the expedition turned west and descended to the area near future Cove Fort, and then followed segments of the Ute Indian trade route to southern California. On his second expedition, Jedediah Smith again traversed northeastern Millard County, where he encountered Paiute and Sanpitch Ute Indians. By 1830, pack trains were regular using the Old Spanish Trail and its variants (Lyman and Newell 1999:25-26).

The settlement of Utah and Millard County was aided by the report of John C. Fremont's scientific exploration of Utah and the West in 1843-144. Published in 1845, Fremont's report was carefully studied by the leaders of the Church of Jesus Christ of Latter-day Saints as they searched for a new location to colonize. After the Mormons settled in Salt Lake Valley in 1847, Young soon assigned expeditions to explore various parts of the region. The first Mormon expedition to visit Pahvant Valley occurred in 1847 by a small company of about a dozen men on their way to southern California to purchase livestock and seed. The group crossed Scipio Pass and then traveled along the eastern edge of the Pahvant Valley, giving the members a view of what would become Millard County (Lyman and Newell 1999:31-32). Four years and several Mormon expeditions later, Brigham Young directed Anson Call to "locate a suitable place to make a settlement and then come to Salt Lake City to report and then raise fifty families and go settle [Pahvant Valley]" (Lyman and Newell 1999:40). Call immediately set out for Pahvant Valley, and when he returned to Salt Lake City he claimed that Chalk Creek was an ideal setting for a town.

Even as Call and his company prepared to colonize Pahvant Valley, the territorial legislature meeting in Salt Lake City decided that the territorial capital should be located near the geographical center of the Utah Territory, which had been established the previous year. By a legislative act of 4 October 1851, the joint legislative assemblies designated Pahvant Valley as the seat of government and at the same time created Millard County with Fillmore City as the county seat and location of the territorial capital. The act divided the new county from neighboring Iron County and authorized Anson Call to organize the new county government. On 18 October 1851, Call's company of about one hundred men, women, and children left Salt Lake City for Pahvant Valley to settle the town of Fillmore. A second party of church and government leaders departed Salt Lake City on 21 October to survey the yet-to-be-settled town of Fillmore and to select a site for the territorial capitol building (Lyman and Newell 1999:40-41). According to an unofficial Mormon Church census, the population of Millard County reached 300 people in 1852, and continued to climb (Lyman and Newell 1999).

Research Questions

Testing and data recovery of the site was guided by research questions that focus on collecting data sets that will contribute additional information on the aboriginal occupation and utilization of the area in the past. Surface indications recorded for Site 42MD2343 are suggestive of a short-term campsite and lithic tool production area dating from the general Archaic or Late Prehistoric cultural phases, though additional information would be useful in refining the understanding of this site's temporal affiliation.

Cultural Affiliation

Establishing a firm chronology for Site 42MD2343 would help place the site within a larger local and regional context, enhancing the understanding of this site's role within a local subsistence economy. The prehistory of the eastern Great Basin is generally broken down into a series of developmental stages based on changing technologies, economics, and social systems. Regional studies suggest that patterns of prehistoric land use in the region are similar to those identified by Jennings (1978) and Madsen (1982) for the eastern Great Basin. Briefly, these patterns include the Paleoindian, a time usually thought to represent a period of specialized big-game hunting beginning as early as 20,000 BC and lasting until roughly 6,500 BC. This was followed by a period of hunting and gathering referred to as the Archaic. Thereafter, between approximately AD 400 and AD 1350, part-and full-time farmers known as the Fremont, many living in villages, occupied the region. At the close of this period, farming rather abruptly disappeared and hunting and gathering again became the primary means of subsistence for groups during the Late Prehistoric period into the historical era. Developing a more refined chronology and cultural affiliation for these sites will be accomplished through collection of obsidian samples for hydration dating and, should features possessing sufficient samples of dateable carbon be encountered, radiocarbon samples.

Subsistence

Faunal remains and pollen samples, should they be recovered, would provide data concerning the economic lifeways of the groups inhabiting the sites. From such samples determinations can be made on whether the occupants relied on hunting and foraging, such as would be expected with Archaic groups, or on hunting, foraging, and agriculture, or any combination of these activities, as might be expected with Formative and Late Prehistoric groups. Samples for flotation and pollen analysis, as well as faunal remains, will be collected from any features encountered, as well as from general subsurface contexts.

Site Function

By examining the relationship between various artifacts, deposits, and features (if present) site function may be discernable. If features are exposed they may indicate the occupation sequences and abandonment of the site. Also, the types of features may indicate how intensively the site was occupied at any given time. For example, the occurrence of well-made hearths or fire-pits, as well as habitation structures, would indicate that the site was occupied for a relatively longer duration than if the features were expediently constructed. The size and number of related features may also give some idea of the relative number of people on the site at any given time. The occurrence of well-constructed shelters (semi-subterranean house pits), of Archaic date, though relatively rare in southern Utah, may indicate a less nomadic, somewhat semi-sedentary, lifestyle. Possible pit structures or dwellings then can be compared with other such features to examine relationships between sites and cultural complexes. The distribution of artifact types may also indicate specific activity areas across the site.

Craft Specialization & Trade

A growing body of evidence suggests that some craft specialization occurs even within small-scale societies (i.e. Allison 2000). Although economies of small-scale societies are most often shown as undifferentiated, with every household practicing the same activities, both ethnological and archaeological evidence illustrates that some part-time or full-time specialists can be found. The presence of craft specialization then suggests inter-societal exchange may be occurring in which goods and services are being exchanged between both members of the community or other communities. These reasons for this may be multi-fold, spanning economic distribution or some political or religious reason, and may help to tie individuals or groups together socially. Certain artifacts, such as personal ornaments made from exotic materials, as well as obsidian artifacts, may indicate evidence of long distance trade. The occurrence of obsidian, marine shell, or turquoise may indicate some interaction between different cultural groups. Exotic trade goods may also give some indication of individual status among the inhabitants as well.

Seasonality & Mobility

Examination of botanical remains and faunal remains may provide information concerning the seasonality of site occupation. Likewise, some faunal remains and botanical remains may also indicate the level of mobility practiced by the inhabitants. For example, faunal remains of specific lucustrine animals, macrobotanical evidence of specific plants, or plant processing tools may suggest seasonal exploitation of local resources. The occurrence of non-local or exotic raw materials, such as tool stone, may also indicate mobility, but this may also represent trade as well. Unique types of raw materials, such as obsidian or other tool stone, may occur in a limited geographical location and may also indicate mobility, especially direction of movement. Of course, many plants species are only available during certain time of the year and a substantial quantity of pollen or macrobotanical remains of these plants may indicate the season (or seasons) in which the site was occupied.

Testing Methods

Phase I testing and data recovery has been completed, and included surface collection and mapping followed by placement of three backhoe trenches and three 1 x 1 meter tests units. Soil phosphate prospection was carried out in order to better delineate and understand possible use areas and concentrations of cultural material on site. The test trenches and test units were placed in areas indicated by soil phosphate extraction as areas of high potential for cultural soil. (Appendix A).

Mapping

Detailed site contour maps were produced and were based on a permanent datum that was placed on the site. Although general site plan maps were made during the original recording of the site, new information was included, such as precise elevation contours and detailed locations of additional cultural remains and testing locations. Surface artifacts were collected at this time, and were limited to significant artifacts, such as tools, ceramic sherds, obsidian, and bone.

Testing

Soil phosphate prospection was used to identify high potential areas to place the test trenches and test pits. This is a method whereby phosphates resulting from organic residues in anthropogenic soils are extracted and analyzed to determine where prehistoric soil enrichment has occurred. Prehistoric phosphate enrichment in soils results from activities such as cooking, refuse disposal, butchering, and other cultural activities that generate organic residues (Dahlin et al. 2007). A grid was established over the site and extended to cover the site itself and immediately surrounding area. Soils were sampled at five-meter intervals and collected for laboratory analysis. The soils were analyzed for extractable phosphate and the results were mapped with geostatistical software.

Analysis results indicated that the phosphate background level for the site was 22.7 mg/kg. Concentrations on the site ranged from background levels to 75.2 mg/kg. The map (Figure 5) indicated that the highest concentrations of soil phosphate were located within the dunes identified on the site. Backhoe trenches were excavated across the site in areas of both high and low P concentrations, and test pits were placed within the site in correlation with some of these areas.

Three backhoe trenches were placed in high potential areas across the site in order to explore any subsurface cultural deposits, stratigraphy, and confirm the depth of sterile, undisturbed deposits or bedrock (Figures 6-8; Appendix A). Trenching was carefully monitored during excavation, and trench walls were examined for any exposed subsurface cultural features or occupation surfaces evidenced by ash or charcoal staining. Testing also included three 1 x 1 meter test units to explore subsurface cultural deposits, stratigraphy, and confirm undisturbed deposits (Figures 9-11; Appendix A). Fill removed during trenching was not screened, since the object of this procedure was to locate features and not to quantify the deposits.

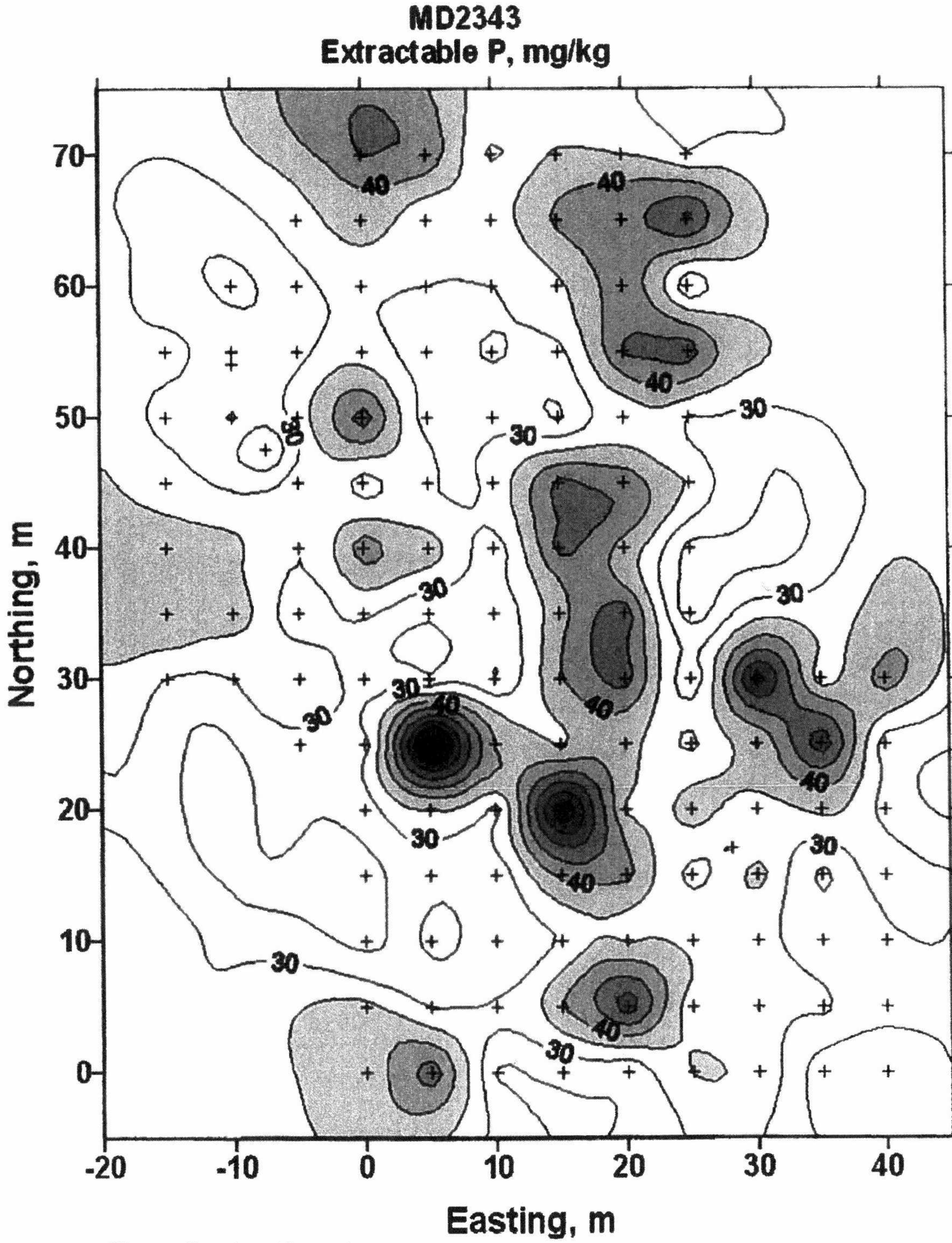

Figure 5. Site 42MD2343 soil phosphate map.

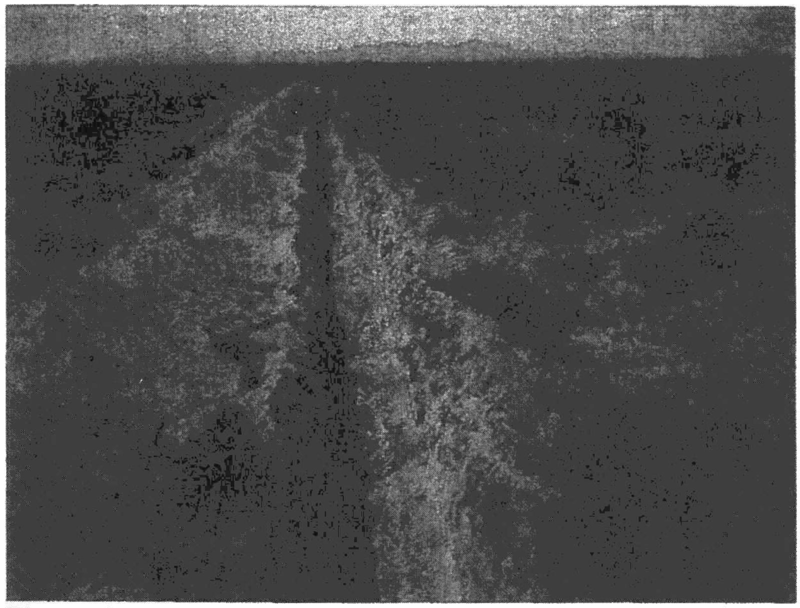

Figure 6. Overview of Test Trench 1, looking east.

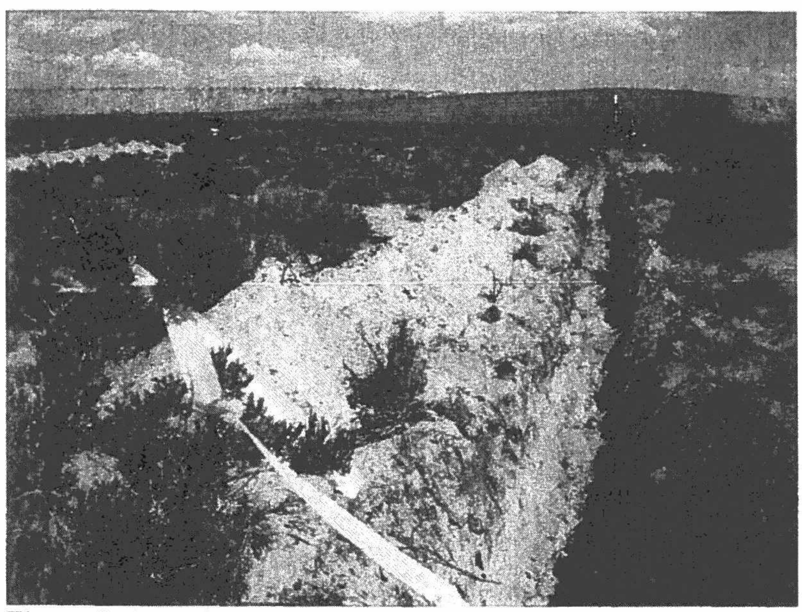

Figure 7. Overview of Test Trench 2, looking east.

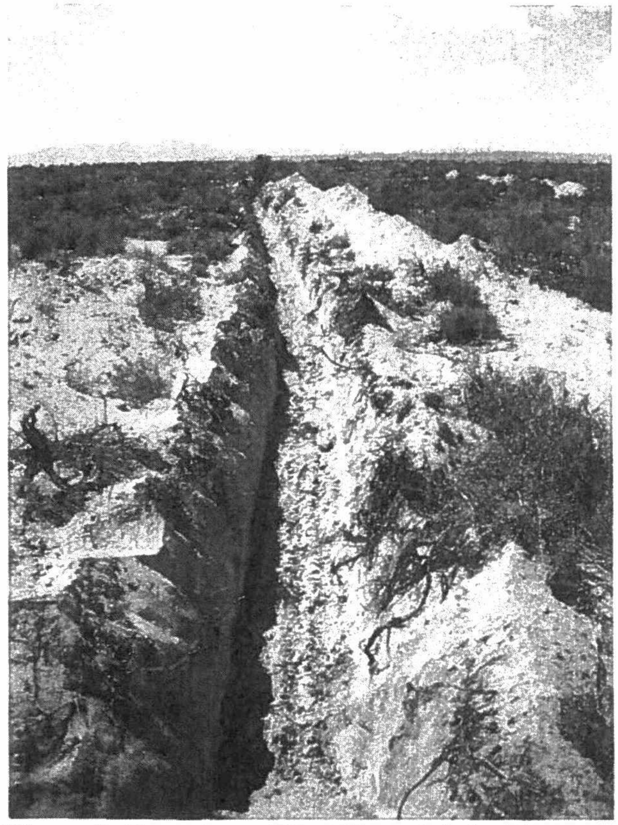

Figure 8. Overview of Test Trench 3, looking west.

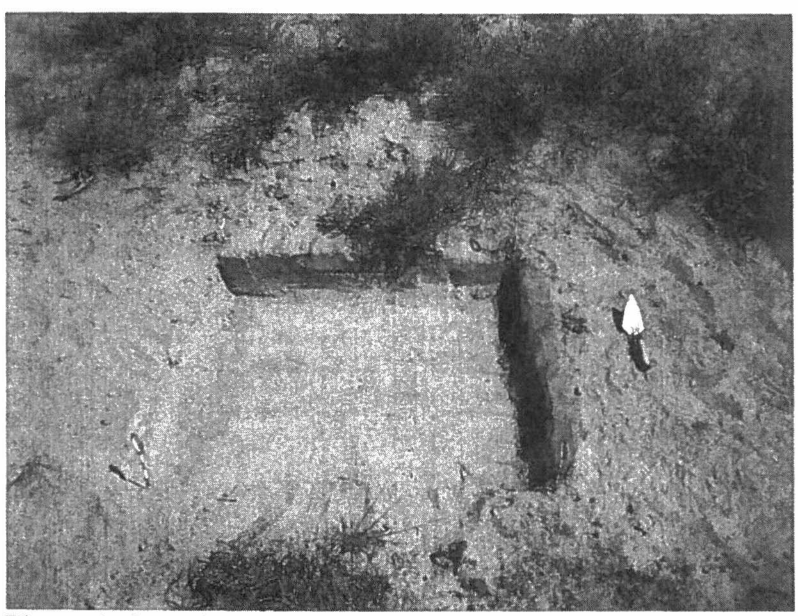

Figure 9. Overview of Test Pit 1, looking east.

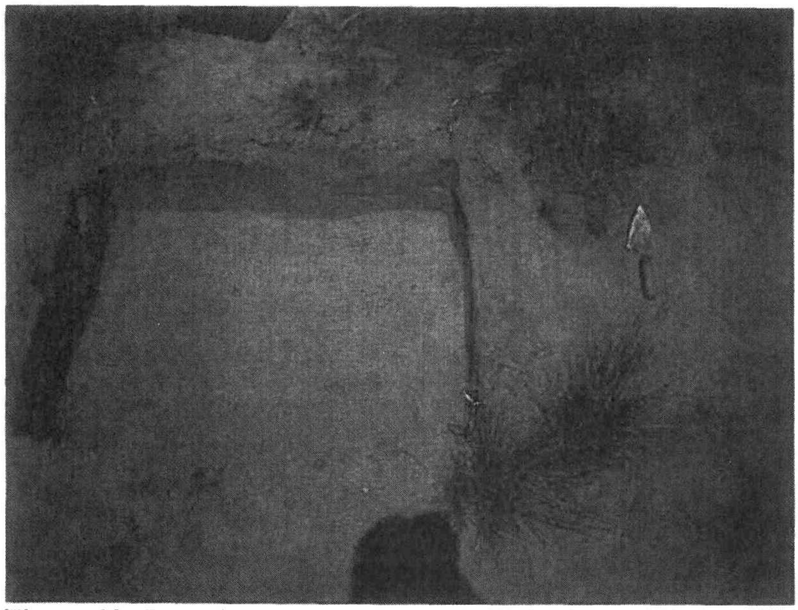

Figure 10. Overview of Test Unit 2 looking North.

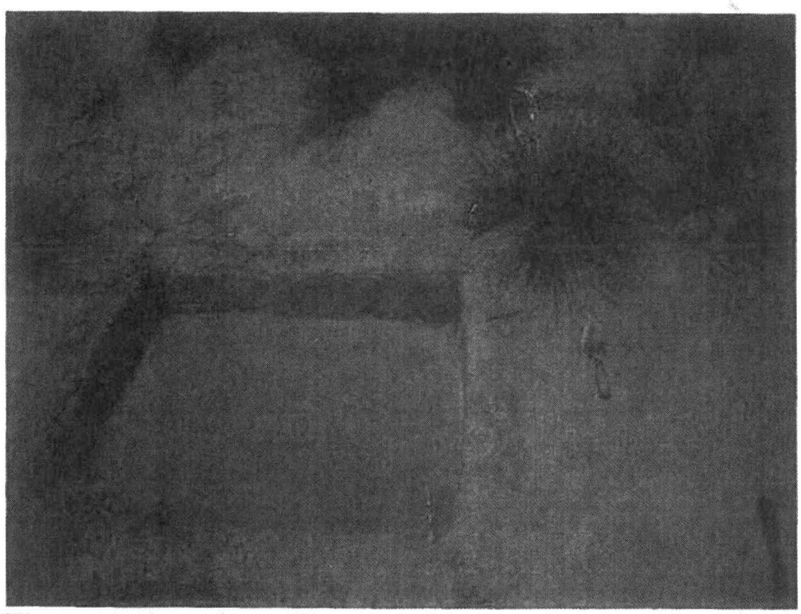

Figure 11. Overview of Test Unit 3 looking North.

Testing Results

Testing of site 42MD2343 consisted of the excavation of three backhoe trenches and three 1m x 1m test units. The backhoe trenches were all excavated east-west across the site. No features or artifact concentrations were identified during the testing; however, a few artifacts were observed and collected in two of the 1m x 1m test pits.

Soil Phosphate

Due to the lack of cultural fill encountered during archaeological testing, the correlation between elevated p concentrations and sub-surface cultural materials was inconclusive. However, the soil chemical pattern that emerges across the surface of the site appears to shed light on possible use areas during the limited occupation of the site (Figure 5). Coupled with the limited lithic debitage identified on the site, the soil P concentrations may demonstrate possible cooking or eating areas that may have been in use.

Test Trench 1

Test Trench 1 (Figure 6) was excavated in the north end of the site, and was 62 meters long. The trench did not reveal any features, and no artifacts were observed.

Test Trench 2

Test Trench 2 (Figure 7) was excavated in the middle of the site, and was 54 meters long. The trench did not reveal any features, and no artifacts were observed.

Test Trench 3

Test Trench 3 (Figure 8) was excavated in the south end of the site, and was 48 meters long. The trench did not reveal any features, and no artifacts were observed.

Test Unit 1

Test Unit 1 (Figure 9) was excavated to a depth of 30 cmbs, and consisted of a light tan, well-sorted soil that did not evince any breaks in the stratigraphy. This test unit did not reveal any features, but a single piece of obsidian debitage was collected at a depth of 10-20 cmbs.

Test Unit 2

Test Unit 2 (Figure 10) was excavated to a depth of 30 cmbs. The first 5 cm were loose dune deposits, below which was lightly compacted, light tan, well-sorted soil that did not evince any further breaks in the stratigraphy. This test unit did not reveal any features, and no artifacts were observed.

Test Unit 3

Test Unit 3 (Figure 11) was excavated to a depth of 30 cmbs. The first 5 cm were loose dune deposits, below which was lightly compacted, light tan, well-sorted soil that did not evince any further breaks in the stratigraphy. This test unit did not reveal any features; however, two pieces of obsidian debitage and one piece of chert debitage was collected from this unit. One of the obsidian pieces came from a depth of 0-5 cmbs, the other two pieces of debitage were collected from a depth of 10-20 cmbs.

Material Culture

A total of 17 artifacts were collected from 42MD2343. Nearly the entire assemblage is comprised of debitage; however, one biface and one ground stone fragment were also recovered. No ceramics or faunal material was recovered.

Debitage

A total of 15 flakes were recovered (Table 1). Most of the flakes were interior core reduction flakes (n=12), comprising 80 percent of the debitage assemblage. Two pieces of shatter, and one secondary flake were also present. Apart from a single piece of chert shatter, all of the debitage was obsidian. Five of the obsidian flakes were utilized, of which one secondary flake exhibited retouch along a single edge.

Chipped Stone Tools

A single obsidian late-stage biface was recovered from the surface of the site (Figure 12). The biface appears to be a bell-shaped base of a larger tool; the base measures 18.5 x 22.6 x 4.4 mm.

Table 1: Site 42MD2343 Debitage.

Location	Depth (cmbs)	Material	Stage	Utilized	Length (mm)	Width (mm)	Thickness (mm)	Comments
test pit 1	10-20	obsidian	ICR	-	10.8	10.4	1.5	
surface	-	obsidian	ICR	Yes	19.8	16.0	1.6	
surface	-	obsidian	shatter	-	10.8	7.7	6.3	
surface	-	obsidian	ICR	-	20.8	11.3	1.6	
surface	-	obsidian	ICR	Yes	20.2	11.9	3.6	
surface	-	obsidian	ICR	Yes	21.8	8.9	2.6	
surface	-	obsidian	secondary	Yes	23.8	20.4	3.6	retouched
surface	-	obsidian	ICR	-	17.2	10.2	1.5	
surface	-	obsidian	ICR	-	19.6	17.4	2.5	
surface	-	obsidian	ICR	Yes	23.3	8.0	3.1	
surface	-	obsidian	ICR	-	8.2	15.7	2.3	
surface	-	obsidian	ICR	-	7.5	12.1	1.1	
test pit 3	10-20	obsidian	ICR	-	12.0	13.1	3.7	
test pit 3	10-20	chert	shatter	-	7.8	7.4	4.9	
test pit 3	0-5	obsidian	ICR	-	16.0	17.3	3.4	

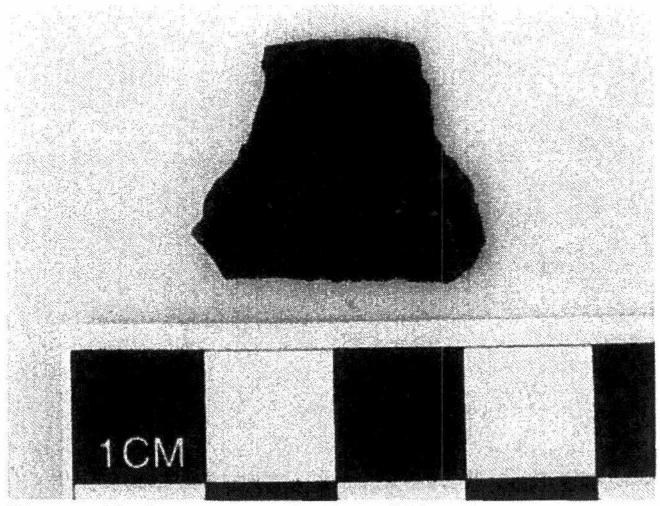

Figure 12. Late stage obsidian biface base.

Ground Stone

A single basalt ground stone fragment was collected from the surface of site 42MD2343. The fragment is shaped, and exhibits some pecking, but it is difficult to tell whether it represents a mano or a metate fragment. The fragment measures 9.0 x 5.2 x 3.4 cm.

Obsidian Sourcing

Eight obsidian samples were submitted to Geochemical Research Laboratory for energy dispersive x-ray fluorescence (edxrf) analysis in order to identify the source(s) of obsidian recovered from site 42MD2343. Analysis results indicate five of the specimens were made from Black Rock area obsidian and three others have the same trace element profile as Topaz Mountain obsidian (Appendix B).

Dating

Neither diagnostic artifacts nor organic material were recovered from site 42MD2343, precluding the use of either cross-dating or radiocarbon analysis in dating the site. Site 42MD2343 did contain numerous obsidian tools and debitage, however, and several of these were submitted for obsidian hydration analysis. Following energy dispersive x-ray fluorescence analysis, the eight obsidian samples were submitted to Origer's Obsidian Laboratory for obsidian hydration analysis (Table 2). The range of dates indicate Archaic occupation of the site (Appendix C).

Table 2: Obsidian Hydration Analysis

Hydration Laboratory #	Hydration Band (in microns)	Rate Adjusted Hydration Band	EHT Adjusted Hydration Band	Date (in years before present)
1	3.6	4.0	4.2	2,706
2	4.7	6.6	7.0	7,517
3	3.6	5.1	5.4	4,473
4	5.0	7.1	7.5	8,629
5	3.2	3.6	3.8	2,215
6	3.6	4.0	4.2	2,706
7	3.3	3.7	3.9	2,333
8	3.4	3.8	4.0	2,454

Discussion

Only limited testing was possible; therefore, there is not sufficient data to address many of the research objectives. The cultural affiliation of the site was determined through obsidian hydration analysis, since neither diagnostic artifacts nor radiocarbon samples were recovered from the site. Obsidian hydration analysis indicates the site dates to the Archaic period, with dates ranging from 8629-2215 BP. Faunal remains were absent from site 42MD2343, and no pollen or macrofossil samples were analyzed; therefore, there is no direct evidence for the subsistence of groups inhabiting this site. The absence of botanical and faunal remains further precludes discussion on mobility and seasonality. The recovery of ground stone, however, suggests seed processing occurred at the site. The presence of ground stone may also be an indication that the site was occupied during the summer, when seeds are most plentiful, but without other direct evidence this is only an inference. No formal features were encountered during testing of the site, so little more can be said regarding site functionality. Site 42MD2343 was likely no more than an ephemeral overnight camp or retooling location. Apart from the lack of features, the ephemeral nature of this site is further suggested by the lack of formal chipped stone tools in comparison to the greater abundance of retouched and utilized flakes, which represent expedient waste flakes for cutting or scraping, and were likely discarded following use.

Conclusion

Bighorn Archaeological Consultants, LLC (Bighorn) has completed archaeological testing and data recovery for site 42MD2343 located within the proposed expansion area of a combustion byproducts landfill cell at the Intermountain Power Plant near Delta, Millard County, Utah. This work was completed since the development of the combustion byproduct landfill expansion area will result in destruction of site 42MD2343. The work was completed by Bighorn under State Project Authorization Number U07-HO-01120p (Christensen 2007) at the request of Intermountain Power Service Corporation.

The testing and data recovery of the site was conducted as a phased approach. Phase I, reported here, includes surface collection and mapping followed by placement of three backhoe trenches and three 1 x 1 meter test units. The purpose of Phase I testing was to assess the potential for subsurface cultural deposits and, if encountered, determine the nature, integrity, and extent of such deposits. The discovery of subsurface features or occupation surfaces would then necessitate Phase II data recovery, which would include the excavation of cultural features. No subsurface features or occupation surfaces were encountered during Phase I; therefore, Bighorn recommends that no Phase II data recovery be conducted.

Surface collections and test excavations of site 42MD2343 resulted in the recovery of a total of 17 artifacts. Nearly the entire assemblage was comprised of debitage, including several utilized flakes; however, a late stage biface and a ground stone fragment were also recovered. No ceramics or faunal material was recovered. The sparse recovery of artifacts and failure to locate any features makes interpretation of this site difficult; however, the material culture recovered from 42MD2343 suggests the site may represents an ephemeral camp, possibly occupied by a mixed gender group, where seed processing and chipped stone tool production occurred. (During Archaic Period)

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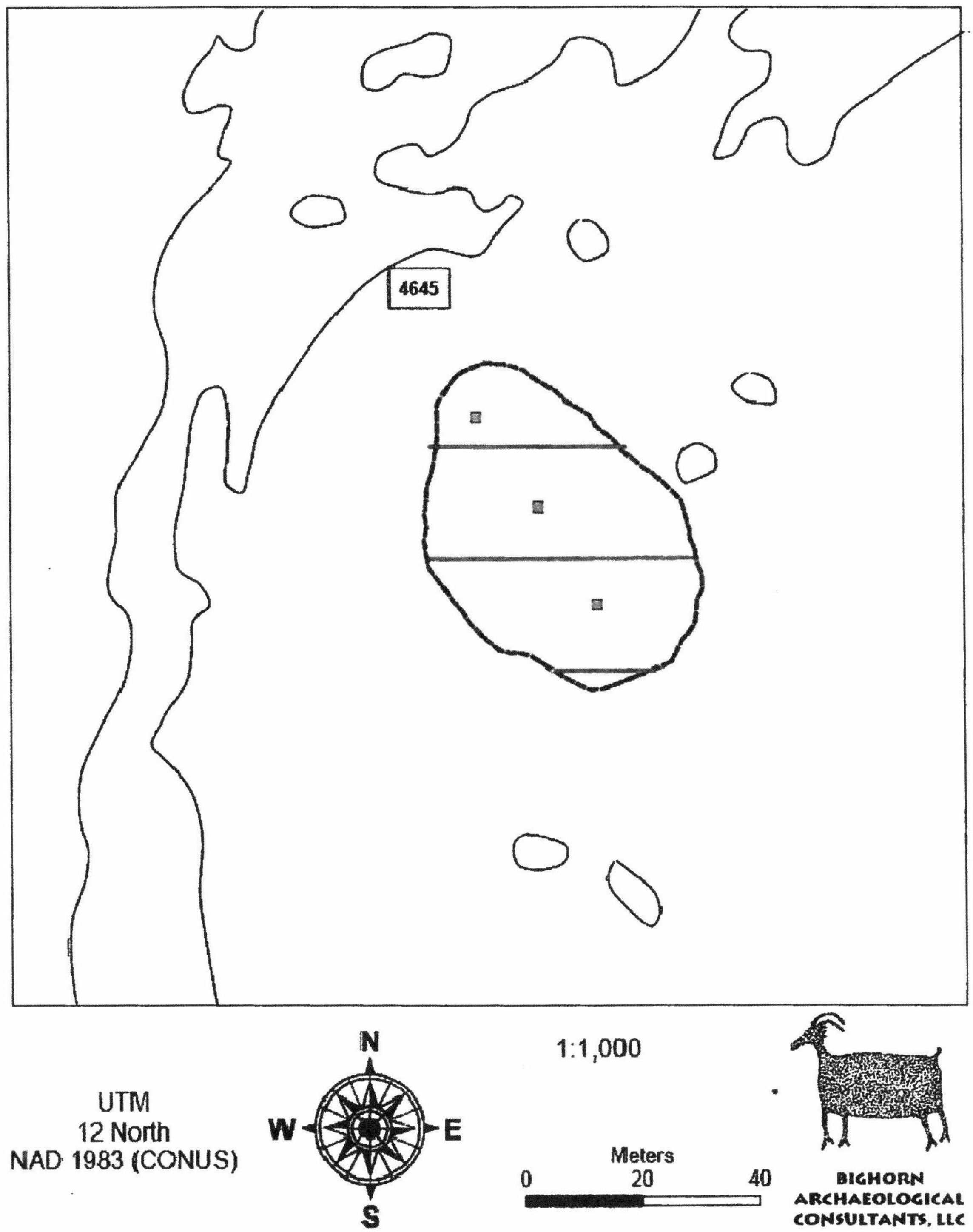
Appendix A
Trenching and Test Unit Location Map



Appendix A. Location of Trenches and Test Units within Site 42MD2343. USGS 7.5' Series Quadrangle: Rain Lake, Utah 1971, T 15S, R 7W

Appendix B
Obsidian Sourcing

Geochemical Research Laboratory Letter Report 2009-55

June 30, 2009

Mr. Dale R. Gourley
Bighorn Archaeological Consultants, LLC
3790 Nicholas Drive
Santa Clara, UT 84765

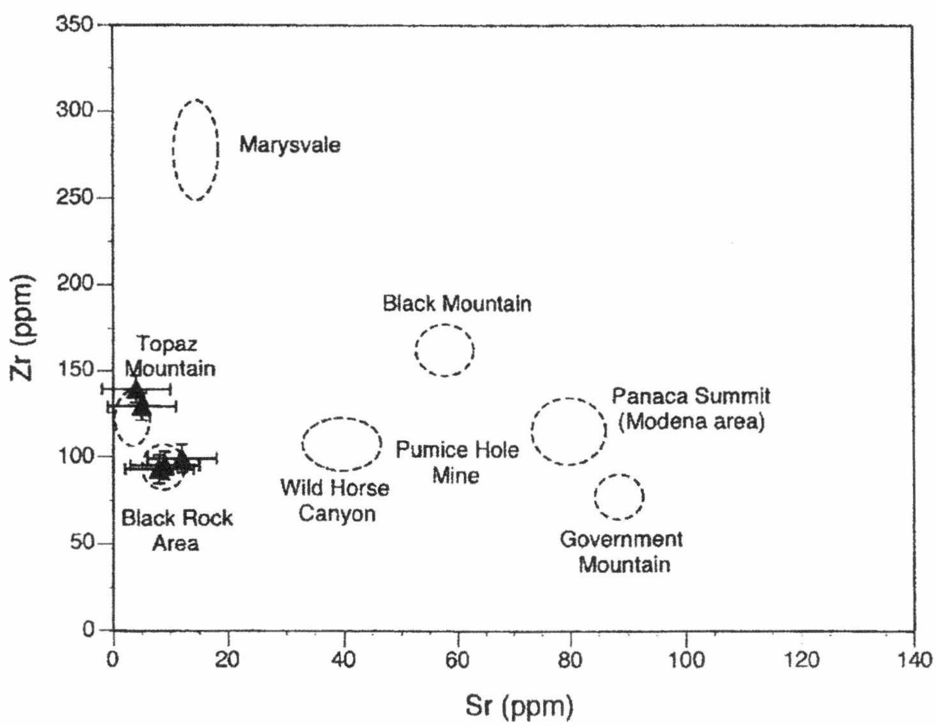
Dear Mr. Gourley:

Enclosed with this letter you will find tables and figures presenting energy dispersive x-ray fluorescence (edxrf) data generated from the analysis of eight obsidian artifacts from archaeological site 42MD2343 located northeast of town of delta in Millard County, Utah. The research reported here was completed pursuant to your letter request of June 24, 2009. Laboratory equipment and instrumentation, and artifact-to-source (geochemical type) attribution procedures (except as indicated), measurement resolution limits for each element, and literature references are the same as reported for sites from the Fort Pearce area (Hughes 2007) and 42SW479 (Hughes 2009).

Five of the specimens you sent were large enough for quantitative analysis (see Table 1 and Figure 1). Trace element data for these specimens indicate that three of them match the trace element profile Black Rock area obsidians, and that two others were made from Topaz Mountain volcanic glass.

Figure 1

Zr vs. Sr Composition for Artifacts from 42MD2343, UT



Dashed lines represent range of variation measured in archaeologically significant geologic obsidian source samples. Filled triangles are plots for artifacts in Table 1. Error bars are two-sigma (95% confidence interval) composition estimates for each artifact.

Table 1

Quantitative Composition Estimates for Obsidian Artifacts from 42MD2343, Utah

Cat. Number	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	$Fe_2O_3^T$	Ratio Fe/Mn	Obsidian Source (Chemical Type)
			Trace Element Concentrations										
FS 3	nm	nm	439 ±4	5 ±3	47 ±3	129 ±4	72 ±3	nm	nm	nm	1.00 ±.02	21	Topaz Mountain
FS 4.4	nm	nm	480 ±4	4 ±3	50 ±3	138 ±4	70 ±3	nm	nm	nm	1.10 ±.02	21	Topaz Mountain
FS 4.6	nm	nm	262 ±4	8 ±3	61 ±3	93 ±4	37 ±3	nm	nm	nm	.95 ±.02	21	Black Rock area
FS. 5.1	nm	nm	279 ±4	12 ±3	60 ±3	99 ±4	33 ±3	nm	nm	nm	1.03 ±.02	23	Black Rock area
FS 6	nm	nm	278 ±4	6 ±3	61 ±3	95 ±4	37 ±3	nm	nm	nm	1.02 ±.02	21	Black Rock area
U.S. Geological Survey Reference Standard													
RGM-1 (measured)	nm	nm	150 ±4	110 ±3	25 ±3	223 ±4	10 ±3	819 ±28	nm	nm	nm	61	Glass Mtn., CA
RGM-1 (recommended)	32	15	149	108	25	219	9	807	1600	279	1.86	nr	Glass Mtn., CA

Values in parts per million (ppm) except total iron [in weight %] and Fe/Mn intensity ratios; ± = two σ expression x-ray counting uncertainty and regression fitting error at 120-240 seconds livetime. nm= not measured. nr= not reported.

Table 2

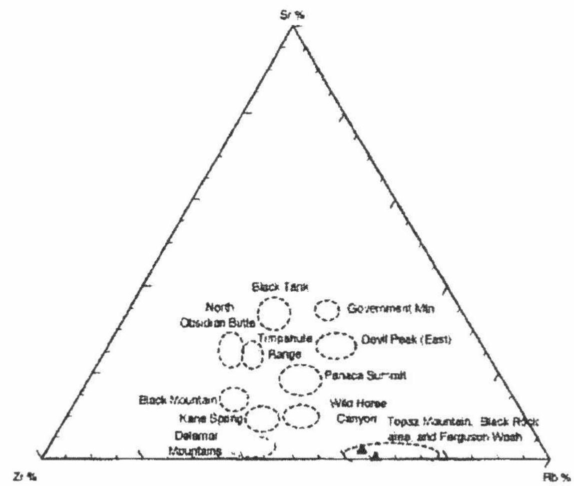
Integrated Net Peak Intensity Element Data for Artifacts from 42MD2343, UT

Cat. no.	Rb	Sr	Zr	Σ Rb,Sr,Zr	Rb%	Sr%	Zr%	Fe/Mn	Rb/Sr	Zr/Y	Y/Nb	Zr/Nb	Sr/Y	Obsidian Source (Chemical Type)
	Element Intensities							**Intensity Ratios**						
FS 1	660	25	380	1065	.620	.024	.356	21.7	26.4	2.0	1.5	2.9	.1	Black Rock area
FS 4.1	1022	9	528	1559	.656	.006	.338	21.5	113.6	3.6	.6	2.0	.1	Topaz Mountain
FS 4.8	670	26	387	1083	.619	.024	357	20.3	25.8	2.1	1.4	2.9	.1	Black Rock area

Integrated net intensities (counts above background) generated at 30 seconds livetime

Figure 2

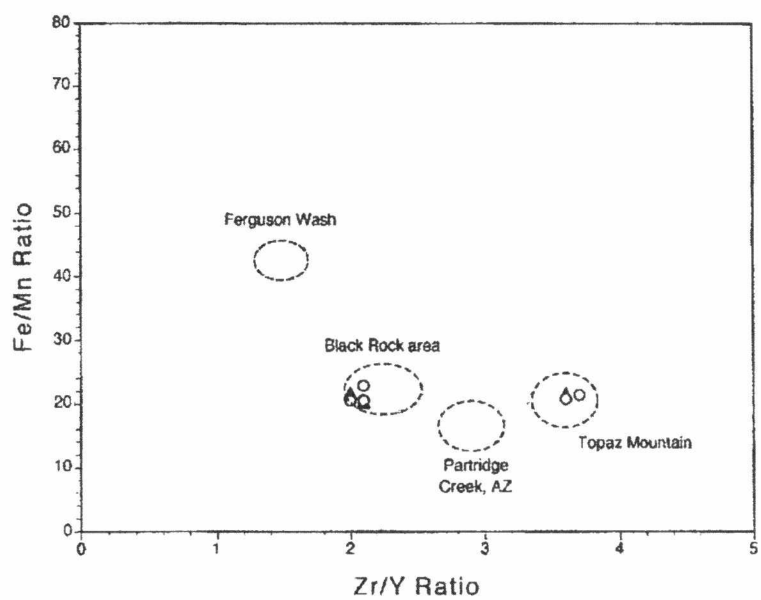
Ternary Diagram Plots for Artifacts from 42MD2343, UT



Dashed lines represent range of variation in archaeologically significant geological obsidian source samples. Filled triangles represent plots for artifacts reported in Table 2.

Figure 3

Fe/Mn vs. Zr/Y Intensity Ratios for Artifacts from 42MD2343, Utah



Dashed lines represent range of variation measured in archaeologically significant geologic obsidian source samples. Filled triangles represent the plots for artifacts from data in Table 2; open circles are plots for artifacts from data in Table 1.

Three of the specimens you submitted from 42MD2343 were too small (i.e. < ca. 9-10 mm diameter) and/or too thin (i.e. < ca. 1.5 mm thick) to generate x-ray counting statistics adequate for proper conversion from background-corrected intensities to quantitative concentration estimates (i.e., ppm) so I analyzed them to generate integrated net intensity (peak count) data for all mid-Z elements (i.e. Rb, Sr, Y, Zr and Nb), then converted these counts to percentages and ratios to facilitate presentation on ternary and bivariate diagrams (see Hughes 2009 for protocol). Integrated net intensity counting data and derived ratios appear in Table 2 and Rb/Sr/Zr percentage values are plotted in Figure 2, showing that the specimens all plot within the Rb/Sr/Zr range of obsidians from Topaz Mountain, Black Rock area and Ferguson Wash. Fe/Mn vs. Zr/Y intensity ratios (see Figure 3) distinguish among these geologic obsidians, showing that two artifacts were made from Black Rock area obsidians and that the other was fashioned from Topaz Mountain glass.

In sum, of eight artifacts analyzed from 42MD2343, five specimens were made from Black Rock area obsidians and three others have the same trace element profile as Topaz Mountain obsidian.

I hope this information will help in your analysis and interpretation of other cultural material from these sites. Please contact me at my laboratory (phone [650] 851-1410, via e-mail: rehughes@silcon.com, or at my web site: www.geochemicalresearch.com) if I can provide any further assistance or information. As you requested, I have forwarded the specimens to Tom Origer for obsidian hydration analysis.

Sincerely,

Richard Hughes

Richard E. Hughes, Ph.D., RPA
Director, Geochemical Research Laboratory

REFERENCES

Hughes, Richard E.

2007 Energy Dispersive X-ray Fluorescence Analysis of Obsidian Artifacts from the Fort Pearce Wash area of Washington County, Southwestern Utah. Geochemical Research Laboratory Letter Report 2007-21 submitted to Jon R. Baxter, Bighorn Archaeological Consultants, April 5, 2007.

2009 Energy Dispersive X-ray Fluorescence Analysis of Obsidian Artifacts from Archaeological Site 42WS479, Located Within the Beaver Mountains of Washington County, Utah. Geochemical Research Laboratory Letter Report 2009-27 submitted to Dale R. Gourley, Bighorn Archaeological Consultants, March 12, 2009.

Appendix C
Obsidian Hydration

ORIGER'S OBSIDIAN LABORATORY
P.O. BOX 1531
ROHNERT PARK, CALIFORNIA 94927
(707) 584-8200, FAX 584-8300
ORIGER@ORIGER.COM

July 13, 2009

Dale R. Gourley
Bighorn Archaeological Consultants, LLC
3790 Nicholas Drive
Santa Clara, Utah 84765

Dear Dale:

I write to report the results of obsidian hydration band analysis of eight specimens from archaeological site 42MD2343, which is located northeast of Delta, Millard County, Utah. This work was completed following source determinations made by Richard Hughes, Geochemical Research Laboratory, who forwarded the specimens to us on your behalf.

Procedures typically used by our lab for preparation of thin sections and measurement of hydration bands are described here. Specimens are examined to find two or more surfaces that will yield edges that will be perpendicular to the microslides when preparation of each thin section is done. Generally, two parallel cuts are made at an appropriate location along the edge of each specimen with a four-inch diameter circular saw blade mounted on a lapidary trimsaw. The cuts result in the isolation of small samples with a thickness of about one millimeter. The samples are removed from the specimens and mounted with Lakeside Cement onto etched glass micro-slides.

The thickness of each sample was reduced by manual grinding with a slurry of #600 silicon carbide abrasive on plate glass. Grinding was completed in two steps. The first grinding is stopped when each sample's thickness is reduced by approximately one-half. This eliminates micro-flake scars created by the saw blade during the cutting process. Each slide is then reheated, which liquefies the Lakeside Cement, and the samples are inverted. The newly exposed surfaces are then ground until proper thickness is attained.

Correct thin section thickness is determined by the "touch" technique. A finger is rubbed across the slide, onto the sample, and the difference (sample thickness) is "felt." The second technique used to arrive at proper thin section thickness is the "transparency" test where the micro-slide is held up to a strong source of light and the translucency of each sample is observed. The samples are reduced enough when it readily allows the passage of light. A cover glass is affixed over each sample when grinding is completed. The slides and paperwork are on file under File No. OOL-450.

The hydration bands are measured with a strainfree 60-power objective and a Bausch and Lomb 12.5-power filar micrometer eyepiece mounted on a Nikon Labophot-Pol polarizing microscope. Hydration band measurements have a range of +/- 0.2 microns due to normal equipment limitations.

Six measurements are taken at several locations along the edge of each thin section, and the mean of the measurements is calculated and listed on the enclosed data page.

All eight specimens were marked by measurable hydration bands. We used the hydration band measurements to calculate dates as described below.

We calculated dates by determining the rate of hydration through comparison to an obsidian with a well-established rate, and then calculating the EHT for the specimens' location. The steps we follow allow us to essentially convert the subject obsidian specimens' hydration band widths into their control source equivalency. We establish what we term "comparison constants." This is done in most cases by using data from laboratory induced hydration. Joseph Michels published a series of reports on the results of induced hydration for a large number of sources, and those reports are often used to establish the comparison constants. More recently, Origer's Obsidian Laboratory has generated additional induced hydration data that is also used.

Next effective hydration temperatures (EHT) differences are taken into account between the control source's EHT and the subject specimens' EHT. EHT values are calculated using temperature data from the website, www.wrcc.dri.edu/summary/climsmut.html. We are able to adjust the subject specimens' hydration band measurements and use them in the standard diffuse formula (Time = kx^2) to arrive at dates. "K" is the hydration rate constant and "x" is the hydration band measurement.

In this case, five specimens derived from obsidian from the Black Rock area and two pieces were from the Topaz Mountain source. Induced hydration data indicates that the development of hydration on Black Rock obsidian is approximately 90% of that for Napa Valley obsidian (the control source) and the development of hydration on Topaz Mountain obsidian is approximately 71% of that for Napa Valley obsidian (see Michels 1984, 1986a, 1986b). Thus, rate adjustments are necessary. The EHT of the control source is 16.3 and the nearest weather stations at similar elevations to the subject site are located at Delta and Oak City, with EHTs of 14.9 and 16.1, respectively. For this report, we'll assume that the archaeological site's EHT is on the order of 15.3 because it is nearer to Delta. Therefore, the site's EHT (estimated at 15.3) is taken to be one degree less than the control site's 16.3, and an adjustment in hydration band measurements will be made.

Because the EHT for site 42MD2343 is approximately one degree less (cooler) than the control location the obsidian specimens developed slightly less hydration than would control source specimens. Therefore we adjust the subject specimens' hydration band measurements upward by 6% per degree difference. Six percent has been found to be an appropriate adjustment based on several studies (Basgall 1990; Origer 1989).

The following table shows any needed measurement adjustments for hydration rate and EHT differences, and dates.

Hydration Laboratory #	Hydration Band (in microns)	Rate Adjusted Hydration Band	EHT Adjusted Hydration Band	Date (in years before present)
1	3.6	4.0	4.2	2,706
2	4.7	6.6	7.0	7,517
3	3.6	5.1	5.4	4,473
4	5.0	7.1	7.5	8,629
5	3.2	3.6	3.8	2,215
6	3.6	4.0	4.2	2,706
7	3.3	3.7	3.9	2,333
8	3.4	3.8	4.0	2,454

These dates suggest that Topaz Mountain obsidian was brought onto the site early while Black Rock obsidian was brought onto the site at a later date and for a narrow range of time.

Please don't hesitate to contact me if you have questions regarding this hydration work.

Sincerely,

Thomas M. Origer
Director

References

Basgall, M

1990 Hydration Dating of Coso Obsidian: Problems and Prospects. Paper presented at the 24th annual meeting of the Society for California Archaeology, Foster City, California.

Michels, J.

1984 Hydration Rate Constants for Topaz Mountain Obsidian, Utah. Mohlab Technical Report No. 34. State College, Pennsylvania.

1986a Hydration Rate Constants for Black Rock Obsidian, Millard County, Utah. Mohlab Technical Report No. 65. State College, Pennsylvania.

1986b Hydration Rate Constants for Napa Glass Mountain Obsidian, Napa County, California. Mohlab Technical Report No. 14. State College, Pennsylvania.

Origer, T.

1989 Hydration Analysis of Obsidian Flakes Produced by Ishi During the Historic Period. Current Directions in California Obsidian Studies. Contributions of the University of California Archaeological Research Facility. Number 48. Berkeley, California.

Submitter: D. Gourley - Bighorn Archaeological Consultants July 2009

	Lab#	Sample#	Description	Unit	Depth	Remarks	Measurements	Mean	Source*
42MD2343									
	1	FS1	Debitage	Test Pit 1	10-20	None	3.4 3.5 3.6 3.6 3.6 3.6	3.6	BR Area
	2	FS3	Biface		Surface	Weathered	4.5 4.5 4.6 4.7 4.8 4.9	4.7	TMtn
	3	FS4.1	Debitage		Surface	None	3.6 3.6 3.6 3.6 3.6 3.7	3.6	TMtn
	4	FS4.4	Debitage		Surface	None	4.8 4.9 4.9 5.0 5.1 5.1	5.0	TMtn
	5	FS4.6	Debitage		Surface	None	3.1 3.2 3.2 3.3 3.3 3.3	3.2	BR Area
	6	FS4.8	Debitage		Surface	None	3.5 3.5 3.5 3.6 3.6 3.6	3.6	BR Area
	7	FS5.1	Debitage	Test Pit 3	10-20	None	3.2 3.2 3.2 3.3 3.4 3.6	3.3	BR Area
	8	FS6	Debitage	Test Pit 3	0-5	None	3.4 3.4 3.4 3.4 3.4 3.5	3.4	BR Area

Lab Accession No: OOL-450 Technician: Thomas M. Origer

*Specimens were XRF sourced

BR Area = Black Rock Area
TMtn = Topaz Mountain

Appendix C.

INTERMOUNTAIN POWER SERVICE CORPORATION

November 4, 2015

Mr. Scott Anderson, Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, UT
84114-4880

Dear Mr. Anderson,

<u>Coal Combustion Residual Fugitive Dust Control Plan Notification</u>

Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the Coal Combustion Residual (CCR) Fugitive Dust Control Plan for the Intermountain Generating Station as specified under 40 CFR 257.105(g)(1).

The initial CCR Fugitive Dust Control Plan was signed on October 14, 2015 and was placed in the CCR Operating Record on October 19, 2015. It was uploaded to IPSC's website on November 4, 2015 and is available to view on IPSC's website at www.ipsc.com.

Should you have any questions or comments, please contact Mr. Lynn Banks at (435) 864-6496, or by email at lynn.banks@ipsc.com.

Cordially,

Wes Bloomfield for JAF

Jon A. Finlinson
President and Chief Operations Officer

LPB/BP:he

cc: Hamid V. Nejad
Saif Mogri

COAL COMBUSTION RESIDUAL (CCR)

FUGITIVE DUST CONTROL PLAN

INTERMOUNTAIN GENERATING STATION

850 West Brush Wellman Road

Delta, UT 84624

October 19, 2015

COAL COMBUSTION RESIDUAL FUGITIVE DUST CONTROL PLAN

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COAL COMBUSTION RESIDUAL FUGITIVE DUST CONTROL PLAN

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LIST OF ACRONYMS

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CFR	Code of Federal Regulations
FGD	Flue Gas Desulfurization
IGS	Intermountain Generating Station
SI	Surface Impoundment

COAL COMBUSTION RESIDUAL FUGITIVE DUST CONTROL PLAN

SECTION 1

BACKGROUND

The purpose of this Plan is to identify and describe the Coal Combustion Residuals (CCR) fugitive dust control procedures used to reduce the potential for CCR becoming airborne at the Facility. The following sections provide background information on (1) coal combustion residuals and (2) regulatory requirements.

1.1 Coal Combustion Residuals

CCR materials are produced at the Intermountain Generating Station (IGS) when coal is burned to produce electricity. All CCR materials are managed on site, including on-site storage, processing (such as dewatering), and final disposal. Types of CCRs typically generated include fly ash, bottom ash, and flue gas desulfurization (FGD) materials. General characteristics of these CCR materials are described below.

- Fly Ash – Fly ash is captured from exhaust (flue) gases by baghouses at the IGS. Fly ash is characterized by clay-sized and silt-sized fine grain materials, consisting of silica, calcium, alumina, iron, and trace heavy metals. Due to the small particle size and consistency, fly ash can often be mobilized by windy conditions when it is dry. However, Class C fly ash, which is generated at IGS, has self-cementing properties in the presence of water. For this reason, a crust generally forms on its surfaces, reducing the potential for dust issues from Class C fly ash storage areas.

- FGD Materials – FGD materials are produced by FGD emissions control systems, which are designed and operated to remove sulfur dioxide (SO_2) from exhaust (flue) gases. FGD materials are produced as a wet sludge, which is then dewatered and mixed with fly ash. FGD materials can form a crust on surfaces reducing potential for dust issues from FGD storage areas.

- Bottom Ash – Bottom ash is characterized by sand-sized and gravel-sized materials, which settle by gravity to the bottom of a coal-fired furnace. Under certain conditions, such as differential settling in a surface impoundment, the smaller-grained materials can be concentrated at the surface and be a potential source of dust issues.

1.2 Regulatory Requirements

This Fugitive Dust Control Plan has been developed for the IGS Facility in accordance with applicable federal regulations discussed below.

1.2.1 CCR Rule Requirements

The CCR Rule (40 Code of Federal Regulations [CFR] Part 257, Subpart D) requires preparation of a Fugitive Dust Control Plan for facilities including CCR landfills, CCR surface impoundments, and any lateral expansion of a CCR unit. Definitions from the CCR Rule are provided below.

CCR fugitive dust means solid airborne particulate matter that contains or is derived from CCR, emitted from any source other than a stack or chimney.

CCR landfill means an area of land or an excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR surface impoundment means a natural topographic depression, manmade excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.

CCR unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified. The CCR Rule requires owners or operators of these CCR facilities to adopt and document "measures that will effectively reduce the potential for CCR becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management, and material handling activities" (40 CFR 257.80). Existing CCR surface impoundments and existing CCR landfills must prepare a Fugitive Dust Control Plan "no later than October 19, 2015, or by initial receipt of CCR in any CCR unit at the facility if the owner or operator becomes subject to this subpart after October 19, 2015" (40 CFR 257.80 (b)(5)).

COAL COMBUSTION RESIDUAL FUGITIVE DUST CONTROL PLAN

SECTION 2

FACILITY INFORMATION

Name of Facility:	Intermountain Generating Station
Location:	Latitude 39.507290 Longitude -112.573390
Name of Operator:	Intermountain Power Service Corporation
Operator Mailing Address:	850 West Brush Wellman Road
	Delta, UT 84624
Name of Owner:	Intermountain Power Agency
Owner Mailing Address:	10653 S River Front Pkwy # 120
	South Jordan, UT 84095

Facility Description

The IGS is located in Millard County, Utah, approximately 12 miles north of the city of Delta and consists of two identical 950 MWG Generating Units. Both Units have emission controls for particulate and sulfur oxides. The flue gases, leaving the boiler, pass through a fabric filter baghouse and a FGD scrubber. After passing through the scrubber, the wet flue gases are discharged into the atmosphere through a fiberglass liner.

There are three sources of CCR materials, fly ash from the baghouses, blow down from the FGD scrubber, and bottom ash from the boilers.

Fly ash is collected in the baghouses and pneumatically transferred to the Sludge Conditioning Building where it is stored in silos. Blow down from the scrubbers is pumped to the Sludge Conditioning Building where it is dewatered and the solids are mixed with fly ash. The ash and conditioned sludge mixture is then transported by belt to a stackout area where it is then transported to the adjacent Combustion By Products Landfill. Liquids from the dewatering process are sent to the Waste Water Basin, where the remaining solids are allowed to settle out. The water is then reused.

Bottom ash from the boilers is sluiced from the boilers to the three Bottom Ash Basins for disposal. The bottom ash is settled out and the water is returned to the bottom ash system. CCR materials and water from the boiler area sump are also sluiced to the Bottom Ash Basin.

CCR materials were placed into the impoundments and landfill starting in 1986.

SECTION 3

DUST CONTROL PROCEDURES

The following sections discuss dust control procedures for:

- CCR short-term storage and management areas.
- CCR surface impoundment units.
  - Intermountain Power Bottom Ash Basin (UT00463).
  - Intermountain Power Waste Water Basin (UT00468).
- CCR landfill unit.
  - Intermountain Power Combustion By-Products Landfill.
- Facility roads.

3.1 CCR Short-Term Storage and Management Areas

Short-Term Storage Areas for CCR materials at the IGS are temporary dumpsters, sludge emergency stackout, and combustion by-products landfill stackout.

- Temporary dumpsters will be located at the scrubber, baghouse, generation building, and other locations when activities require the handling and removal of CCR materials.
- CCR materials at the Sludge Emergency Stackout and the combustion by-products landfill stackout will be removed and transported to the active face of the combustion by-products landfill, or ash pond for disposal as soon as practical. This conditioned sludge is not prone to dusting.
- During loading and unloading activities, drop height is kept low to reduce the potential for mobilization of CCR dust. During high wind conditions, loading and management operations may be reduced or halted.
- CCR materials that are collected from maintenance activities are placed on the working face of the landfill or in the ash basin.
- CCR materials on the ground due to maintenance activities on the CCR handling, transfer equipment, piping, conveyor systems, or breakdowns will be cleaned up as soon as practical.
- Water spray will be applied, as needed, to CCR material short-term storage and handling activities.
- Conveyor systems are covered on two and one half sides to minimize dusting issues.

3.2 CCR Surface Impoundment Units

Bottom ash for the generating units is stored in the Bottom Ash Basin SI. Since the CCR is stored as a slurry mixture with high water content, and the wetted CCR pond surface is present at a lower elevation than its surroundings and would not cause dusting. However, as the SI is filled, the CCR is placed above the water level and based on these conditions CCR can become airborne during storage in the CCR SI.

An encrusting and encapsulating agent may be applied as needed to the CCR material that is above the water level of the basin. If dry dusty areas are observed on the CCR SI, a water spray will be applied as needed, and/or activity may be suspended.

CCR materials in the Waste Water Basin have high moisture content and would not cause a dusting problem. If a dusting condition is identified on the Waste Water Basin, these areas will be sprayed with water as needed.

3.3 CCR Landfill Unit

In accordance with 40 CFR 257.80(a), CCR will be conditioned and placed into the Combustion By-Products Landfill. A water spray will be added to CCR materials on the working face of the landfill to reduce any wind dispersal and improve compaction during CCR.

Additional dust control procedures are implemented for active CCR landfill units, as discussed below.

- The active landfill cell area and the working face will be maintained as small as feasible.
- During loading and unloading activities, drop height will be minimized to control mobilization of CCR dust. Water spray will be used as needed during loading and unloading.
- Water spray or chemical dust suppressant is applied, as needed to the exposed CCR materials, including on the working face.
- During high wind conditions, unloading operations at the working face may be reduced or halted.

When active CCR operations are completed in a given area, they are contoured as needed to reduce the slopes of any exposed CCR and a final cap is put in place.

Following the installation, the final cap and cover are maintained to reduce the potential for CCR becoming exposed. An encrusting and encapsulating agent may be applied as needed.

3.4 Facility Roads

Dust control procedures for roads in active use for CCR management activities at the Facility, or that are being traveled by equipment employed in CCR management activities, are discussed below.

- Speed limits are posted to reduce dust mobilization. During high wind conditions, operations and related traffic may be reduced or halted.
- During transportation, water may be added to CCR prior to transportation.
- A solution of magnesium chloride or equivalent product will be applied to unpaved roads where applicable. Figure 1 illustrates the unpaved roads that are sprayed with magnesium chloride.
- Water sprays will be used on CCR unpaved roads at the Facility, and can be sprayed multiple times per day using water wagons. Figure 1 illustrates unpaved roads that are routinely watered; as activities progress at the Facility, these locations may change.
- Paved roads used to transport CCR materials at the Facility will be sprayed with water, as needed by water trucks. Figure 1 illustrates the paved roads that may be used to transport CCR. As activities progress at the Facility, these locations may change.

SECTION 4

INSPECTIONS

Visual inspections are conducted by site personnel to observe signs of inadequate dust control. Appendix A provides the CCR Seven Day Inspection Form. Documentation of any inspections noting non-conforming items, are maintained in the Facility Operating Record.

Monitoring of the CCR landfill, surface impoundments, short term storage, management areas, and facility roads will be conducted per 4.1 below.

4.1 Monitoring Method

Indicators that fugitive dust is being minimized may include:

- Visible fugitive dust does not extend beyond the extent of access roads right-of-way.
- Visible fugitive dust does not extend past the downwind Facility boundaries.
- Visible fugitive dust does not extend beyond the extent of the surface impoundment area.
- Visible fugitive dust does not extend beyond the extent of the storage area.

4.2 Control Measures

Plant personnel will insure that the appropriate levels of control measures are taken to meet the visual monitoring indicators as needed.

Control measures for each CCR area are listed below.

Combustion By-Products Landfill	Control Level	Control Measure
	1	No Action
	2	Compact as needed
	3	Apply water with water truck
	4	Apply more water to hot spots
	5	Reduce equipment speed
	6	Reduce or suspend activities

CCR Short Term Storage and Management Areas	Control Level	Control Measure
	1	No Action
	2	Increase moisture in mixture
	3	Apply water with water truck
	4	Spray the pile while loading

CCR Surface Impoundments	Control Level	Control Measure
	1	No Action
	2	Apply water with water truck
	3	Reduce or suspend activities

CCR Roads	Control Level	Control Measure
	1	No Action
	2	Apply water with water truck
	3	Reduce vehicle speed

Control measures may be increased or decreased to reflect current conditions and activities. Some levels of control may not be used if a higher level is deemed necessary. If the fugitive dust observation meets the monitoring indicator, the control level may be maintained at its current level or may be relaxed to the next less stringent level if monitoring indicators are not likely to be exceeded.

SECTION 5

TRAINING

Training will be conducted annually to update qualified employees on changes in the regulations, laws, or in-house procedures related to CCR management, including dust control procedures. Training records will be maintained at the Facility for five years. Sign-in sheets and topics of discussion at each briefing are maintained for documentation.

SECTION 6

RECORDKEEPING AND REPORTING

The following sections provide details regarding (1) plan preparation, (2) community involvement, (3) annual reporting, and (4) Fugitive Dust Control Plan assessment and update process.

6.1 Plan Preparation

In accordance with 40 CFR 257.80(a), 257.105(g), and 257.107(g), a complete, updated copy of this Fugitive Dust Control Plan is maintained in the Facility operating record and on the IGS publicly accessible internet site www.ipsc.com.

In accordance with 40 CFR 257.106(g), the Director of the Utah Division of Waste Management and Radiation Control is notified when this Fugitive Dust Control Plan, or any subsequent amended version, is placed in the Facility operating record and on the IGS internet site.

6.2 Community Involvement

As discussed above, IGS maintains a publicly accessible internet site (www.ipsc.com) to provide information to stakeholders. The IGS internet site also provides contact information and requests that stakeholders contact IGS with any questions, concerns, or complaints regarding dust controls at the Facility.

In accordance with 40 CFR 257.80(b), IGS will maintain records of stakeholder correspondence, including any questions or concerns regarding dust controls at the Facility.

6.3 Annual Reporting

In accordance with 40 CFR 257.80(c), IGS prepares annual dust control reporting to document the following information:

- Description of dust control procedures implemented at the following CCR Units:
  - Combustion By-Products Landfill.
  - Bottom Ash Basin.
  - Waste Water Basin.
  - CCR short-term storage and management areas.
  - Summary of any questions of concerns raised by stakeholders.
  - Description of any corrective actions taken.

Appendix B provides a template for the Annual Dust Control Report.

The first Annual Dust Control Report will be completed on or before December 19, 2016. Subsequent Annual Dust Control Reports will be completed by December 19 of each calendar year thereafter. Each Annual Dust Control Report is completed and placed in the Facility operating record and on the IGS internet site, as required by 40 CFR 257.80(c), 257.105(g), and 257.107(g), within the timeframes above. In accordance with 40 CFR 257.106(g), the Director of the Utah Division of Waste Management and Radiation Control is notified when each Annual Dust Control Report has been placed in the Facility operating record and on the IGS internet site.

6.4 Plan Assessment and Update Process

In accordance with 40 CFR 257.80(b), IGS periodically assesses the effectiveness of this Fugitive Dust Control Plan. The Fugitive Dust Control Plan is reviewed at least once five years from the date of the last review for adherence to the requirements of 40 CFR 257. If more effective prevention and control technology has been field-proven at the time of the review and will significantly improve dust controls, the Fugitive Dust Control Plan will be amended to reflect changes. As required by 40 CFR 257.80(b), technical changes made to this Fugitive Dust Control Plan must be certified by a Professional Engineer. Appendix C provides a template for the Fugitive Dust Control Plan Review Documentation.

In accordance with 40 CFR 257.80(b), IGS will also amend this Fugitive whenever there is a change in conditions that would substantially affect the written Fugitive Dust Control Plan in effect, such as the construction and operation of a new CCR unit. The amended Fugitive Dust Control Plan will be implemented before or concurrently with the initial receipt of CCR into any new CCR unit(s). As required by 40 CFR 257.80(b), technical changes made to this Fugitive Dust Control Plan must be certified by a Professional Engineer.

In accordance with 40 CFR 257.106(g), the Director of the Utah Division of Waste Management and Radiation Control will be notified when this Fugitive Dust Control Plan has been amended and placed in the Facility operating record and on the IGS internet site.

SECTION 7

MANAGEMENT APPROVAL

This statement is the written commitment of management to provide the resources required to effectively reduce the potential for CCR becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities. This Dust Control Plan will be fully implemented as herein described, and the Dust Control Plan will be maintained in the Facility's operating record and on the IGS publicly accessible internet site www.ipsc.com.

Name: Jon Finlinson | Date

Title: President and Chief Operation Officer

Oct 12, 2015

Date of full implementation: October 19, 2015

Management Initials:

SECTION 8

ENGINEERING CERTIFICATION

Pursuant to 40 CFR 257.80 and by means of this certification I attest that:

(i) I am familiar with the requirements of the CCR rule (40 CFR 257);

(ii) I, or my agent, have visited and examined the Site;

(iii) the Fugitive Dust Control Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of the CCR rule; and

(iv) the Fugitive Dust Control Plan meets the requirements of 40 CFR 257.80.

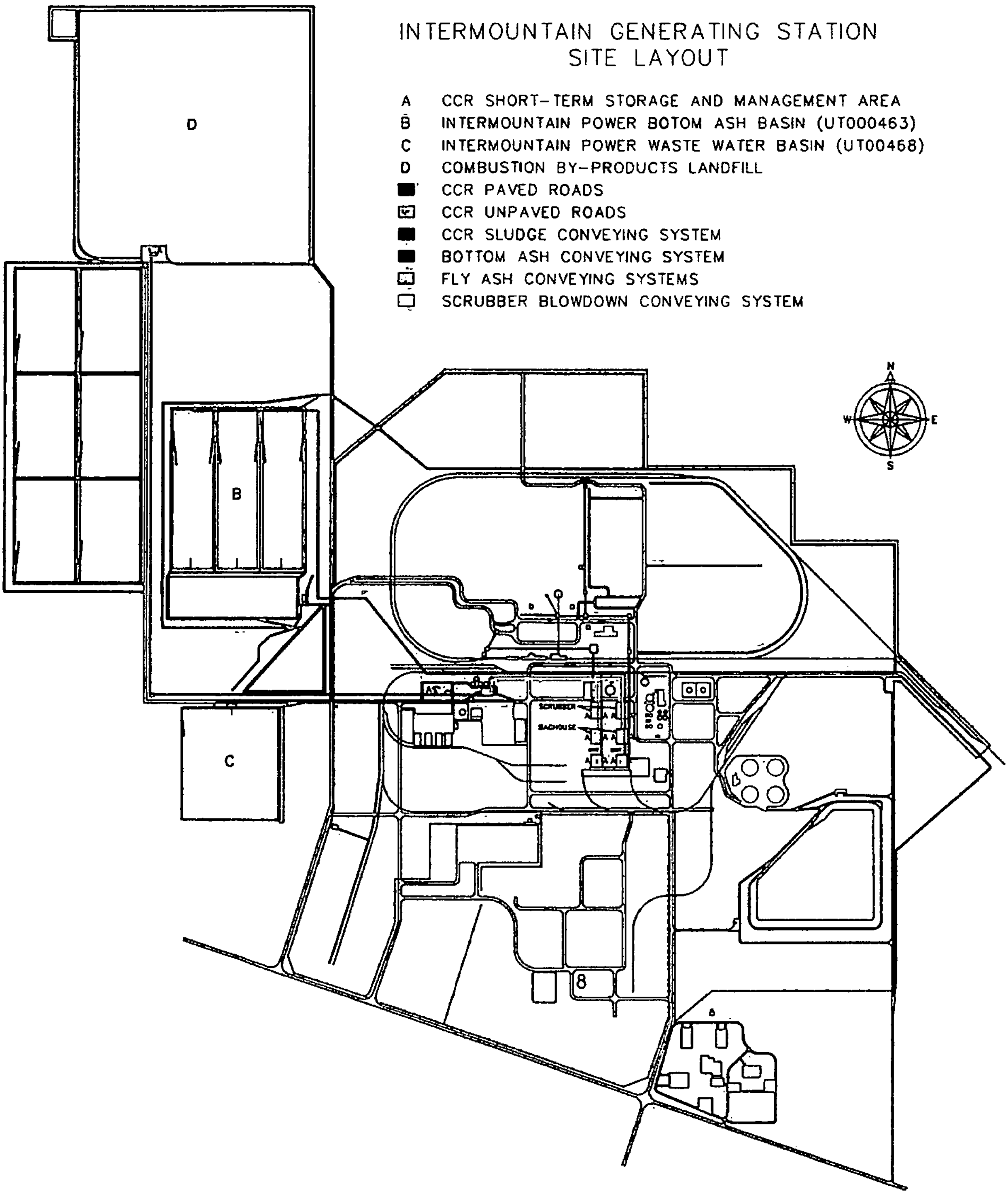
Hyrum Blaine Ipson
Printed Name of Registered Professional Engineer

[signature]
Signature of Registered Professional Engineer

Registration No. 168299-2202 State: Utah

LICENSED PROFESSIONAL ENGINEER
No. 168299-2202
HYRUM BLAINE IPSON
Date 10-14-15
STATE OF UTAH

FIGURE 1


INTERMOUNTAIN GENERATING STATION
SITE LAYOUT
A CCR SHORT-TERM STORAGE AND MANAGEMENT AREA
B INTERMOUNTAIN POWER BOTOM ASH BASIN (UT000463)
C INTERMOUNTAIN POWER WASTE WATER BASIN (UT00468)
D COMBUSTION BY-PRODUCTS LANDFILL
CCR PAVED ROADS
CCR UNPAVED ROADS
CCR SLUDGE CONVEYING SYSTEM
BOTTOM ASH CONVEYING SYSTEM
FLY ASH CONVEYING SYSTEMS
SCRUBBER BLOWDOWN CONVEYING SYSTEM
D
B
C
SCRUBBER
BAGHOUSE
N
W
E
S
8

APPENDIX A CCR Seven Day Inspection Form

CCR SEVEN DAY INSPECTION FORM

Name:______________________________

Date:______________________________

Intermountain Power Bottom Ash Basin (UT00463)		
Inspection Item*	Check	Remarks (size, location, etc.)
Excessive, turbid, or sediment-laden seepage	Yes ☐ No ☐	
Piping or other internal erosion	Yes ☐ No ☐	
Transverse, longitudinal, and desiccation cracking (crest/embankment)	Yes ☐ No ☐	
Slides, bulges, boils, sloughs, scarps, sinkholes, or depressions	Yes ☐ No ☐	
Abnormally high or low pool levels	Yes ☐ No ☐	
Animal burrows	Yes ☐ No ☐	
Excessive or lacking vegetative cover	Yes ☐ No ☐	
Slope erosion	Yes ☐ No ☐	
Debris (around intake or outflow structures)	Yes ☐ No ☐	
Abnormal discoloration, flow, or discharge of debris or sediment at outlets	Yes ☐ No ☐	
Is Dust Control required	Yes ☐ No ☐	

Intermountain Power Waste Water Basin (UT00468)		
Inspection Item*	Check	Remarks (size, location, etc.)
Excessive, turbid, or sediment-laden seepage	Yes ☐ No ☐	
Piping or other internal erosion	Yes ☐ No ☐	
Transverse, longitudinal, and desiccation cracking (crest/embankment)	Yes ☐ No ☐	
Slides, bulges, boils, sloughs, scarps, sinkholes, or depressions	Yes ☐ No ☐	
Abnormally high or low pool levels	Yes ☐ No ☐	
Animal burrows	Yes ☐ No ☐	
Excessive or lacking vegetative cover	Yes ☐ No ☐	
Slope erosion	Yes ☐ No ☐	
Debris (around intake or outflow structures)	Yes ☐ No ☐	
Abnormal discoloration, flow, or discharge of debris or sediment at outlets	Yes ☐ No ☐	
Is Dust Control required	Yes ☐ No ☐	

Intermountain Power Combustion By-Products Landfill		
Inspection Item**	Check	Remarks (size, location, etc.)
Proper placement of the waste	Yes ☐ No ☐	
Slope stability and erosion control	Yes ☐ No ☐	
Surface water percolation minimized (i.e. ponding minimized)	Yes ☐ No ☐	
Liner and leachate collection systems properly operated and maintained	Not Applicable	
Water quality monitoring systems maintained and operating	Yes ☐ No ☐	
Dust controlled	Yes ☐ No ☐	
Run-On and Run-Off controls	Yes ☐ No ☐	
Plan in place to address and correct problem(s)	Yes ☐ No ☐	

APPENDIX B **Annual Dust Control Report**

Annual Dust Control Report

Intermountain Generating Station

Date ______________________

Introduction

In accordance with 40 CFR 257.80(c), IGS has prepared this Annual Dust Control Report to document the following information for the IGS Facility located near Delta, Utah:

- Description of dust control procedures implemented at:
  - Intermountain Power Bottom Ash Basin (UT00463).
  - Intermountain Power Waste Water Basin (UT00468).
  - Intermountain Power Combustion By-Products Landfill.
- Summary of any questions or concerns raised by stakeholders.
- Description of any corrective actions taken.

Implementation of Dust Control Procedures

During the last 12 months, dust control procedures have been implemented at [list CCR units], as discussed in the Fugitive Dust Control Plan, dated October 19, 2015. A copy of the current Fugitive Dust Control Plan is available in the Facility operating record and on the IGS internet site, as required by 40 CFR 257.105(g) and 257.107(g).

Stakeholder Correspondence

During the last 12 months, the following concerns or complaints have been received by IGS:

- [insert, or state that no concerns or complaints were received]
-

For each correspondence item, follow-up communications were completed, and records have been maintained by IGS. If needed, corrective actions have been implemented as discussed below.

Corrective Actions

Based on inspections and/or stakeholder correspondence during the last 12 months, the corrective actions [have/have not] been identified to improve dust control at IGS. A summary of corrective actions, including completion date or status, is provided below.

-
-

Closing

A copy of the most recent Annual Dust Control Report is available in the Facility operating record and on the IGS internet site, as required by 40 CFR 257.105(g) and 257.107(g). The IGS internet site also provides contact information and requests that stakeholders contact IGS with any questions or concerns regarding dust controls at the Facility.

APPENDIX C Fugitive Dust Control Plan Review Documentation

Fugitive Dust Control Plan Review Documentation

In accordance with 40 CFR 257.80(b), this Fugitive Dust Control Plan has been reviewed to assess if more effective control procedures are available to significantly reduce the likelihood of CCR from becoming airborne at the facility.

By means of this certification, I attest that I have completed a review and evaluation of this Plan for the Facility located near Delta, Utah, and as a result

Will

Will Not

amend the Plan. Technical amendments to the Plan have been certified by a Professional Engineer.

Signature, Authorized Facility Representative Date

Name (Printed)

Title

Appendix D.

CCR SEVEN DAY INSPECTION FORM

Name:_______________

Date:_______________

Intermountain Power Bottom Ash Basin (UT00463)		
Inspection Item*	Check	Remarks (size, location, etc.)
Excessive, turbid or sediment-laden seepage	Yes ☐ No ☐	
Piping or other internal erosion	Yes ☐ No ☐	
Transverse, longitudinal, and desiccation cracking (crest/embankment)	Yes ☐ No ☐	
Slides, bulges, boils, sloughs, scarps, sinkholes, or depressions	Yes ☐ No ☐	
Abnormally high or low pool levels	Yes ☐ No ☐	
Animal burrows	Yes ☐ No ☐	
Excessive or lacking vegetative cover	Yes ☐ No ☐	
Slope erosion	Yes ☐ No ☐	
Debris (around intake or outflow structures)	Yes ☐ No ☐	
Abnormal discoloration, flow, or discharge of debris or sediment at outlets	Yes ☐ No ☐	
Is Dust Control required	Yes ☐ No ☐	

Intermountain Power Waste Water Basin (UT00468)		
Inspection Item*	Check	Remarks (size, location, etc.)
Excessive, turbid or sediment-laden seepage	Yes ☐ No ☐	
Piping or other internal erosion	Yes ☐ No ☐	
Transverse, longitudinal, and desiccation cracking (crest/embankment)	Yes ☐ No ☐	
Slides, bulges, boils, sloughs, scarps, sinkholes, or depressions	Yes ☐ No ☐	
Abnormally high or low pool levels	Yes ☐ No ☐	
Animal burrows	Yes ☐ No ☐	
Excessive or lacking vegetative cover	Yes ☐ No ☐	
Slope erosion	Yes ☐ No ☐	
Debris (around intake or outflow structures)	Yes ☐ No ☐	
Abnormal discoloration, flow, or discharge of debris or sediment at outlets	Yes ☐ No ☐	
Is Dust Control required	Yes ☐ No ☐	

Intermountain Power Combustion By-Products Landfill		
Inspection Item**	Check	Remarks (size, location, etc.)
Proper placement of the waste	Yes ☐ No ☐	
Slope stability and erosion control	Yes ☐ No ☐	
Surface water percolation minimized (i.e. ponding minimized)	Yes ☐ No ☐	
Liner and leachate collection systems properly operated and maintained	Not Applicable	
Water quality monitoring systems maintained and operating	Yes ☐ No ☐	
Dust controlled	Yes ☐ No ☐	
Run-On and Run-Off controls	Yes ☐ No ☐	
Plan in place to address and correct problem(s)	Yes ☐ No ☐	

*40 CFR §257.83 (Preamble Page 21394)

**40 CFR §257.84 (Preamble Page 21396)

Appendix E.

INTERMOUNTAIN POWER SERVICE CORPORATION

August 30, 2016

Mr. Scott Anderson, Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, UT
84114-4880

Dear Mr. Anderson,

Coal Combustion Residual Rule Notifications

As per 40 CFR 257.106(h)(2) and Subsection R315-319-106(h)(2), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the groundwater monitoring system certification specified under 40 CFR 257.105(h)(3) and Subsection R315-319-105(h)(3). The groundwater monitoring system certification is contained in the Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report that has been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

As per 40 CFR 257.106(g)(5), 40 CFR 257.106(g)(7), Subsection R315-319-106(g)(5), and Subsection R315-319-106(g)(7), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the periodic inspection reports specified under 40 CFR 257.105(g)(6), 40 CFR 257.105(g)(9), Subsection R315-319-105(g)(6), and Subsection R315-319-105(g)(9). Individual reports for the Intermountain Power Combustion By-products Landfill, the Intermountain Power Bottom Ash Basin (UT00463), and the Intermountain Power Waste Water Basin (UT00468) each titled Initial Annual Inspection Report have been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

If you have any questions or comments, please contact Mr. Mike Utley at (435) 864-6489, or by email at mike.utley@ipsc.com.

Cordially,

Jon A. Finlinson
President and Chief Operations Officer

MU/HBI:he

cc: Bradford L. Packer
Kevin Peng

Initial Annual Inspection Report

Intermountain Power
Combustion By-Products CCR Landfill

January 18, 2016

Table of Contents

1.0 Introduction

On April 17, 2015 the EPA published its final rule in the Federal Register to regulate disposal of coal combustion residuals (CCR) as a solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The effective date of this final rule was October 19, 2015. This final rule established several requirements for existing and new CCR landfills and existing and new CCR surface impoundments. Among them was the requirement to have a qualified professional engineer conduct annual inspections and prepare annual reports on each of the CCR units, with the initial annual inspection and report due no later than January 18, 2016. The requirements for the annual inspections and reports for CCR landfill(s) are outlined in §257.84(b).

The Intermountain Power Project (IPP) is located in Millard County Utah. The IPP is owned by Intermountain Power Agency (IPA) and operated locally by Intermountain Power Service Corporation (IPSC). IPP has one CCR landfill. This landfill's name is "Intermountain Power Combustion By-Products Landfill".

The purpose of this report is to document the annual inspection and annual report on the IPP's CCR landfill. This is the first or initial annual report done on this CCR landfill since the rule went into effect on October 19, 2015. This report covers the period of time from October 19, 2015 until the date of this report.

2.0 Annual Inspection

2.1 Requirements for the Annual Inspection

In accordance with §257.84(b)(1), the annual inspection must include a review of available information regarding the status and condition of the CCR unit, including but not limited to, files available in the operating record such as the results or findings of inspections by a qualified person and the results or findings of previous annual inspections; and a visual inspection of the CCR unit and appurtenant structures to identify signs of distress or malfunction.

2.2 Findings of Initial Annual Inspection

The initial annual inspection on the CCR landfill was performed by Hyrum Blaine Ipson who is a licensed professional engineer in the State of Utah. A copy of the inspection checklist used for the inspection is included in this annual inspection report. The annual inspection included a review of the weekly inspections, a review of previous annual inspections, and a visual inspection of the CCR unit.

2.2.1 Review of Operating Record

The rule requires that inspections be done on CCR units by a "qualified person" at intervals not to exceed seven days, and that the results of these inspections be put into the operating record. For the purposes of this annual inspection report, these inspections will be called "weekly inspections". These weekly inspections should look for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. This would include inspecting for (1) proper placement of the waste; (2) slope stability and erosion control; (3) surface water percolation minimized (i.e. reduce ponding); (4) liner systems and leachate collection system properly operated and maintained where applicable; water quality monitoring systems are maintained and operating; (6) dust is controlled; and (7) a plan is in place to promptly address and correct problems and deficiencies discovered during the inspection.

A review of the operating record was done as part of this annual inspection. This review showed that the required weekly inspections as outlined above were done at least once every seven days as required since the rule went into effect on October 17, 2015. The first weekly inspection on this CCR unit was conducted on October 21, 2015. Subsequent weekly inspections have since been done on this CCR unit at intervals not exceeding seven days to the present. Each of the weekly inspections was done by a "qualified person" and addressed the seven things outlined in the paragraph above. No items or issues of concern were identified or noted or in any of these weekly inspections. These weekly inspections did not show any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of this CCR unit.

2.2.2 Review of Previous Annual Inspections

Since this rule has only been in place since October 19, 2015, this is the first annual inspection and there are no previous annual inspections to review. Accordingly, no review of previous annual inspections was able to be conducted as part of this first annual inspection.

2.2.3 Visual Inspection

A visual inspection of this CCR landfill was conducted on January 7, 2015. This visual inspection looked for signs of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. The visual inspection did not find any conditions that are disrupting or have the potential to disrupt the operation or safety of this CCR unit.

3.0 Annual Inspection Report

3.1 Requirements for Annual Inspection Report

In accordance with §257.84(b)(2), the annual inspection report must address each of the following (in addition to the findings of the annual inspection discussed above):

(i) Any changes in the geometry of the structure since the previous annual inspection;

(ii) The approximate volume of CCR contained in the unit at the time of the inspection;

(iii) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and

(iv) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

3.2 Annual Inspection Report

3.2.1 Changes in Geometry of Structure since Previous Annual Inspection

This is the initial annual inspection.

3.2.2 Approximate Volume of CCR Contained in CCR Unit at Time of Inspection

The approximate volume of CCR contained in the CCR unit at time of inspection was 11,075,673 cubic yards.

3.2.3 Appearances of Structural Weakness with Potential to Disrupt Operation/Safety

During the visual inspection and review of available information as discussed above in Section 2.2 above, no appearances of an actual or potential structural weakness of this CCR unit or any existing conditions were found that are disrupting or have the potential to disrupt the operation and safety of this CCR unit.

3.2.4 Changes which may have affected CCR Unit since Previous Annual Inspection

This is the initial annual inspection.

4.0 Qualified Professional Engineer

The rule requires that an annual inspection be done the corresponding annual inspection report be prepared by a qualified professional engineer. This annual inspection and corresponding annual inspection report were done by Hyrum Blaine Ipson who is a qualified professional engineer. He is a registered professional engineer and has been conducting inspections on surface water storage impoundment embankments for more than 32 years and inspections on landfills for more than 26 years.

I certify that I conducted this annual inspection and prepared the corresponding annual inspection report. The information contained herein is accurate to the best of my knowledge.

Hyrum Blaine Ipson — January 18, 2016

Hyrum Blaine Ipson | Date

LICENSED PROFESSIONAL ENGINEER
No. 168299-2202
HYRUM BLAINE IPSON
Date 01-18-2016
STATE OF UTAH

Intermountain Power Combustion By-Products CCR Landfill

Checklist for Annual Inspections of CCR Landfills

Annual inspections shall be conducted to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This checklist is intended to provide general guidance to comply with the minimum requirements for the annual inspection and report of CCR Landfills as outlined in §257.84(b) for the CCR rule. The annual inspection and report must be completed and certified by a qualified professional engineer (i.e., an individual who is licensed by the state where the CCR Unit is located as a professional engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart). The following checklist items for the inspection and report should be addressed:

1. Review of Operational Records (as applicable) including:

   ☒ Results of Inspections by A Qualified Person;
   ☐ Results of Previous Annual Inspections; Initial - No Previous
   ☐ Other Documents: ____________________

   Comments: All inspections done as required, no problems identified in records.

2. Conducted a visual inspection of the CCR unit to identify signs of distress or malfunction of the unit and appurtenant structures.

   ☒ Yes ☐ No Comments: No apparent signs of distress or malfunction.

3. After the inspection, an inspection report addressing items one (1) and two (2) above must be compiled. This report must also include:

   ☐ Changes in geometry of the CCR Landfill since the previous annual inspection. Initial - no previous
   ☒ Approximate volume of CCR contained in the CCR Landfill. Storage capacity of the CCR Landfill structure at the time of the inspection. 11,075,673 cubic yards - surveyed
   ☒ Any appearances of actual or potential structural weakness of the CCR Landfill. None found.
   ☒ Any existing conditions that are disrupting of have the potential to disrupt the operation and safety of the CCR Landfill and appurtenant structures. None found
   ☐ Any other changes which may have affected the stability or operation of the CCR Landfill since the previous annual inspection. Initial - no previous

   Comments: The approximate volume of CCR contained in landfill was surveyed by licensed surveyor Doug Grimshaw.

Name of Qualified Professional Engineer: Hyrum Blaine Ipson

License Number: Utah 168299-2202

Date of Inspection/Report: Inspection: 01/07/16 Report: 01/18/16

Signature: Hyrum Blaine Ipson

Initial Annual Inspection Report

Intermountain Power Bottom Ash Basin (UT00463)
CCR Surface Impoundment

January 18, 2016

Table of Contents

1.0 Introduction

On April 17, 2015 the EPA published its final rule in the Federal Register to regulate disposal of coal combustion residuals (CCR) as a solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The effective date of this final rule was October 19, 2015. This final rule established several requirements for existing and new CCR landfills and existing and new CCR surface impoundments. Among them was the requirement to have a qualified professional engineer conduct annual inspections and prepare annual reports on each of the CCR units, with the initial annual inspection and report due no later than January 18, 2016. The requirements for the annual inspections and reports for CCR surface impoundments are outlined in §257.83(b).

The Intermountain Power Project (IPP) is located in Millard County Utah. The IPP is owned by Intermountain Power Agency (IPA) and operated locally by Intermountain Power Service Corporation (IPSC). IPP has two CCR surface impoundments. This annual inspection report is for one of these CCR surface impoundments, namely "Intermountain Power Bottom Ash Basin (UT00463)".

The purpose of this report is to document the annual inspection and annual report on the Intermountain Power Bottom Ash Basin (UT00462) surface impoundment. This is the first or initial annual report done on this CCR surface impoundment since the rule went into effect on October 19, 2015. This report covers the period of time from October 19, 2015 until the date of this report.

2.0 Requirements for Annual Inspection

2.1 Requirements for the Annual Inspection

In accordance with §257.83(b)(1), the annual inspection must include a review of available information regarding the status and condition of the CCR unit, including but not limited to, files available in the operating record such as the results or findings of inspections by a qualified person, the results or findings of previous annual inspections, and a visual inspection of the CCR unit and appurtenant structures to identify signs of distress or malfunction.

2.2 Findings of Initial Annual Inspection

The initial annual inspection on this CCR surface impoundment was performed by Hyrum Blaine Ipson who is a licensed professional engineer in the State of Utah. A copy of the inspection checklist used for the inspection is included as an attachment to this report. The annual inspection also included a review of the operating record for weekly inspections and the monitoring instrumentation inspections, a review of previous annual inspections, and a visual inspection of this CCR unit.

2.2.1 Review of Operating Record (Weekly Inspections)

The rule requires that inspections be done on CCR units by a "qualified person" at intervals not to exceed seven days, and that the results of these inspections be put into the operating record. For the purposes of this annual inspection report, these inspections will be called "weekly inspections". These weekly inspections must look for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. This would include inspecting for (1) excessive, turbid, or sediment-laden seepage; (2) signs of piping and other internal erosion; (3) transverse, longitudinal, and desiccation cracking; (4) slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; (5) abnormally high or low pool levels; (6) animal burrows; (7) excessive or lacking vegetative cover; (8) slope erosion; and (9) debris; (10) abnormal discoloration, flow, or discharge of debris or sediment at outlets; (11) dust controlled.

A review was done on all of the weekly inspections found in the operating record which have been conducted since the rule went into effect on October 17, 2015. The first weekly inspection on this CCR unit was conducted on October 21, 2015. Subsequent weekly inspections have since been done on this CCR unit at intervals not exceeding seven days since then to the present. Each of the weekly inspections was done by a "qualified person" and addressed the eleven things outlined above. No items or issues of concern were identified or noted in any of these weekly inspections. These weekly inspections did not show any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of this CCR unit.

2.2.2 Review of Operating Record (30-Day Monitoring Instrumentation Inspections)

The rule requires that the monitoring instrumentation for this CCR unit be inspected at intervals not exceeding 30 days by a "qualified person" and that the results of this monitoring be recorded in the operating record. For the purposes of this report, these inspections will be called "30-day instrumentation inspections". This CCR surface impoundment is only equipped with basic monitoring instrumentation devices. It has eleven perched wells, and a staff gauge to measure the water surface pool elevation.

A review was done on all of the 30-day instrumentation inspections found in the operating record that have been conducted since the rule went into effect on October 17, 2015. The first 30-day inspection was done on November 9, 2015, the next one on December 8, 2015, and the next on January 7, 2016. Each of these 30-day instrumentation inspections was done by a "qualified person". No items or issues of concern were identified or noted in any of these inspections.

2.2.3 Review of Previous Annual Inspections

Since this rule has only been in place since October 19, 2015, this is the initial annual inspection and there are no previous annual inspections to review. Accordingly, no review of previous annual inspections was able to be conducted as part of this first annual inspection.

2.2.4 Visual Inspection

A visual inspection of this CCR surface impoundment was conducted by the professional engineer on January 7, 2016. This visual inspection looked for signs of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit including the hydraulic structures. The visual inspection did not identify any conditions that are disrupting or have the potential to disrupt the operation and safety of this CCR unit.

3.0 Requirements for Annual Inspection Report

3.1 Requirements for the Annual Inspection Report

In accordance with §257.83(b)(2), the annual inspection report must address each of the following (in addition to the findings of the annual inspection discussed above):

(i) Any changes in geometry of the impounding structure since the previous annual inspection;

(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

(iv) The storage capacity of the impounding structure at the time of the inspection;

(v) The approximate volume of the impounded water and CCR at the time of the inspection;

(vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and

(vii) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

3.2 Annual Inspection Report

3.2.1 Changes in Geometry of Impounding Structure since Previous Annual Inspection

This is the initial annual inspection.

3.2.2 Location/Type of Instrumentation & Readings since Previous Annual Inspection

The monitoring instrumentation for this CCR surface impoundment consists of eleven perched wells spaced around its perimeter and a staff gauge on the outlet structure to measure the water surface elevation. This is the initial annual inspection.

3.3.3 Minimum, Maximum, and Present Depth/Elevation to Water and CCR since Previous Annual Inspection

This is the initial annual inspection.

3.2.4 Storage Capacity at Time of Inspection

This CCR surface impoundment has a storage capacity of approximately 3420 acre-feet.

3.2.5 Volume of Water and CCR at Time of Inspection

The combined volume of water and CCR in this CCR unit at the time of inspection was approximately 2189 acre-feet.

3.2.6 Appearances of Structural Weakness with Potential to Disrupt Operation/Safety

During the visual inspection and review of available information as discussed above in Section 2.2, no appearances of an actual or potential structural weakness of this CCR unit or any existing conditions were found that are disrupting or have the potential to disrupt the operation and safety of this CCR unit.

3.2.7 Changes which may have Affected Unit since Previous Annual Inspection

This is the initial annual inspection.

4.0 Qualified Professional Engineer

The rule requires that an annual inspection be done the corresponding annual inspection report be prepared by a qualified professional engineer. This annual inspection and corresponding annual inspection report were done by Hyrum Blaine Ipson who is a qualified professional engineer. He is a registered professional engineer and has been conducting inspections on surface water storage impoundment embankments for over 32 years and inspections on landfills for over 26 years.

I certify that I conducted this annual inspection and prepared the corresponding annual inspection report, and that the information contained herein is true and correct to the best of my knowledge.

Hyrum Blaine Ipson ______________________ January 18, 2016

Hyrum Blaine Ipson   Date

LICENSED PROFESSIONAL ENGINEER
No. 168299-2202
HYRUM BLAINE IPSON
Date 01-18-2016
STATE OF UTAH

Intermountain Power Bottom Ash Basin (UT00463)

Checklist for Annual Inspections of CCR Surface Impoundments

Annual inspections shall be conducted to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This checklist is intended to provide general guidance to comply with the minimum requirements for the annual inspection and report of CCR surface impoundments as outlined in §257.83(b). The annual inspection and report must be completed and certified by a qualified professional engineer (i.e., an individual who is licensed by the state where the CCR Unit is located as a professional engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart). The following checklist items for the inspection and report should be addressed:

1. Review of Operational Records (as applicable) including:

   - ☐ Design and Construction Information Initial Not available yet - 1st one due 10-17-16
   - ☐ Previous Periodic Structural Stability Assessments Not available yet, 1st one due 10-17-16
   - ☒ Results of Weekly Inspection by A Qualified Person Reviewed - no issues.
   - ☒ Results of Monthly Inspections/Monitoring by A Qualified Person Reviewed - no issues
   - ☐ Results of Previous Annual Inspections Not available yet, this is 1st one due Jan. 18, 2016
   - ☐ Other Documents: ________

   Comments: Reviewed all available records.

2. Conducted a visual inspection of the CCR unit to identify signs of distress or malfunction of the unit and appurtenant structures.

   ☒ Yes ☐ No Comments: No apparent signs of distress or malfunction of the unit and appurtenant structures. Did this visual on Jan. 7, 2016.

3. Conducted a visual inspection of hydraulic structures underlying the base of the CCR unit or passing through the dike of the unit (applicable to surface impoundments only) for structural integrity and continued safe and reliable operation.

   ☒ Yes ☐ No Comments: No observable problems.

4. After the inspection, an inspection report addressing items one (1) through three (3) above must be compiled. This report must also include:

   - ☐ Changes in geometry of the impounding structure since the previous annual inspection. This is initial inspection, no previous available
   - ☒ Location and type of existing instrumentation. 11 perched wells around perimeter, staff guage

- [ ] Maximum recorded readings for each instrument since the previous annual inspection. Initial – no previous available
- [ ] Approximate minimum, maximum, and present depth and elevation of impounded water since the previous annual inspection. Initial – no previous
- [ ] Approximate minimum, maximum, and present depth and elevation of impounded CCR since the previous annual inspection. Initial – no previous
- [x] Storage capacity of the impounding structure at the time of the inspection. 3420 AF-surveyed
- [x] Approximate volume of impounded water at the time of the inspection. } combined total 2189 AF
- [x] Approximate volume of impounded CCR at the time of the inspection. }
- [x] Any appearances of actual or potential structural weakness of the CCR unit. None observed
- [x] Any existing conditions that are disrupting of have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures. None observed
- [ ] Any other changes which may have affected the stability or operation of the impounding structure since the previous annual inspection. Initial – no previous available

Comments: The capacity and combined volume of CCR and water was surveyed by a licensed surveyor – Doug Grimshaw.

Name of Qualified Professional Engineer: Hyrum Blaine Ipson

License Number: 168299-2202 Utah

Date of Inspection/Report: Inspection- 01/07/16 Report- 01/18/16

Signature: Hyrum Blaine Ipson

Initial Annual Inspection Report

Intermountain Power Waste Water Basin (UT00468)
CCR Surface Impoundment

January 18, 2016

Table of Contents

1.0 Introduction

On April 17, 2015 the EPA published its final rule in the Federal Register to regulate disposal of coal combustion residuals (CCR) as a solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The effective date of this final rule was October 19, 2015. This final rule established several requirements for existing and new CCR landfills and existing and new CCR surface impoundments. Among them was the requirement to have a qualified professional engineer conduct annual inspections and prepare annual reports on each of the CCR units, with the initial annual inspection and report due no later than January 18, 2016. The requirements for the annual inspections and reports for CCR surface impoundments are outlined in §257.83(b).

The Intermountain Power Project (IPP) is located in Millard County Utah. The IPP is owned by Intermountain Power Agency (IPA) and operated locally by Intermountain Power Service Corporation (IPSC). IPP has two CCR surface impoundments. This annual inspection report is for one of these CCR surface impoundments, namely "Intermountain Power Waste Water Basin (UT00468)".

The purpose of this report is to document the annual inspection and annual report on the Intermountain Power Waste Water Basin (UT00468) surface impoundment. This is the first or initial annual report done on this CCR surface impoundment since the rule went into effect on October 19, 2015. This report covers the period of time from October 19, 2015 until the date of this report.

2.0 Requirements for Annual Inspection

2.1 Requirements for the Annual Inspection

In accordance with §257.83(b)(1), the annual inspection must include a review of available information regarding the status and condition of the CCR unit, including but not limited to, files available in the operating record such as the results or findings of inspections by a qualified person, the results or findings of previous annual inspections, and a visual inspection of the CCR unit and appurtenant structures to identify signs of distress or malfunction.

2.2 Findings of Initial Annual Inspection

The initial annual inspection on this CCR surface impoundment was performed by Hyrum Blaine Ipson who is a licensed professional engineer in the State of Utah. A copy of the inspection checklist used for the inspection is included as an attachment to this report. The annual inspection also included a review of the operating record for weekly inspections and for monitoring instrumentation inspections, a review of previous annual inspections, and a visual inspection of this CCR unit.

2.2.1 Review of Operating Record (Weekly Inspections)

The rule requires that inspections be done on CCR units by a "qualified person" at intervals not to exceed seven days, and that the results of these inspections be put into the operating record. For the purposes of this annual inspection report, these inspections will be called "weekly inspections". These weekly inspections must look for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit. This would include inspecting for (1) excessive, turbid, or sediment-laden seepage; (2) signs of piping and other internal erosion; (3) transverse, longitudinal, and desiccation cracking; (4) slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; (5) abnormally high or low pool levels; (6) animal burrows; (7) excessive or lacking vegetative cover; (8) slope erosion; and (9) debris; (10) abnormal discoloration, flow, or discharge of debris or sediment at outlets; (11) dust controlled.

A review was done on all of the weekly inspections found in the operating record which have been conducted since the rule went into effect on October 17, 2015. The first weekly inspection on this CCR unit was conducted on October 21, 2015. Subsequent weekly inspections have since been done on this CCR unit at intervals not exceeding seven days since then to the present. Each of the weekly inspections was done by a "qualified person" and addressed the eleven things outlined above. No items or issues of concern were identified or noted in any of these weekly inspections. These weekly inspections did not show any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of this CCR unit.

2.2.2 Review of Operating Record (30-Day Monitoring Instrumentation Inspections)

The rule requires that the monitoring instrumentation inspections for this CCR unit be done at intervals not exceeding 30 days by a "qualified person" and that the results of this monitoring be recorded in the operating record. For the purposes of this report, these inspections will be called "30-day instrumentation inspections". This CCR surface impoundment is only equipped with basic monitoring devices. It has seven perched wells as well as a staff gauge.

A review was done on all of the 30-day instrumentation inspections found in the operating record that have been conducted since the rule went into effect on October 17, 2015. The first 30-day instrumentation inspection was done on November 9, 2015, the next one on December 8, 2015, and the next on January 7, 2016. Each of these 30-day instrumentation inspections was done by a "qualified person". No items or issues of concern were identified or noted in any of these inspections.

2.2.3 Review of Previous Annual Inspections

Since this rule has only been in place since October 19, 2015, this is the initial annual inspection and there are no previous annual inspections to review. Accordingly, no review of previous annual inspections was able to be conducted as part of this first annual inspection.

2.2.4 Visual Inspection

A visual inspection of this CCR surface impoundment was conducted on January 7, 2016. This visual inspection looked for signs of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit including the hydraulic structures. The visual inspection did not identify any conditions that are disrupting or have the potential to disrupt the operation and safety of this CCR unit.

3.0 Requirements for Annual Inspection Report

3.1 Requirements for the Annual Inspection Report

In accordance with §257.83(b)(2), the annual inspection report must address each of the following (in addition to the findings of the annual inspection discussed above):

(i) Any changes in geometry of the impounding structure since the previous annual inspection;

(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

(iv) The storage capacity of the impounding structure at the time of the inspection;

(v) The approximate volume of the impounded water and CCR at the time of the inspection;

(vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and

(vii) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

3.2 Annual Inspection Report

3.2.1 Changes in Geometry of Impounding Structure since Previous Annual Inspection

This is the initial annual inspection.

3.2.2 Location/Type of Instrumentation & Readings since Previous Annual Inspection

The monitoring instrumentation for this CCR surface impoundment consists of seven perched wells spaced around its perimeter and a staff gauge on the outlet structure to measure the water surface elevation. This is the initial annual inspection.

3.3.3 Minimum, Maximum, and Present Depth/Elevation to Water and CCR since Previous Annual Inspection

This is the initial annual inspection.

3.2.4 Storage Capacity at Time of Inspection

This CCR surface impoundment has a storage capacity of approximately 917 acre-feet.

3.2.5 Volume of Water and CCR at Time of Inspection

The combined volume of water and CCR in the CCR unit at time of inspection was approximately 783 acre-feet.

3.2.6 Appearances of Structural Weakness with Potential to Disrupt Operation/Safety

During the visual inspection and review of available information as discussed above in Section 2.2, no appearances of an actual or potential structural weakness of this CCR unit or any existing conditions were found that are disrupting or have the potential to disrupt the operation and safety of this CCR unit.

3.2.7 Changes which may have Affected Unit since Previous Annual Inspection

This is the initial annual inspection.

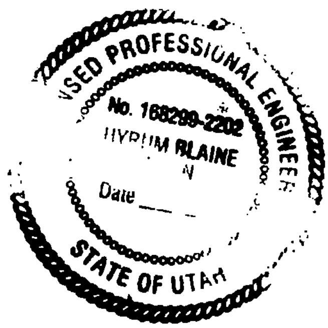
4.0 Qualified Professional Engineer

The rule requires that an annual inspection be done the corresponding annual inspection report be prepared by a qualified professional engineer. This annual inspection and corresponding annual inspection report were done by Hyrum Blaine Ipson who is a qualified professional engineer. He is a registered professional engineer and has been conducting inspections on surface water storage impoundment embankments for over 32 years and inspections on landfills for over 26 years.

I certify that I conducted this annual inspection and prepared the corresponding annual inspection report, and that the information contained herein is true and correct to the best of my knowledge.

______________________________   ____________________

Hyrum Blaine Ipson   Date



I certify that I conducted this annual inspection and prepared the corresponding annual inspection report, and that the information contained herein is true and correct to the best of my knowledge.

Hyrum Blaine Ipson — January 18, 2016

Hyrum Blaine Ipson — Date

Intermountain Pwr Waste Water Basin (UT00468)

Checklist for Annual Inspections of CCR Surface Impoundments

Annual inspections shall be conducted to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. This checklist is intended to provide general guidance to comply with the minimum requirements for the annual inspection and report of CCR surface impoundments as outlined in §257.83(b). The annual inspection and report must be completed and certified by a qualified professional engineer (i.e., an individual who is licensed by the state where the CCR Unit is located as a professional engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart). The following checklist items for the inspection and report should be addressed:

1. Review of Operational Records (as applicable) including:

   - ☐ Design and Construction Information Not available yet - 1st one due 10-17-16
   - ☐ Previous Periodic Structural Stability Assessments Not available yet, 1st one due 10-17-16
   - ☒ Results of Weekly Inspection by A Qualified Person Reviewed- no issues.
   - ☒ Results of Monthly Inspections/Monitoring by A Qualified Person Reviewed- no issues
   - ☐ Results of Previous Annual Inspections Not available yet, this is 1st one due Jan.18, 2016
   - ☐ Other Documents: ______

   Comments: Reviewed all available records.

2. Conducted a visual inspection of the CCR unit to identify signs of distress or malfunction of the unit and appurtenant structures.

   ☒ Yes ☐ No Comments: No apparent signs of distress or malfunction of the Unit and appurtenant structures. Did this visual on Jan. 7, 2016.

3. Conducted a visual inspection of hydraulic structures underlying the base of the CCR unit or passing through the dike of the unit (applicable to surface impoundments only) for structural integrity and continued safe and reliable operation.

   ☒ Yes ☐ No Comments: No problems observed.

4. After the inspection, an inspection report addressing items one (1) through three (3) above must be compiled. This report must also include:

   - ☐ Changes in geometry of the impounding structure <u>since</u> the <u>previous</u> annual inspection. Initial- no previous
   - ☒ Location and type of existing instrumentation. 7 perched wells around perimeter, staff gauge.

☐ Maximum recorded readings for each instrument since the previous annual inspection. Initial - no previous
☐ Approximate minimum, maximum, and present depth and elevation of impounded water since the previous annual inspection. Initial - no previous
☐ Approximate minimum, maximum, and present depth and elevation of impounded CCR since the previous annual inspection. Initial - no previous
☒ Storage capacity of the impounding structure at the time of the inspection. ≈917 AF - surveyed
☒ Approximate volume of impounded water at the time of the inspection. } combined ≈ 783 AF surveyed
☒ Approximate volume of impounded CCR at the time of the inspection. }
☒ Any appearances of actual or potential structural weakness of the CCR unit. None Observed
☒ Any existing conditions that are disrupting of have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures. None observed
☐ Any other changes which may have affected the stability or operation of the impounding structure since the previous annual inspection. Initial - No Previous

Comments: The capacity of impoundment and combined volume of water and CCR were surveyed by licensed surveyor Doug Grimshaw

Name of Qualified Professional Engineer: Hyrum Blaine Ipson

License Number: Utah 168299-2202

Date of Inspection/Report: Inspection: 01/07/16 Report: 01/18/16

Signature: Hyrum Blaine Ipson

Appendix F.

INTERMOUNTAIN POWER SERVICE CORPORATION

August 30, 2016

Mr. Scott Anderson, Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, UT
84114-4880

Dear Mr. Anderson,

Coal Combustion Residual Rule Notifications

As per 40 CFR 257.106(h)(2) and Subsection R315-319-106(h)(2), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the groundwater monitoring system certification specified under 40 CFR 257.105(h)(3) and Subsection R315-319-105(h)(3). The groundwater monitoring system certification is contained in the Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report that has been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

As per 40 CFR 257.106(g)(5), 40 CFR 257.106(g)(7), Subsection R315-319-106(g)(5), and Subsection R315-319-106(g)(7), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the periodic inspection reports specified under 40 CFR 257.105(g)(6), 40 CFR 257.105(g)(9), Subsection R315-319-105(g)(6), and Subsection R315-319-105(g)(9). Individual reports for the Intermountain Power Combustion By-products Landfill, the Intermountain Power Bottom Ash Basin (UT00463), and the Intermountain Power Waste Water Basin (UT00468) each titled Initial Annual Inspection Report have been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

If you have any questions or comments, please contact Mr. Mike Utley at (435) 864-6489, or by email at mike.utley@ipsc.com.

Cordially,

Jon A. Finlinson
President and Chief Operations Officer

MU/HBI:he

cc: Bradford L. Packer
Kevin Peng

Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report

Compliance with CCR Rule
§257.91 Ground Water Monitoring Systems
and corresponding
§257.105(h)(2 & 3) Recordkeeping
Requirements

Intermountain Generating Facility
Delta, Utah

Stantec

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
Stantec Consulting Services, Inc.
8160 South Highland Drive
Sandy, UT 84093

Project No.: 203709098

November 30, 2015

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services, Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: ______________________

John G. Russell, III, CPG
Utah PG #5216074-2250
Sr. Hydrogeologist, Environmental Risk Manager

Reviewed by: ______________________

Mark Atencio, P.E.
Sr. Project Manager, Water/Wastewater

PROFESSIONAL ENGINEER
No. 191306-2202
MARK G ATENCIO
STATE OF UTAH

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1.0 INTRODUCTION

On behalf of Intermountain Power Service Corporation (IPSC), Stantec Consulting Services, Inc. ("Stantec") has prepared this report to document IPSC's ground water monitoring well design and installation program at IPSC's Intermountain Generating Facility (IGF) located approximately 10 miles north of Delta, Millard County, Utah. The monitoring program addresses elements prescribed by the United States Environmental Protection Agency's (USEPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities [RIN-2050-AE81; FRL-9149-4] (USEPA Final CCR Rule) Title 40, Part §257.91 *Ground Water Monitoring Systems*.

This report details IPSC's objectives and anticipated means, measures, and procedures for satisfying ground water monitoring well design, installation, and development protocol for IPSC's three (3) CCR-regulated units, specifically including:

- Combustion By-Products Landfill (CB Landfill);
- Bottom Ash Surface Impoundment; and
- Wastewater Retention Surface Impoundment.

In conjunction with USEPA requisites prescribed by CCR Rule Title 40, Part §257.91, this report also addresses relevant guidance and pertinent information presented within the Utah Department of Environmental Quality (UDEQ), Division of Waste Management and Radiation Control's guidance document entitled, Solid and Hazardous Waste *Rule R315-308. Ground Water Monitoring Requirements*.

In summary, the report documents the justification and details associated with IPSC's recent installations of uppermost ground water monitoring wells at each of the three CCR-regulated units, addressing: the total number of wells, well locations, well completion data, well development protocol, and other relevant information supporting Stantec's belief that the ground water monitoring system installed to date has been designed and constructed to satisfy the requirements of CCR Rule Title 40, Part §257.91. In accordance with CCR Rule Title 40, Part §257.90. *Applicability* and Part §257.94. *Detection Monitoring Program*, IPSC intends to implement its ground water sampling, analysis, and statistical analysis program through January 2018 – the results of which may be used to help identify the adequacy of the existing ground water monitoring program.

2.0 General Ground Water Quality Monitoring Program

The primary objective of IPSC's proposed ground water monitoring program is to investigate and monitor if, and to what degree, the uppermost aquifer beneath the CB Landfill, the Bottom Ash Surface Impoundment, and the Wastewater Retention Surface Impoundment might be impacted by release of CCR-related constituents from a respective CCR-regulated unit. The ground water monitoring program was designed in accordance with requisites specified by CCR Rule Title 40, Part §257.91 *Ground Water Monitoring Systems*.

Ground water quality results, as evaluated by January 2018, will dictate, in part, whether supplemental investigative and/or remedial activities might be warranted, as specified by the CCR Rule. The ground water quality monitoring program is to be implemented throughout the lifecycle of each CCR-regulated unit, including each unit's 30-year, post-closure period.

2.1 CCR RULE §257.91. *GROUND WATER MONITORING SYSTEMS ELEMENTS*

Relevant and pertinent sections of CCR Rule §257.91 stipulate the following:

2.1.1 CCR Rule §257.91(a)

The Owner or operator of a CCR unit must install a ground water monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield ground water samples from the uppermost aquifer that:

(1) Accurately represent the quality of background ground water that has not been affected by leakage from a CCR unit.
(2) Accurately represent the quality of ground water passing the waste boundary of the CCR unit. The downgradient monitoring system must be installed at the waste boundary that ensures detection of ground water contamination in the uppermost aquifer. All potential contaminant pathways must be monitored.

2.1.2 CCR Rule §257.91(b)

The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information that must include thorough characterization of:

(1) Aquifer thickness, ground water flow rate, ground water flow direction including seasonal and temporal fluctuations in ground water flow; and
(2) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer, including, but not limited to, thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

2.1.3 CCR Rule §257.91(c)

The ground water monitoring system must include the minimum number of monitoring wells necessary to meet the performance standards specified in paragraph (a) of this section, based on the site-specific information specified in paragraph (b) of this section. The ground water monitoring system must contain:

(1) A minimum of one upgradient and three downgradient monitoring wells; and

(2) Additional monitoring wells as necessary to accurately represent the quality of background groundwater that has not been affected by leakage from the CCR unit and the quality of groundwater passing the waste boundary of the CCR unit.

2.1.4 CCR Rule §257.91(d)

Not applicable, since IPSC did not install any multiunit ground water monitoring systems.

2.1.5 CCR Rule §257.91(e)

Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well borehole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground water samples. The annular space (i.e., the space between the borehole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground water.

3.0 SUBSURFACE LITHOLOGIC AND HYDROGEOLOGIC CHARACTERISTICS

3.1 HISTORICAL SITE INVESTIGATIONS AND SUMMARY FINDINGS

Stantec reviewed copies of historical drilling logs, geologic cross-sectional figures, and related information associated with preliminary site investigative activities conducted during the early- to mid-1980s, prior to construction of the IGF. Dozens of temporary soil test borings and ground water monitoring piezometers were drilled as part of pre-construction, site investigation activities. The deepest soil test borings were completed to approximately 90 feet below grade.

Stantec's review of the historical information indicates that the subsurface in the general vicinity of the CCR-regulated units is typified by an upper, 15- to 30-feet thick zone of unsaturated, interbedded silts, sands, and clay layers overlying comparatively-thicker, unsaturated, clay layers and/or clay-rich soils (all typical Lake Bonneville lacustrine deposits). The deeper clay layers range between 20 to 60 feet thick beneath the IGF. Triaxial chamber permeability testing of the clays quantified values between 3.3×10^{-7} centimeters per second (cm/sec) to 7.9×10^{-9} cm/sec, indicative of relatively tight, impermeable clays.

Uppermost saturated conditions were encountered beneath the thick clay layers within underlying sands and sand-rich soils at subsurface depths generally between 50 to 65 feet below grade. The uppermost aquifer exhibited varying degrees of semi-confined to confined, hydraulic conditions, meaning that uppermost saturated conditions were first encountered during drilling within sand-rich soils located beneath the deep clay layers; however, water levels rose to varying heights above the saturated sands generally within 24 hours following piezometer installations and potentiometric water level stabilization.

The early-1980s, on-site study of ground water flow indicated a predominantly westerly flow pattern beneath the IGF (with localized, southwesterly components of flow in the vicinities of the 1980s-proposed, CCR units). The study suggested that there could be a more southwesterly flow pattern beneath the IGF site, with the passing of time, as the off-site, populated areas located south of the IGF site and north of Delta, Utah expanded and installed an increasing number of ground water production wells. At the time, regional hydrogeologic studies in the general vicinity of the IGF site and Delta, Utah reported definitive changes in subsurface water levels and ground water flow patterns in areas which experienced an increasing number of ground water production well installations and associated ground water recovery.

3.2 HYDROGEOLOGIC FINDINGS ASSOCIATED WITH 2015 CCR MONITORING WELL INSTALLATIONS

As discussed in more detail in the following report section, soil test borings, which were converted to ground water monitoring wells, were drilled during Summer and Fall 2015 along the western, southern, and southwestern waste boundaries of each of the three CCR units at the IGF. The wells were drilled to investigate ground water quality in presumed down-gradient directions in relation to each of the CCR units. Likewise, monitoring wells were also installed generally east/northeast of each CCR unit to investigate water quality located in presumed up-gradient directions in relation to each CCR unit.

In summary, the 2015 soil test borings corroborated the 1980 investigative findings, namely that the subsurface lithologic conditions in the immediate vicinity of each of the three CCR units were similar to those identified historically, generally as follows:

CCR Unit	Depth to Uppermost Sand Aquifer (feet below ground surface-bgs)	Thickness of Clay-Rich Soils Above the Aquifer (in feet-ft.)
Combustion By-Products Landfill (CB Landfill)	between 52 to 78	33 to 57 ft. thick
Bottom Ash Surface Impoundment	between 55 to 60	17 to 33 ft. thick
Wastewater Retention Surface Impoundment	between 48 to 65	8 to 20 ft. thick

Static water level measurements indicate that the uppermost aquifer is under semi-confined to confined, hydraulic conditions, whereby static water levels rose within the wells following well installation and development. Potentiometric water levels recorded during the Fall of 2015 indicate a southwesterly ground water flow pattern in the immediate vicinity of each of the three CCR units.

4.0 2015 CCR Ground Water Monitoring Well Location, Design, Installation, and Development Program

Figure 1 is a generalized site location map, depicting the general site vicinity and the three (3) CCR-regulated units on a topographic map, namely:

- Combustion By-Products Landfill (CB Landfill);
- Bottom Ash Surface Impoundment; and
- Wastewater Retention Surface Impoundment.

In consideration of the presumed westerly to southwesterly ground water flow direction beneath the IGF site, Stantec recommended installation of ground water monitoring wells at locations identified on Figure 2. The wells identified with a "U" in their names are located east/northeast of, and in presumed up-gradient directions in relation to, the three respective CCR units. The wells allocated west, southwest, and south of each CCR unit are deemed down-gradient monitoring wells.

The soil test borings were drilled by the sonic drilling method, whereby soil samples were collected continuously for continuous, real-time visual inspection and Drill Log recording of subsurface soil lithologic and moisture characteristics. Stantec's field geologists screened and logged all soil samples during drilling of each soil test boring. Copies of Stantec's Drilling Logs and field notes are presented in Appendix A. All down-hole drilling and sampling equipment were decontaminated before use between soil test boring locations.

In turn, the subsurface soil data were used to help determine respective ground water monitoring well construction details. Typically, once each soil test boring was advanced several feet into the uppermost saturated soils, a monitoring well was constructed within each respective borehole. Each well screen interval was installed so as to monitor uppermost ground water quality.

The first soil test borings to be drilled as part of the project were borings/wells located west, southwest, and south (i.e., presumed down-gradient) of the CB Landfill. Since these were the initial investigatory, soil test borings, and in an effort to attempt to prevent potential 'carry-down' of soil materials, each of the CB landfill soil test borings was drilled using a 10-inch diameter drill bit, followed by emplacement of an approximate three to four feet thick (3-4 ft.) bentonite pellet seal in the bottom of each borehole, and then continued subsurface drilling and sampling to greater depths using an 8-inch diameter drill bit. All other borings/wells were drilled and sampled, using only an 8-inch diameter drill bit from the ground surface to borehole completion depths.

Once a soil test boring was completed several feet into uppermost saturated soils, then a 4-inch diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) well with solid end-caps was installed. The bottom 10 feet of each well was comprised of 4-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen, with the exception of monitoring wells BAC-3 and BAC-4. Wells BAC-3 and BAC-4 were installed with 20 feet of 4-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen.

Following installation of a well, 16/30 washed, silica sand was emplaced around the well screen from the bottom of the borehole to an approximate height of three to four feet above the top of the well screen interval. An approximate four (4) feet thick bentonite pellet seal was added on top of the sand pack material. Then, a cement-bentonite (typically, 10:1 ratio) grout was tremie-slurried from the top of the bentonite pellet seal to an approximate height of two feet below grade. A 5-ft. long, 6-inch diameter, steel, protective casing/monument was emplaced in concrete around each wellhead, with an approximate 2.5-ft. stick-up above natural grade with the exception of monitoring wells BAC-1, BAC-2, and BAC-3. Monitoring Wells BAC-1, BAC-2, and BAC-3 were completed with a 12-inch diameter flush-grade, metal manhole box with cover, set in concrete, capable of supporting automobile traffic. Each PVC well was furnished with a locking, expandable well cap and lock.

Following well installations, the ground surface and the top of each wellhead were surveyed in relation to one another and an on-site, mean sea level benchmark. Table 1 presents a summary of all ground water monitoring well construction specific details. Copies of Stantec's Drilling Logs and Schematic Well Diagrams are presented in Appendix A.

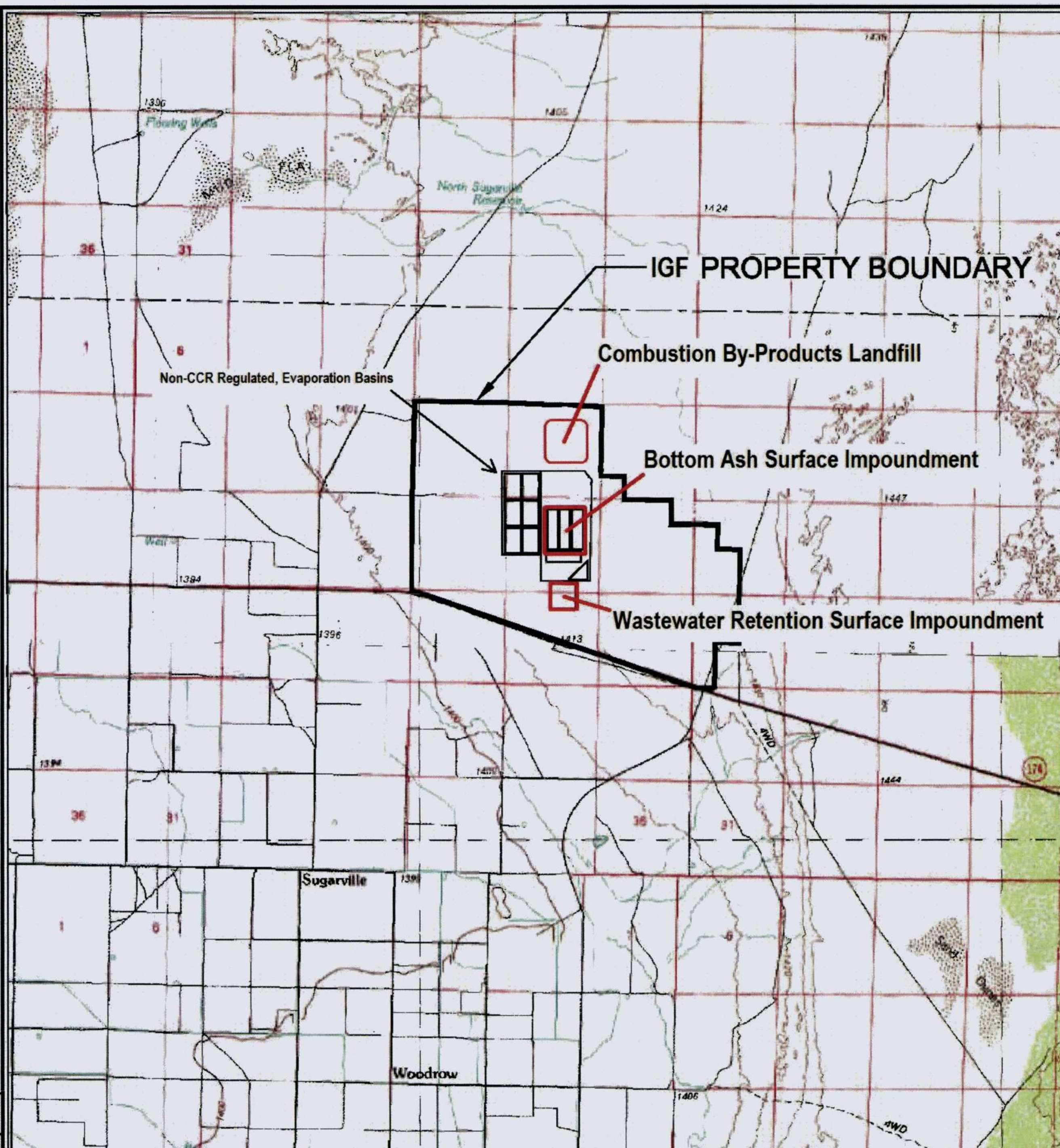
Shortly after well installations, each well was developed by a dedicated, well development drill rig. Typically, the rig removed water from each well by means of air-lift. Well water was removed from each well, until return water was relatively clear and free of fine-grained, formational materials.

5.0 CCR RULE COMPLIANCE

Stantec believes that each monitoring well is located and constructed appropriately for providing means for sampling, analyzing, and monitoring ground water quality from the uppermost section of the unconfined aquifer and to determine hydraulic characteristics in the immediate vicinity of each of the three CCR units at the IGF. Stantec believes that the well locations identified on Figure 2 will provide appropriate monitoring of hydraulically up-gradient (i.e., background ground water that has not been impacted by potential release from a CCR unit) and down-gradient water quality and hydraulic characteristics at all three CCR units.

Stantec's analysis of initial water level measurements at the CCR unit monitoring wells indicates that uppermost ground water beneath each CCR unit is attenuating in a southwesterly direction in relation to each respective CCR unit. The western, southwestern, and southern monitoring wells were drilled as close as practicable to the outer waste boundaries of each respective CCR unit. Stantec believes that the wells provide appropriate spatial distribution in relation to one another and each respective CCR unit. In turn, Stantec anticipates that the down-gradient wells should provide appropriate monitoring of uppermost ground water that might possibly be impacted by a potential release from each CCR unit.

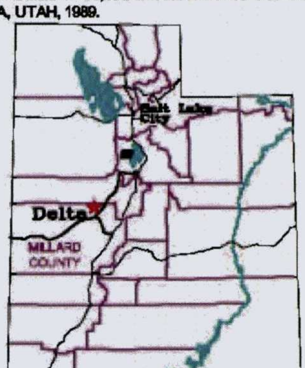
In summary, Stantec believes that the current CCR unit ground water monitoring system has been designed and constructed to satisfy the requirements of CCR Rule Title 40, Part §257.91.



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES



North

CCR-Regulated Units

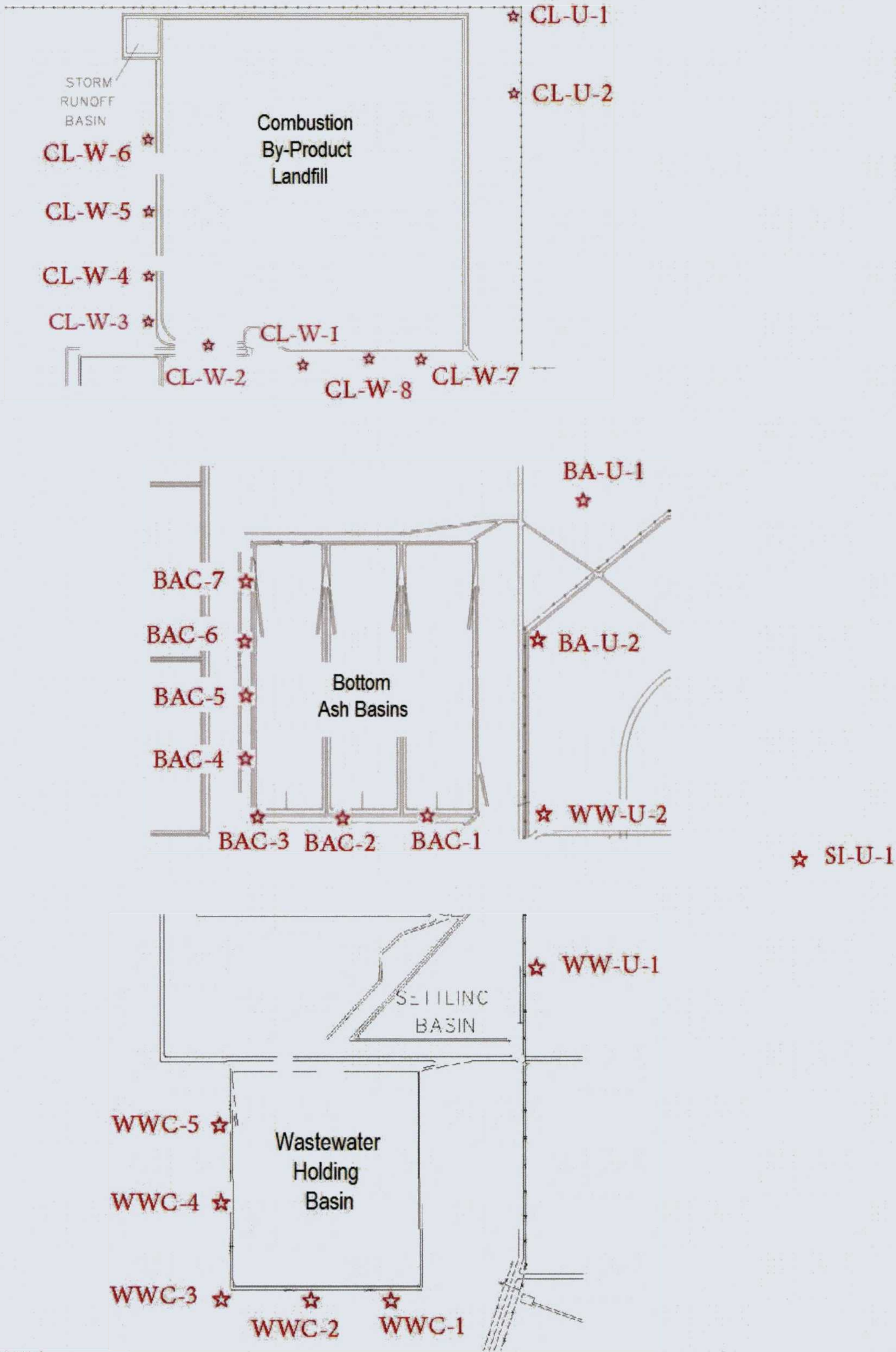
Delta, Utah

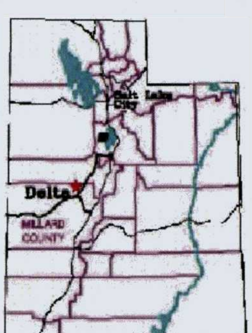
FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'	REVISION	DATE DRAWN

drawings\lpsc-04\Fig2 Site Topographic Map.dwg





N

CCR-Regulated Units

Delta, Utah

FIGURE 2. CCR Unit Monitoring Well Locations

(Generalized Locations)

Stantec

Design By	JR	Drawn By	CP	CH'D By		Not to Scale

DATE DRAWN

REVISION

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Product Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644 03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642 88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640 99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668 70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668 72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648 15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665 73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

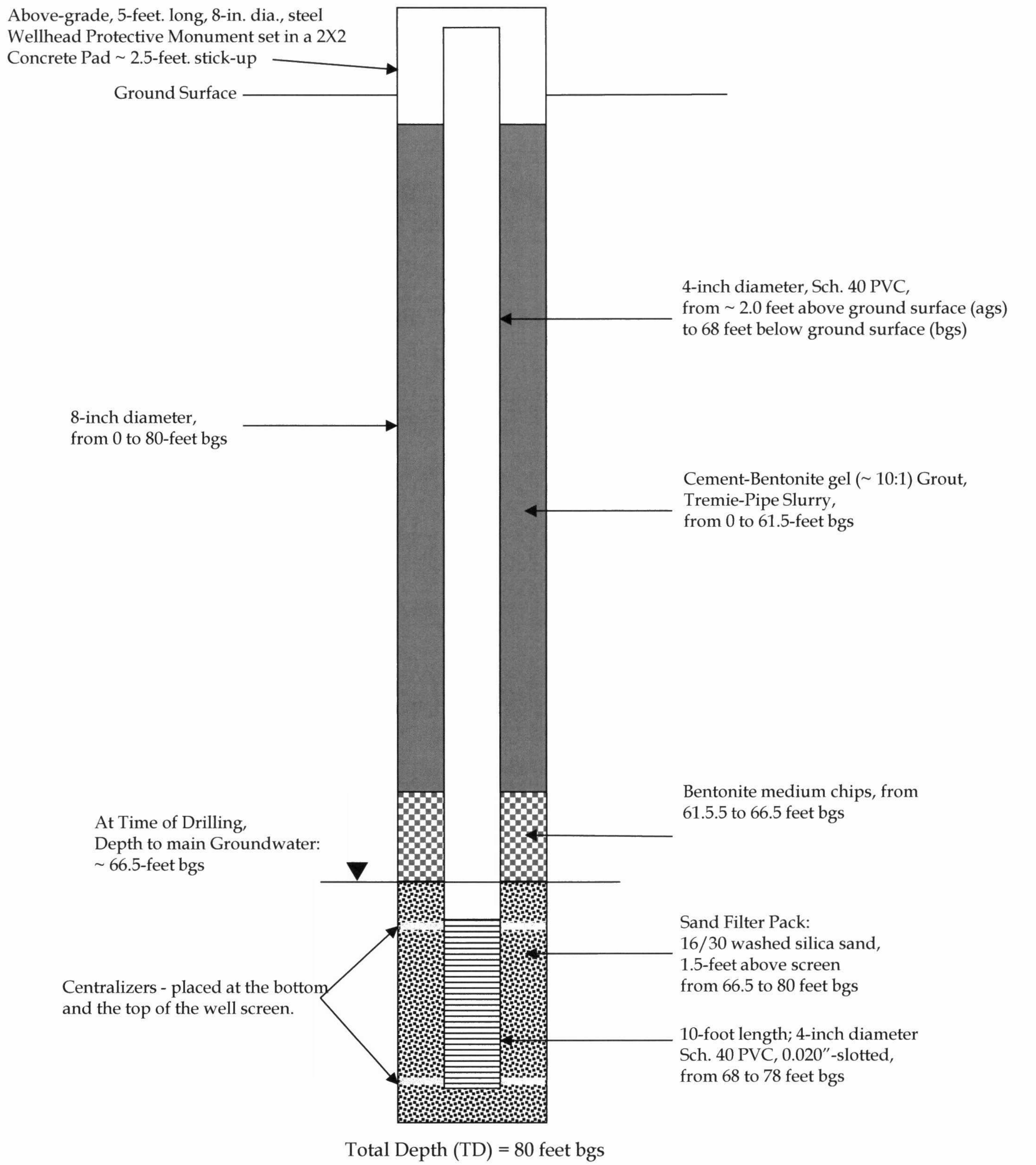
Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Holding Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638 90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640 58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641 75
WC-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WC-U-2	8/11/2015	4-inch PVC	75	65-75	46655.46
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59

BGS = Below Ground Surface

MSL = Mean Sea Level

Appendix A
Copies of Stantec Drilling Logs and Ground Water Monitoring Well Schematic Diagrams

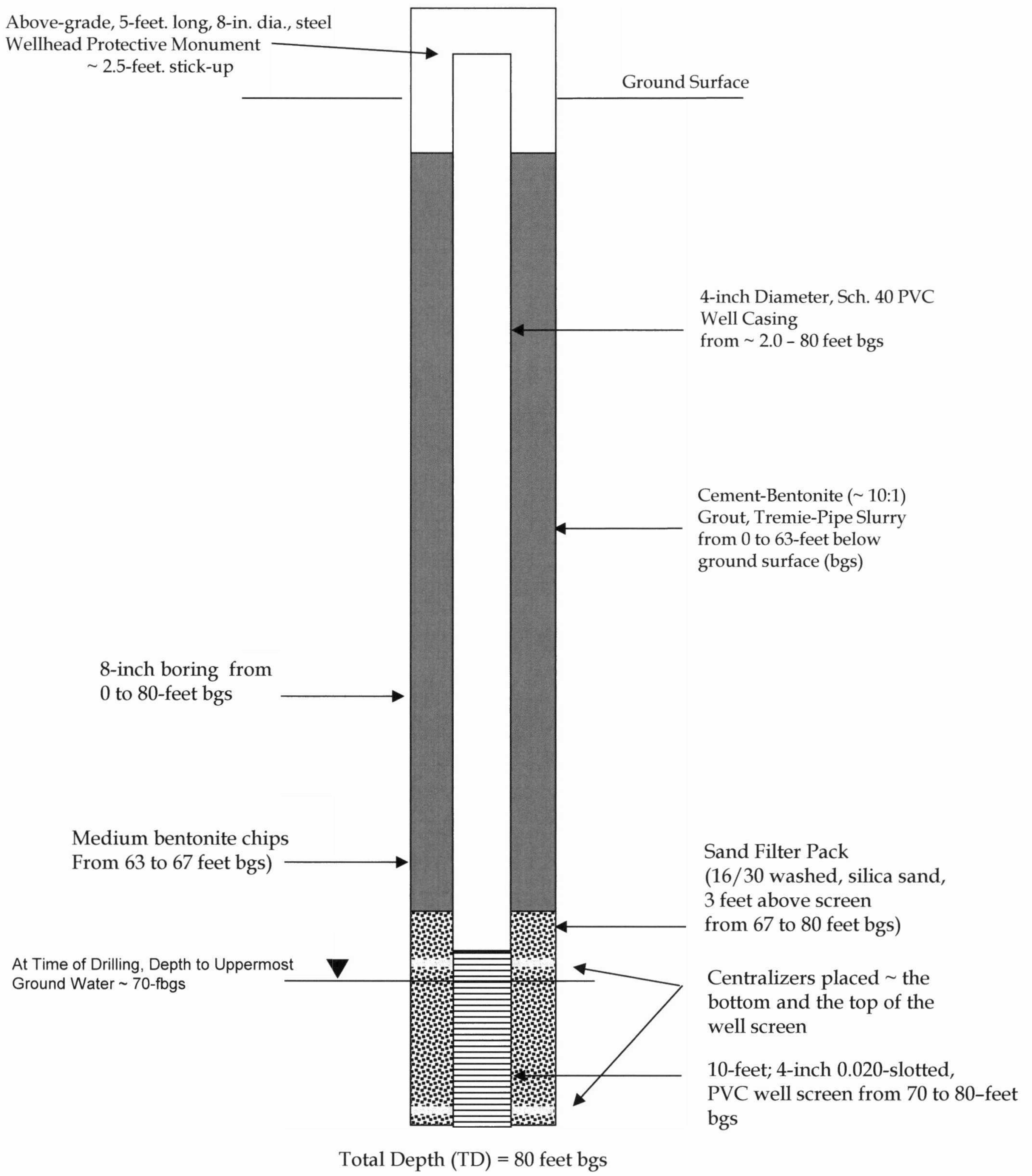


Stantec

IPSC – COMBUSTION BYPRODUCT LANDFILL AREA
DELTA, UTAH

Well CL-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/23/15
			Last Revision Date

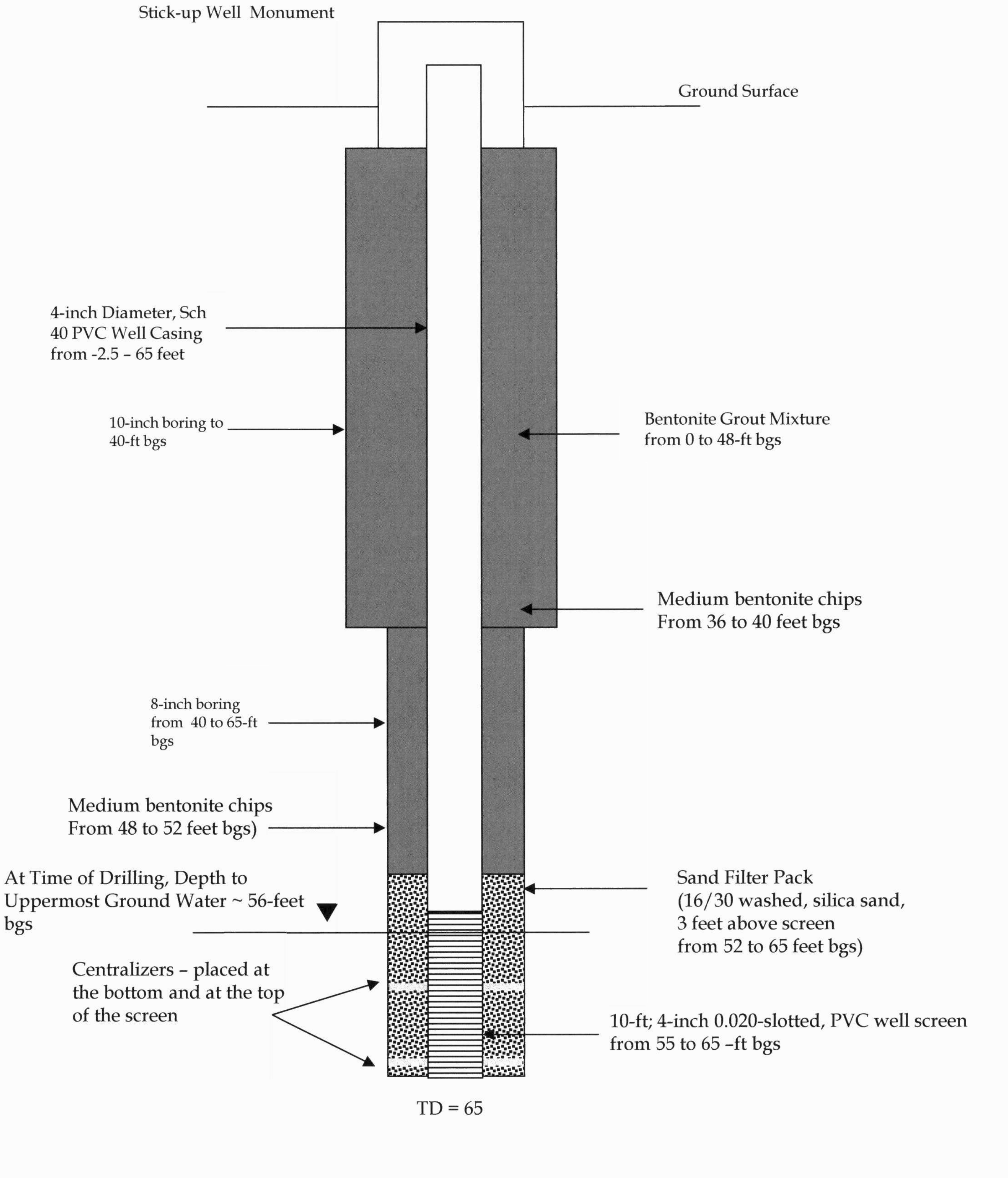


Stantec

IPSC– CB LANDFILL AREA
DELTA, UTAH

Well CLU-2 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

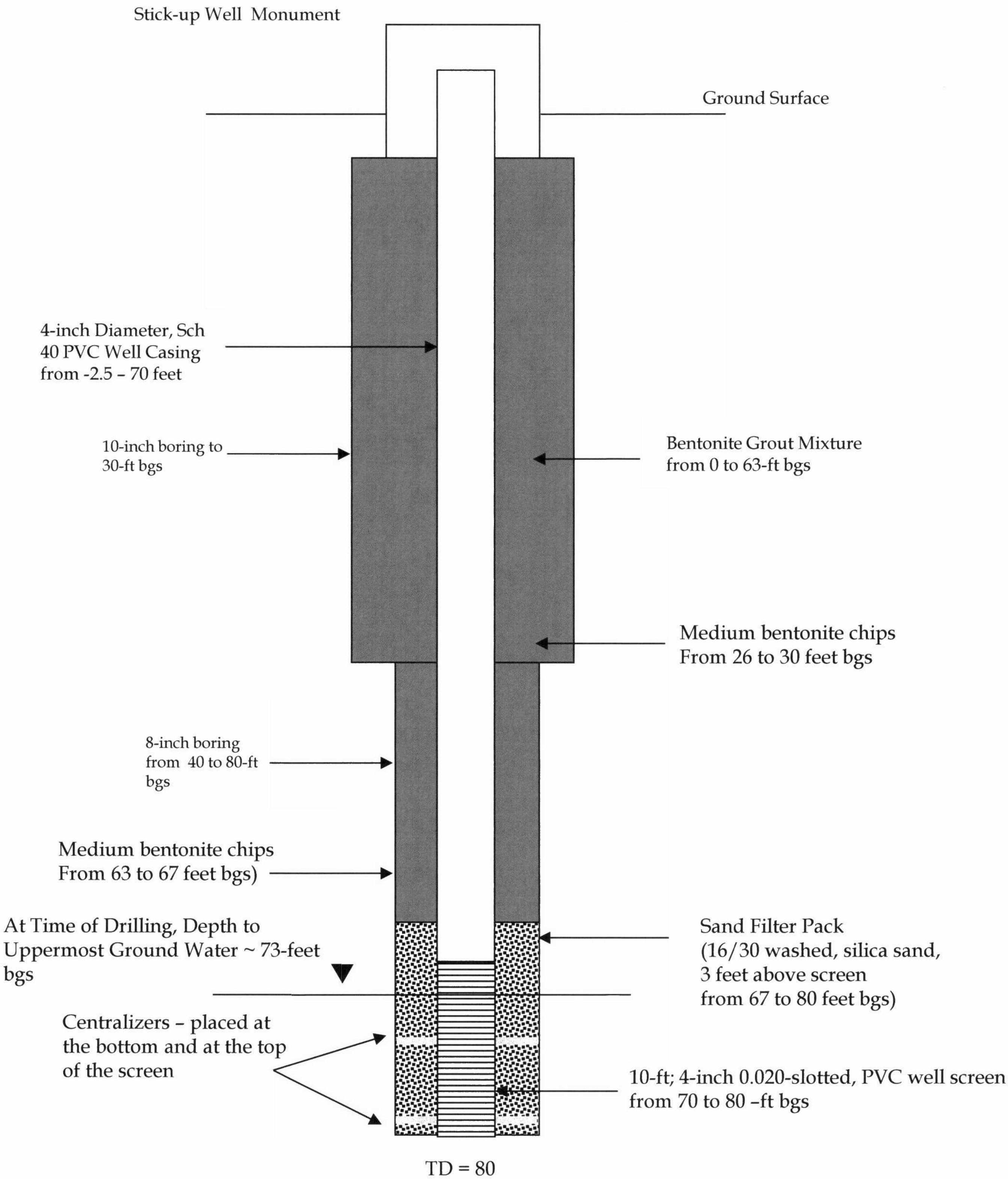


Stantec

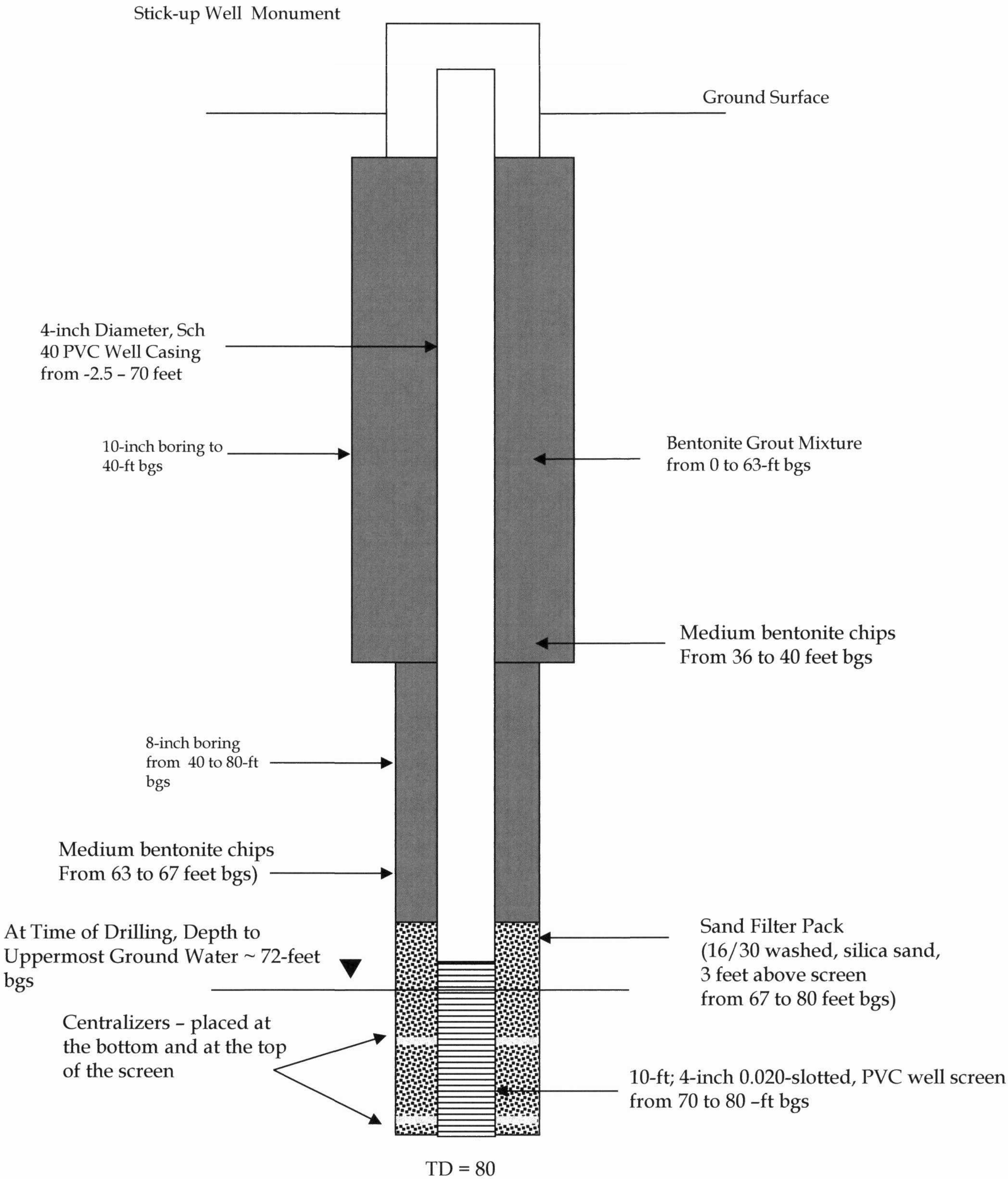
ISPC– LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-1 Schematic

Design by	Drawn by	Scale	Date Drawn / Last Revision Date



Stantec	ISPC– LANDFILL AREA DELTA, UTAH			
	Figure 1 – CLW-2 Schematic			
				Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

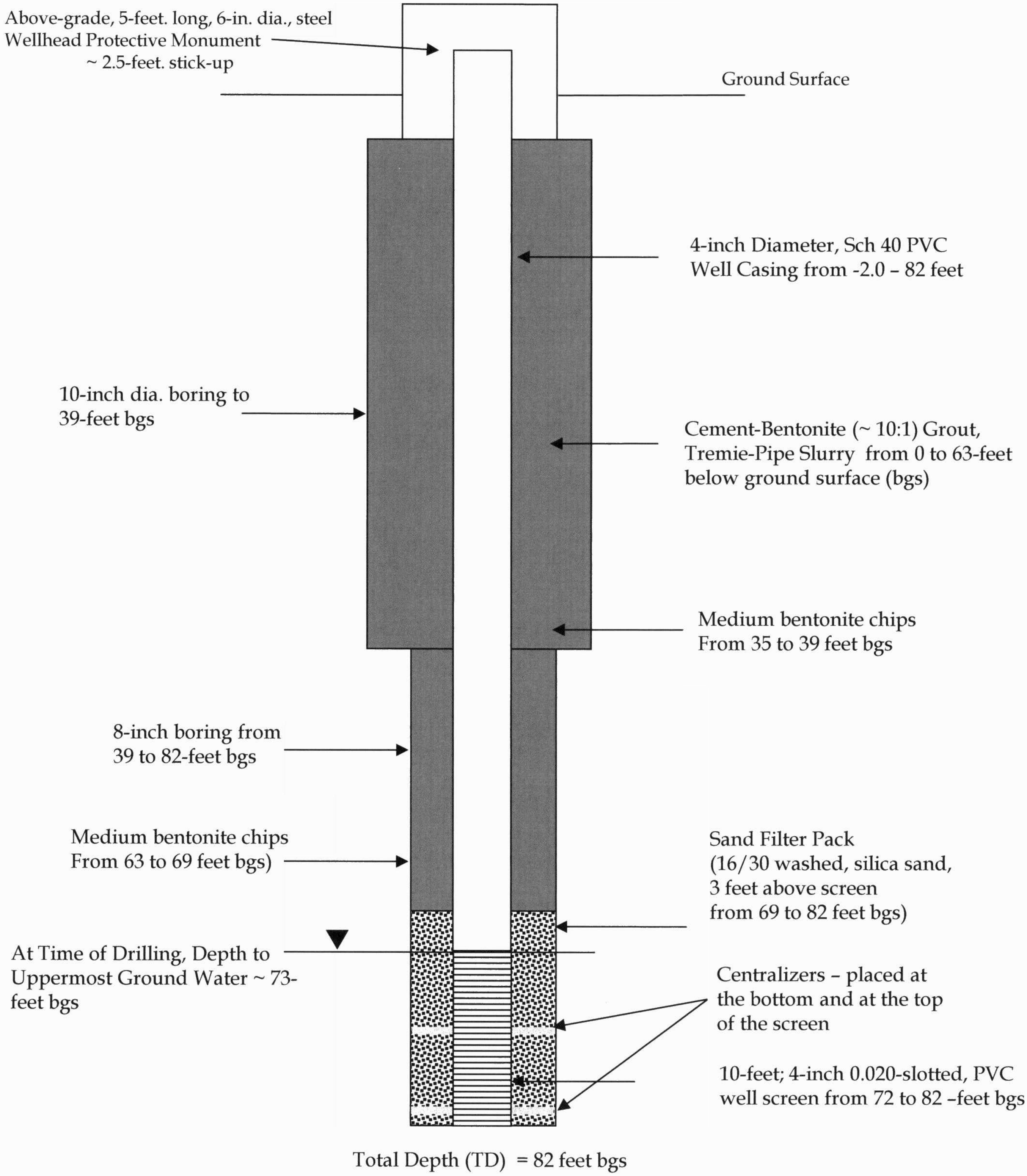


Stantec

ISPC– LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-3 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date



Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-4 Schematic

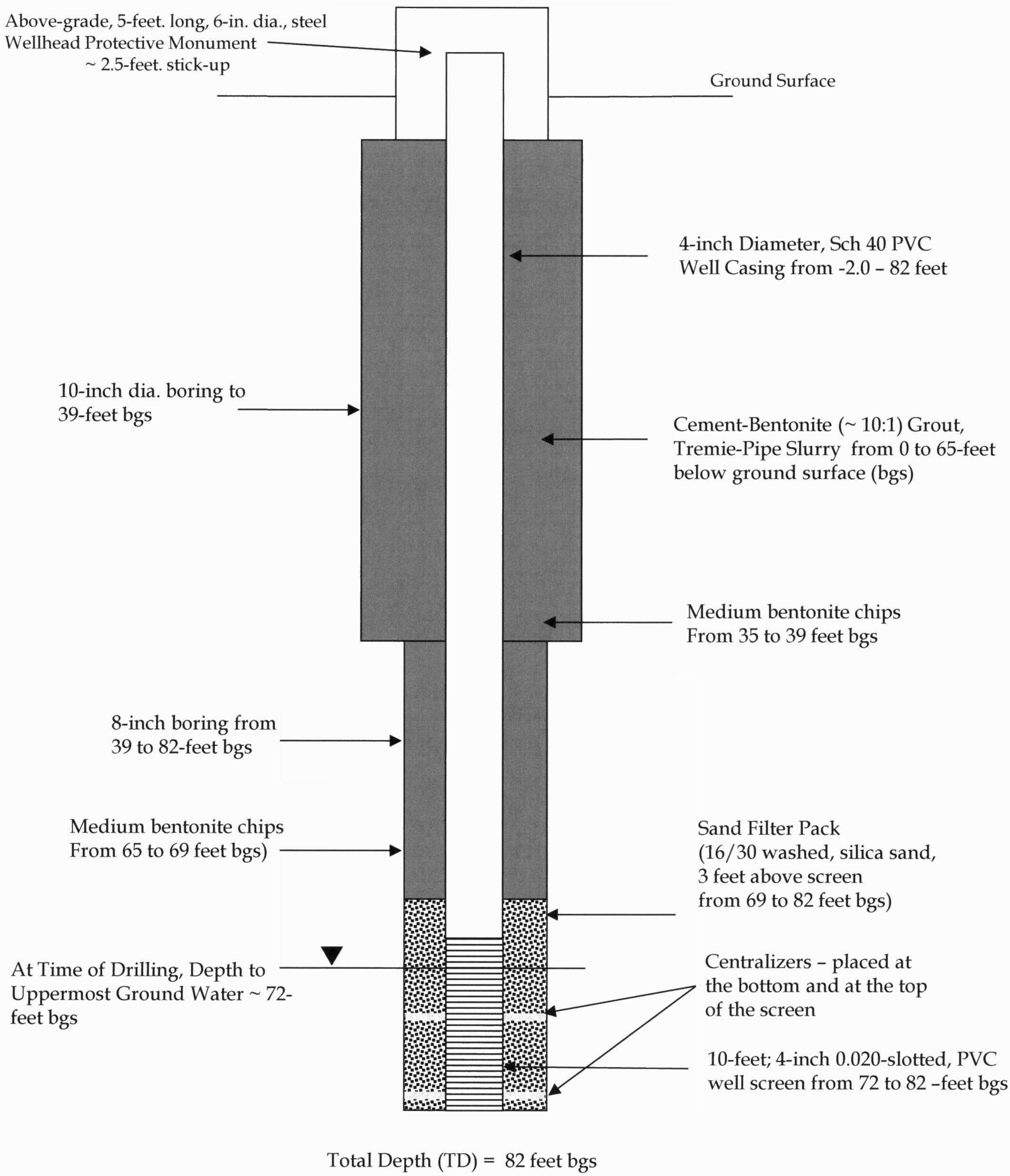
Date Drawn 9/1/15

Last Revision Date

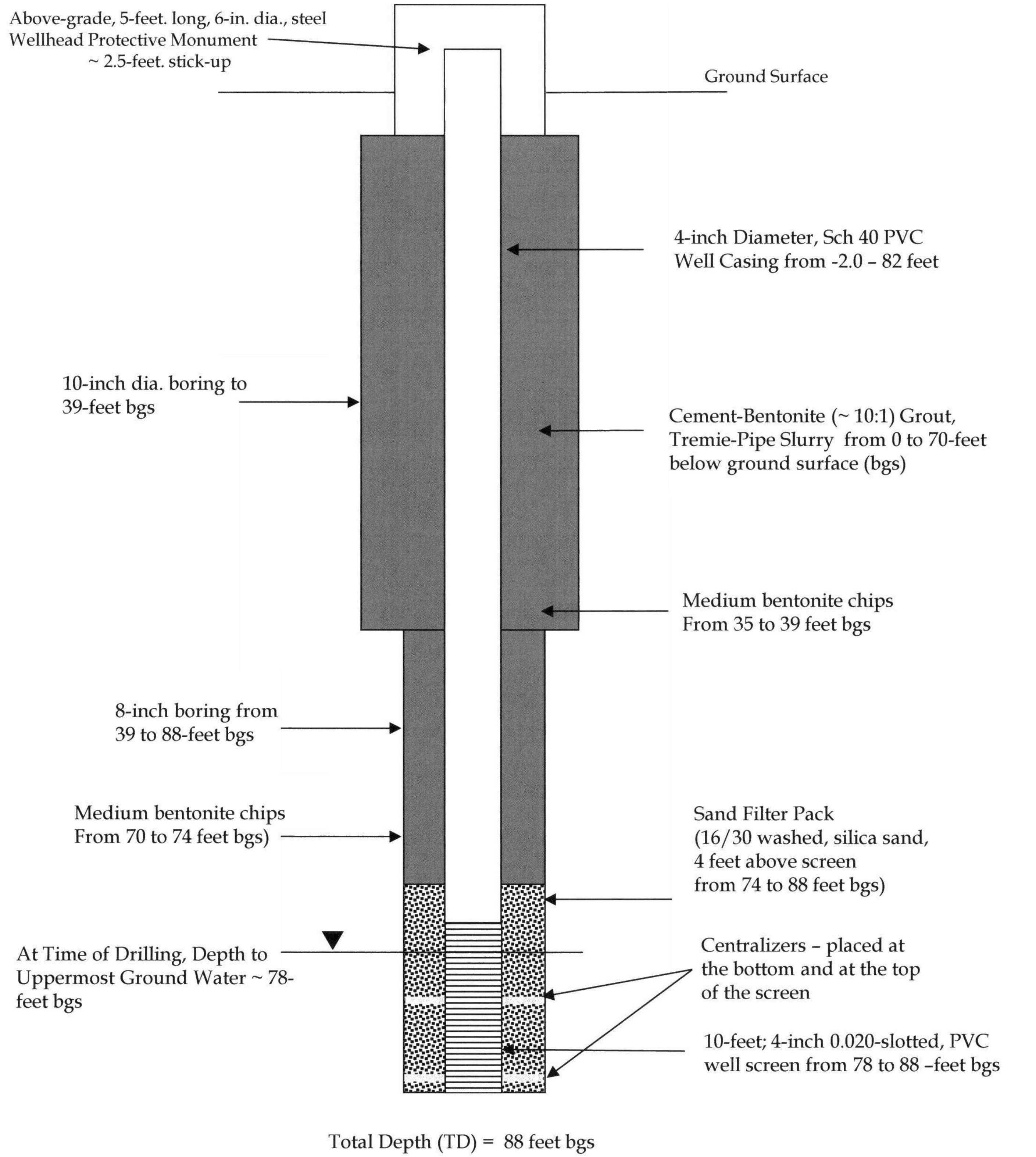
Design by

Drawn by TH

Scale



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH		
	CLW-5 Schematic		
			Date Drawn 9/1/15
	Design by	Drawn by TH	Scale	Last Revision Date

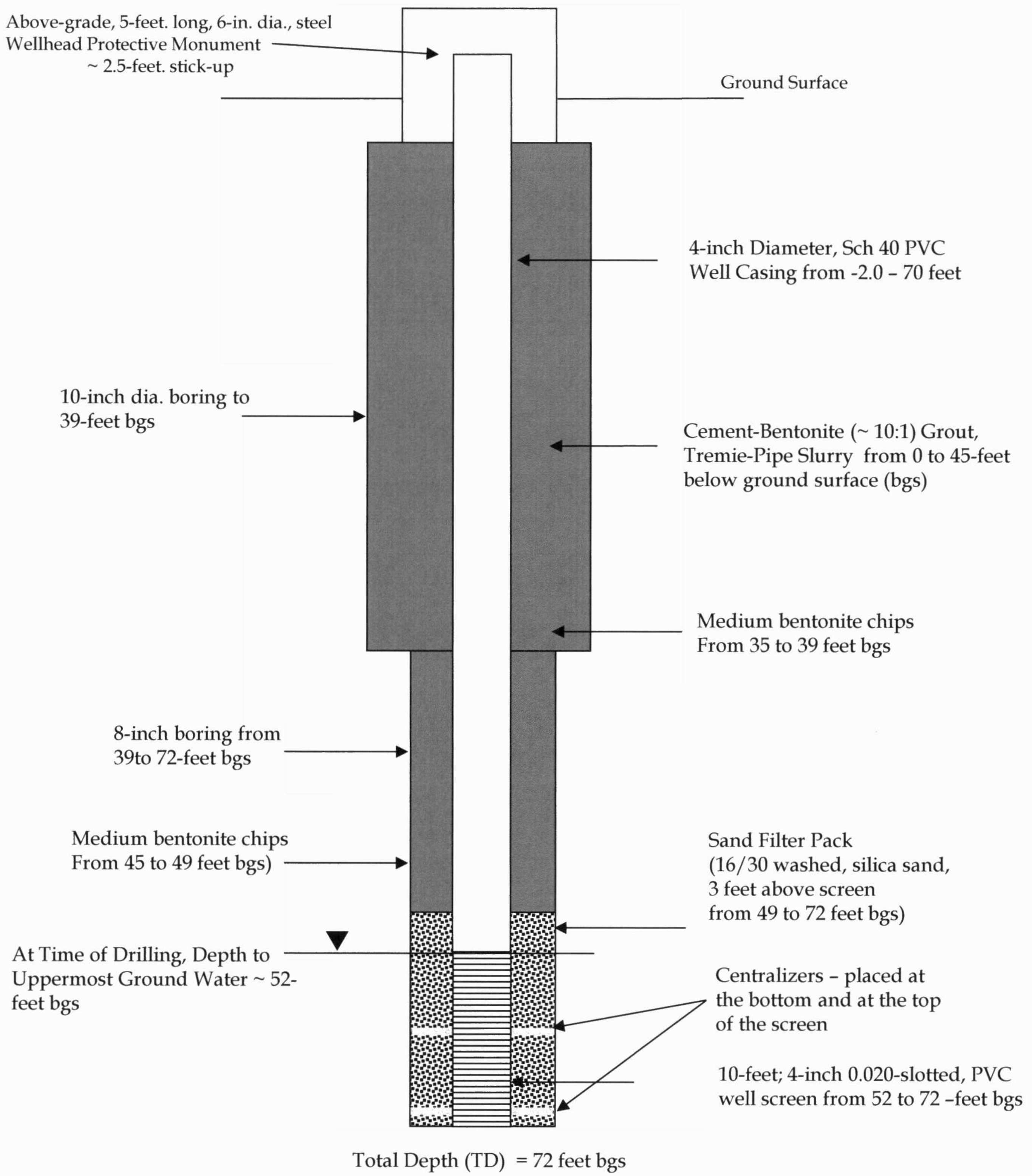


Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-6 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

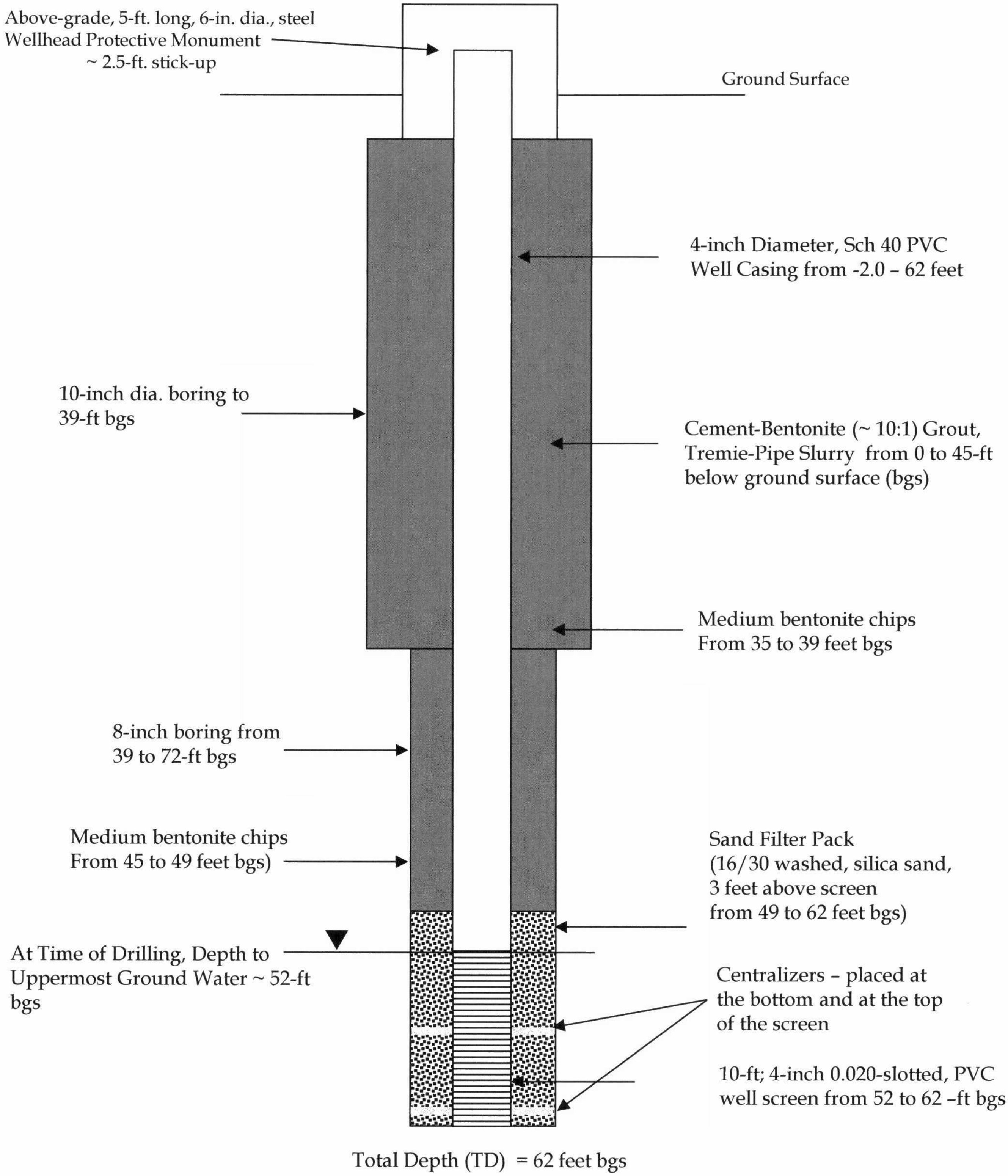


Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-7 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15	Last Revision Date

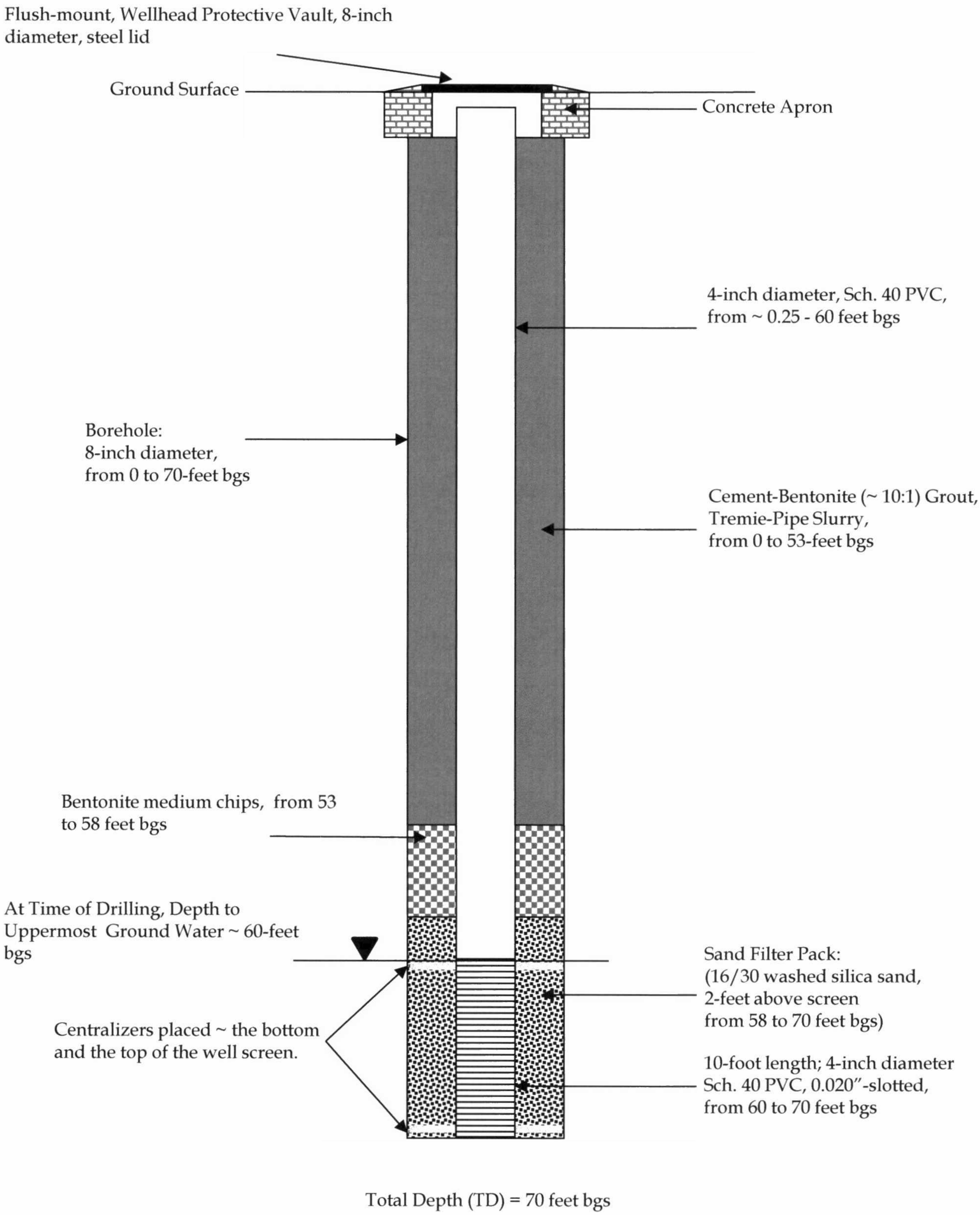


Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-8 Schematic

			Date Drawn 9/1/15
Design by	Drawn by TH	Scale	Last Revision Date

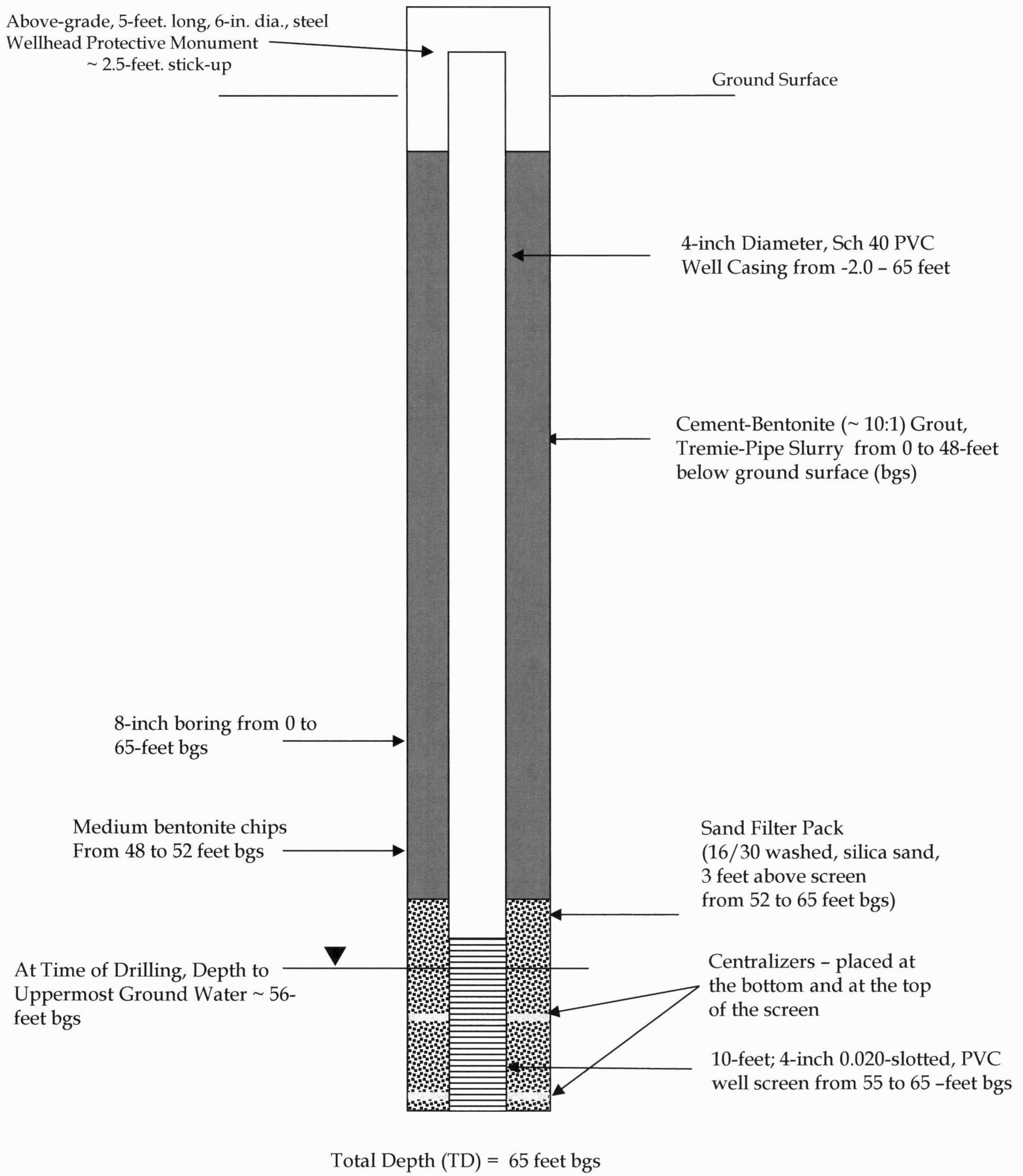


Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA
DELTA, UTAH

Well BAC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/31/15
			Last Revision Date



Stantec

ISPC– BOTTOM ASH AREA DELTA, UTAH			
BAC-2 Schematic			
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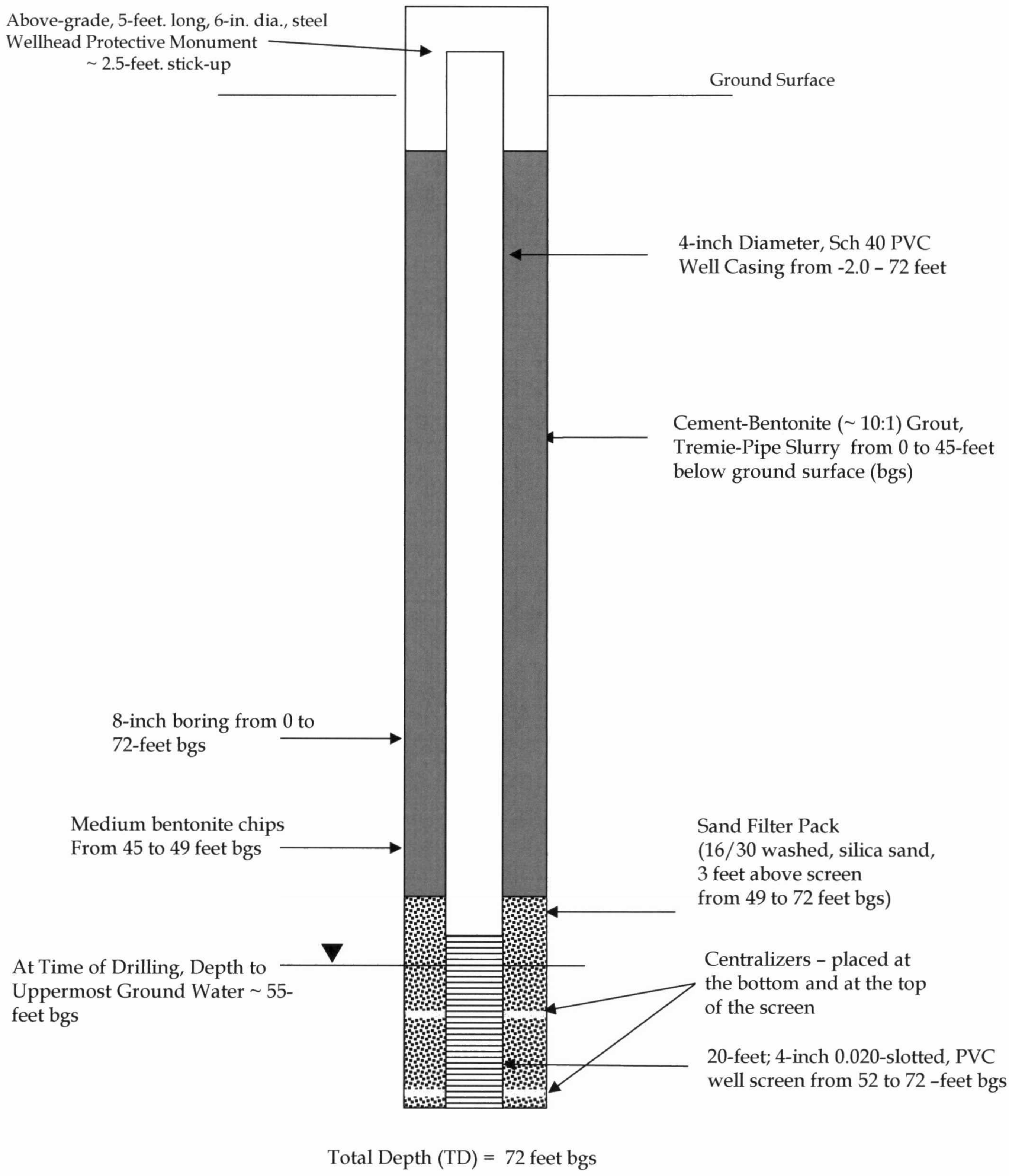
Design by	Drawn by TH	Scale	Last Revision Date



Stantec

ISPC– BOTTOM ASH AREA
DELTA, UTAH

BAC-3 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
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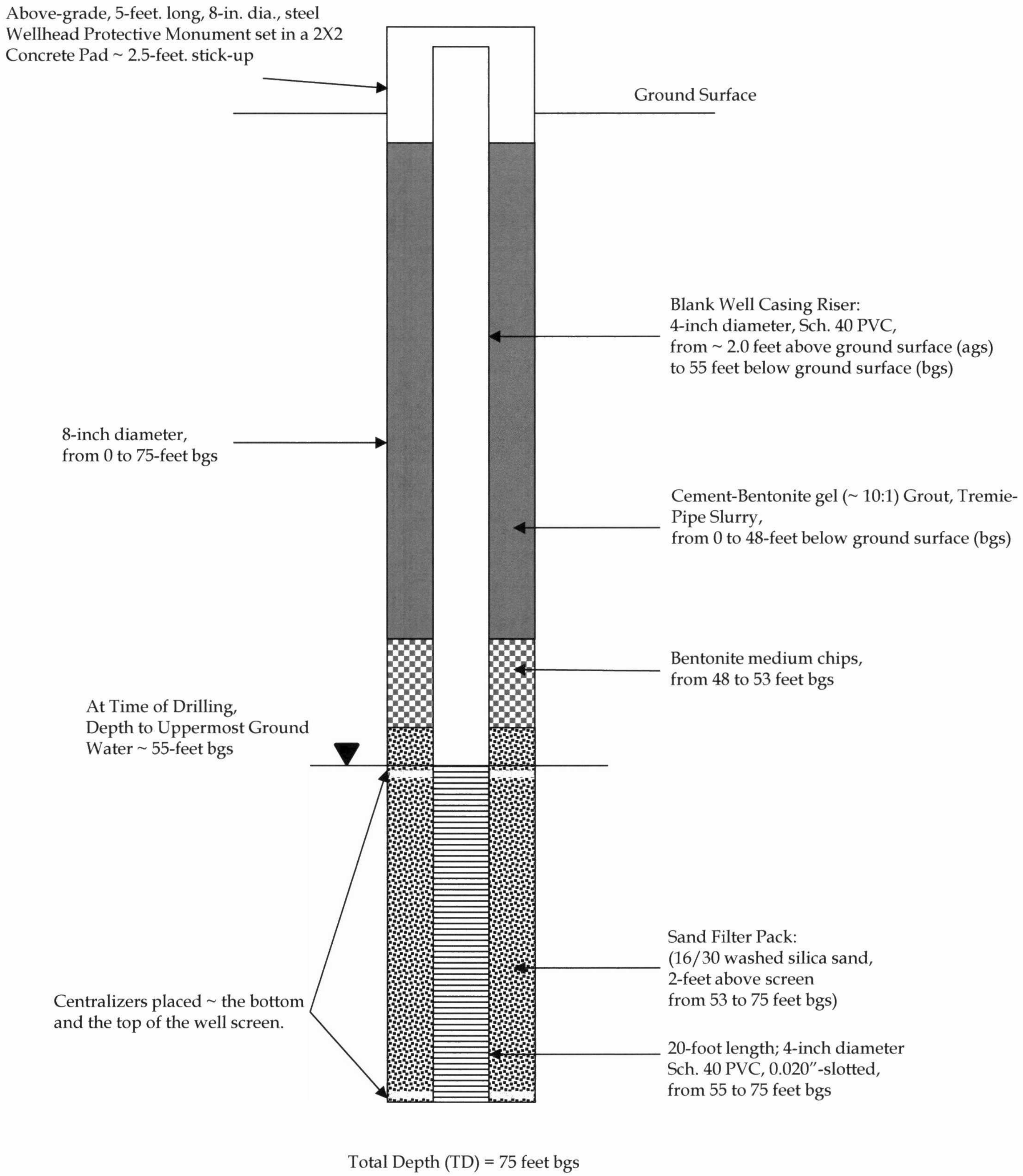

Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/10/15
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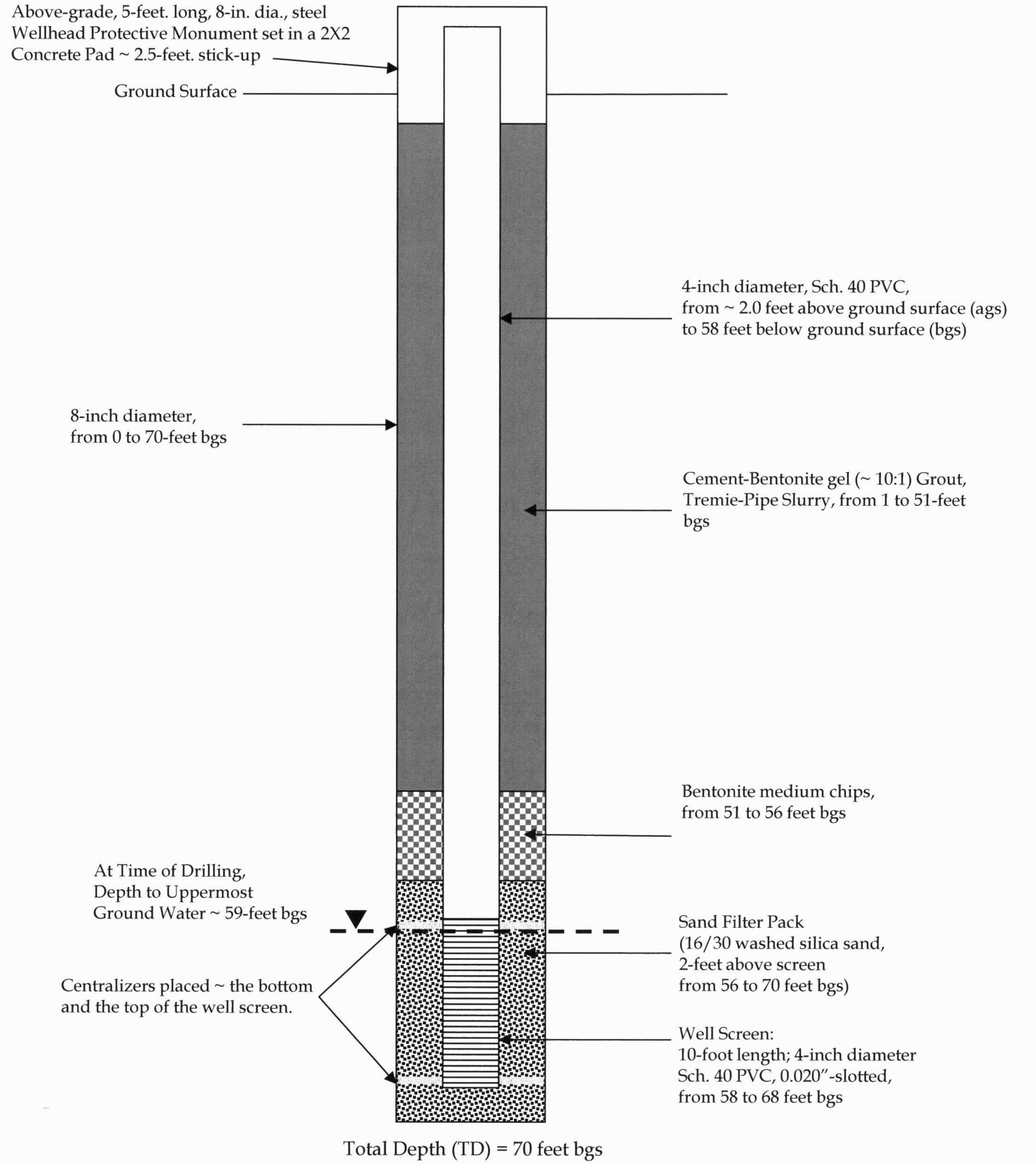
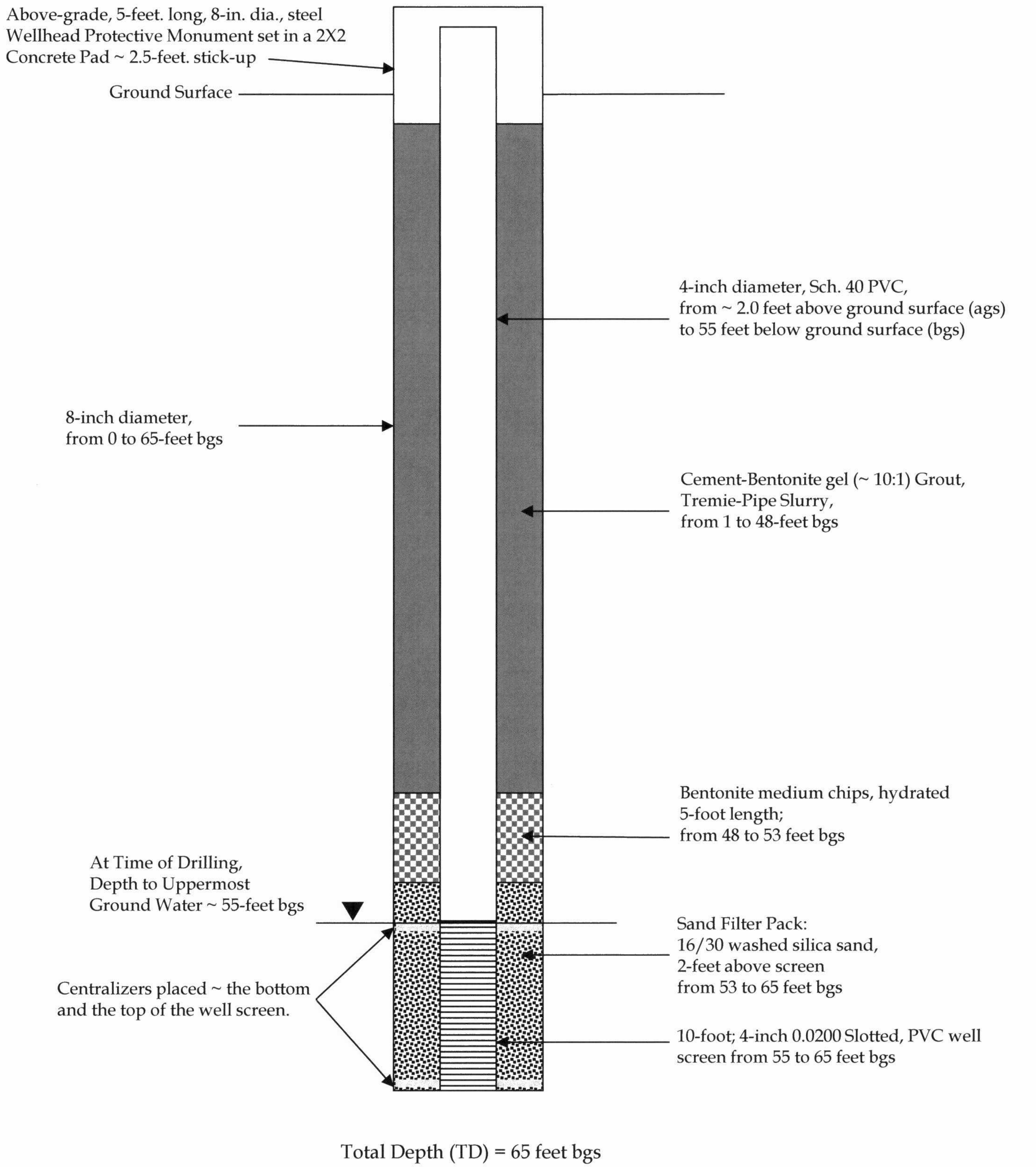


Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-5 Schematic

Date Drawn	8/09/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	



Stantec	IPSC – BOTTOM ASH BASIN AREA DELTA, UTAH		
	Well BAC-6 Schematic		
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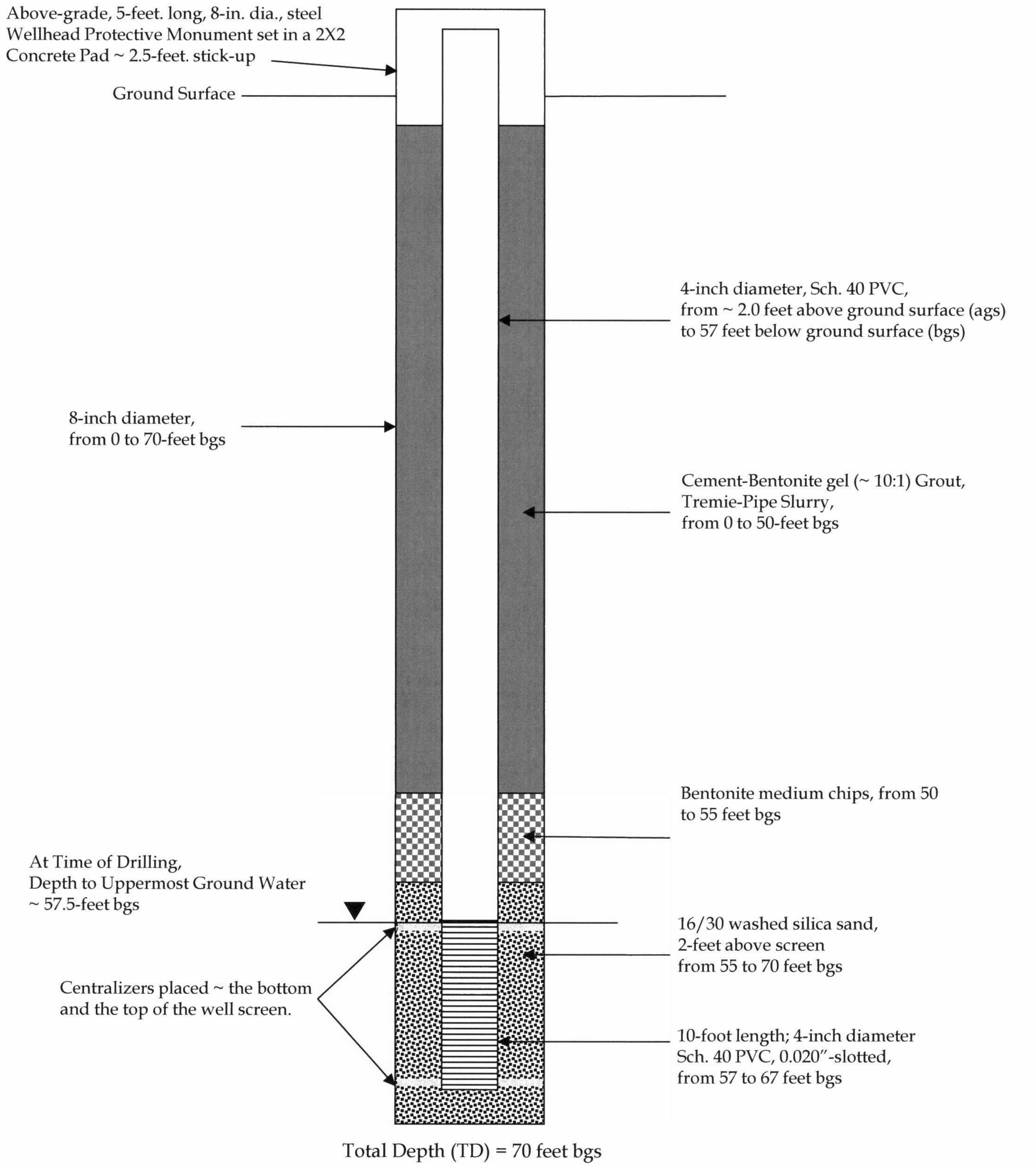


Stantec

IPSC – BOTTOM ASH BASIN AREA

DELTA, UTAH

Well BAC-7 Schematic

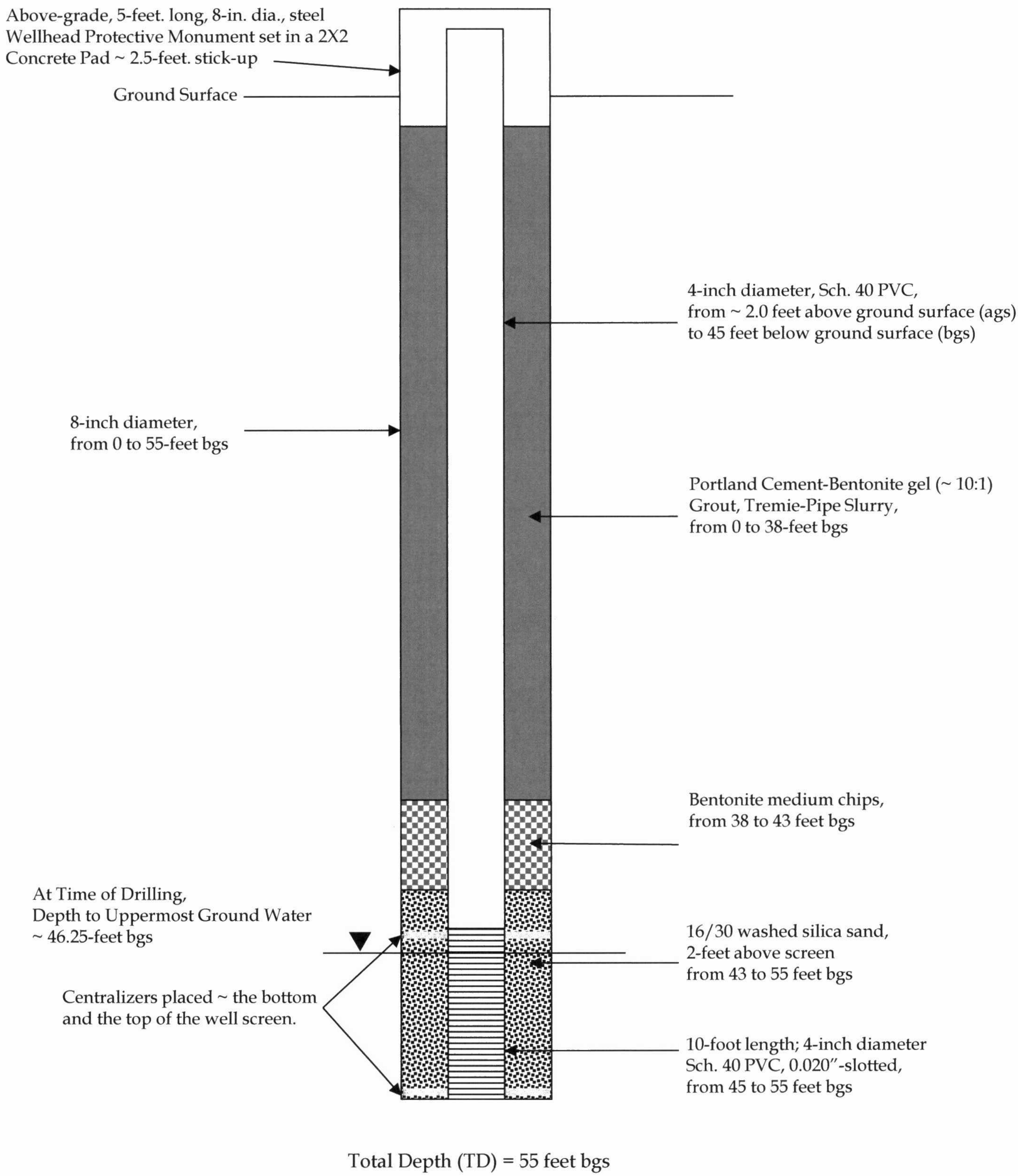
Date Drawn 8/07/15

Last Revision Date

Design by

Drawn by MS

Scale



Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/24/15
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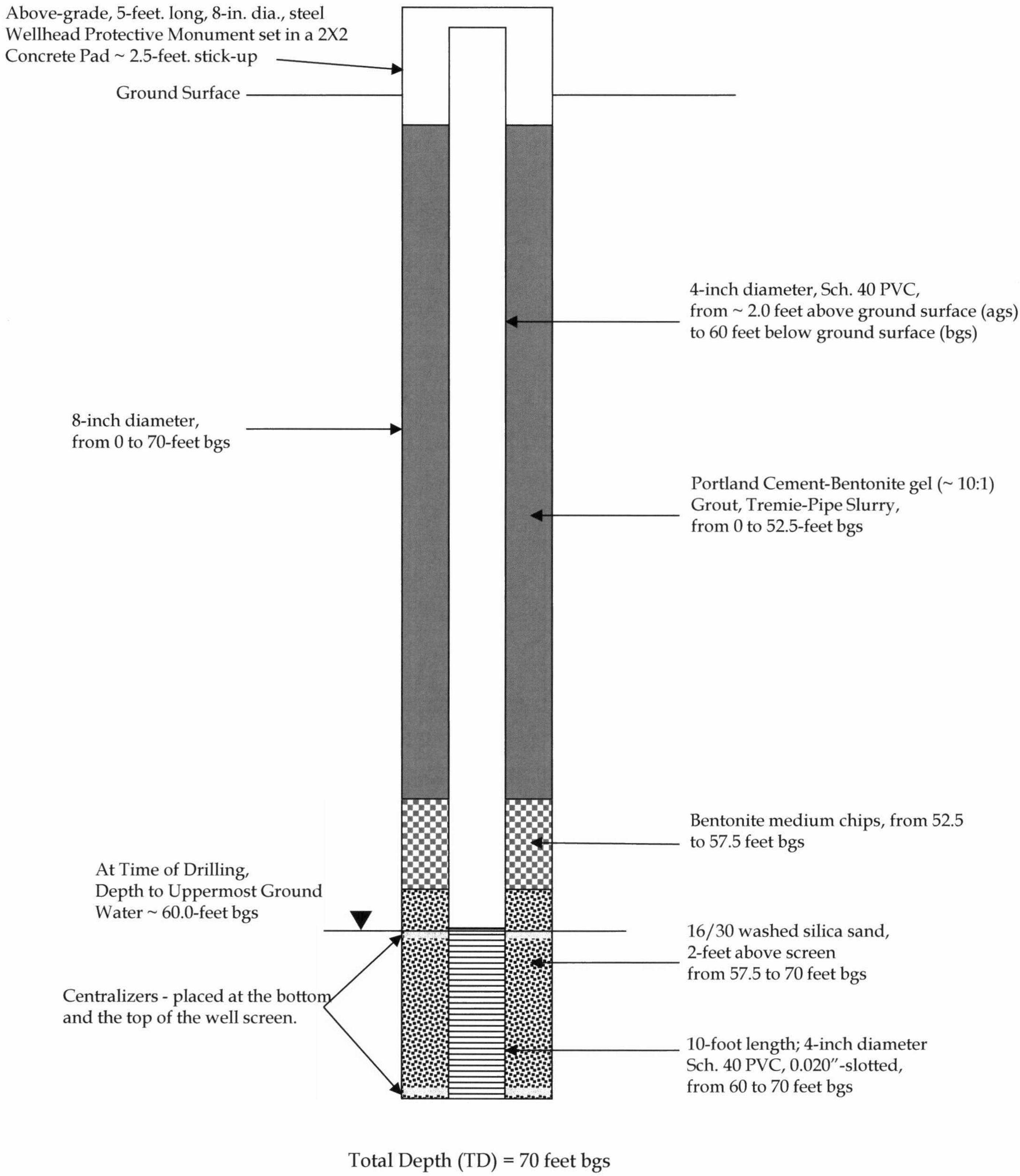

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	Well BA-U-2 Schematic		
			Date Drawn 7/25/15
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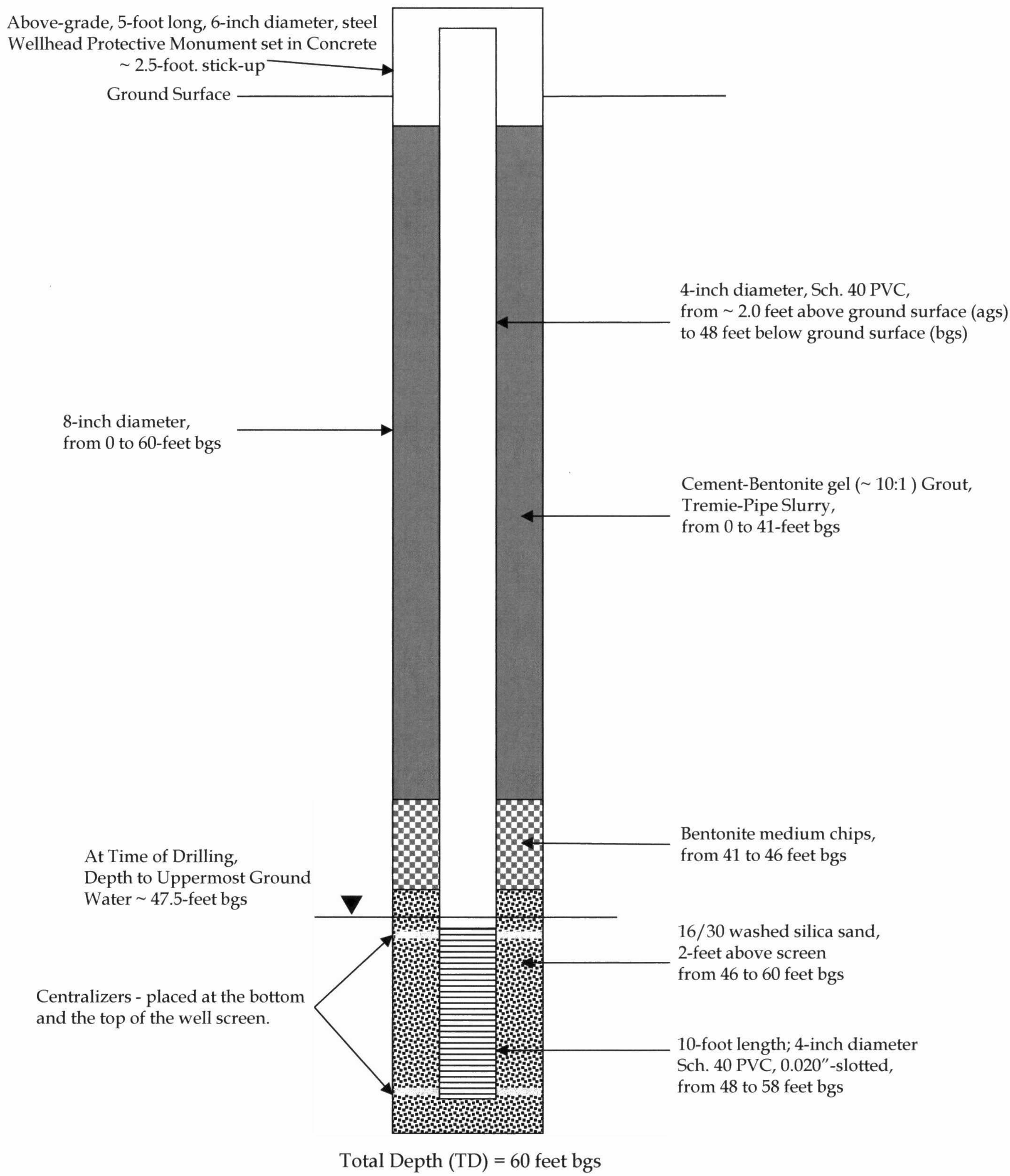

Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/26/15
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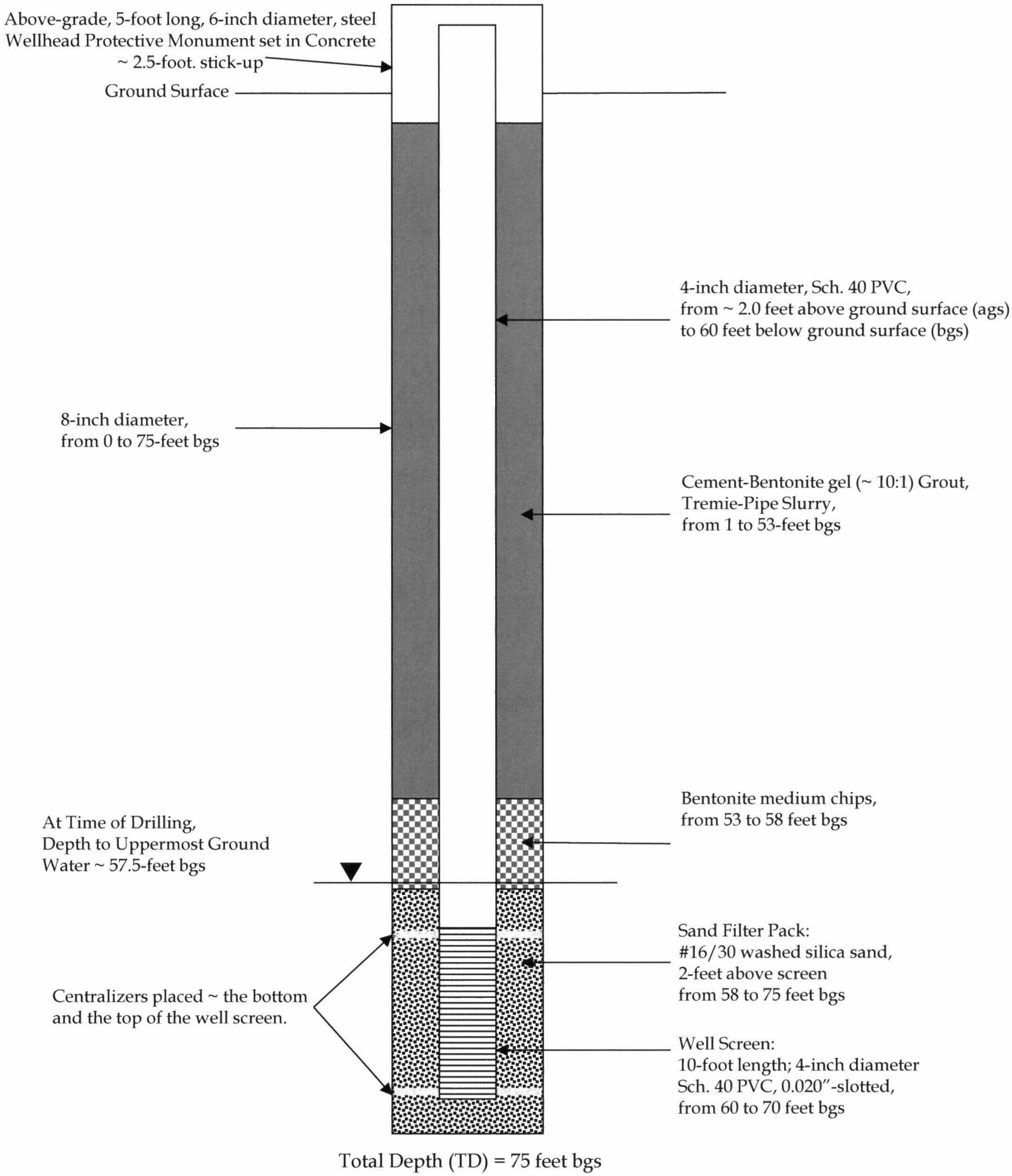

Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/27/15
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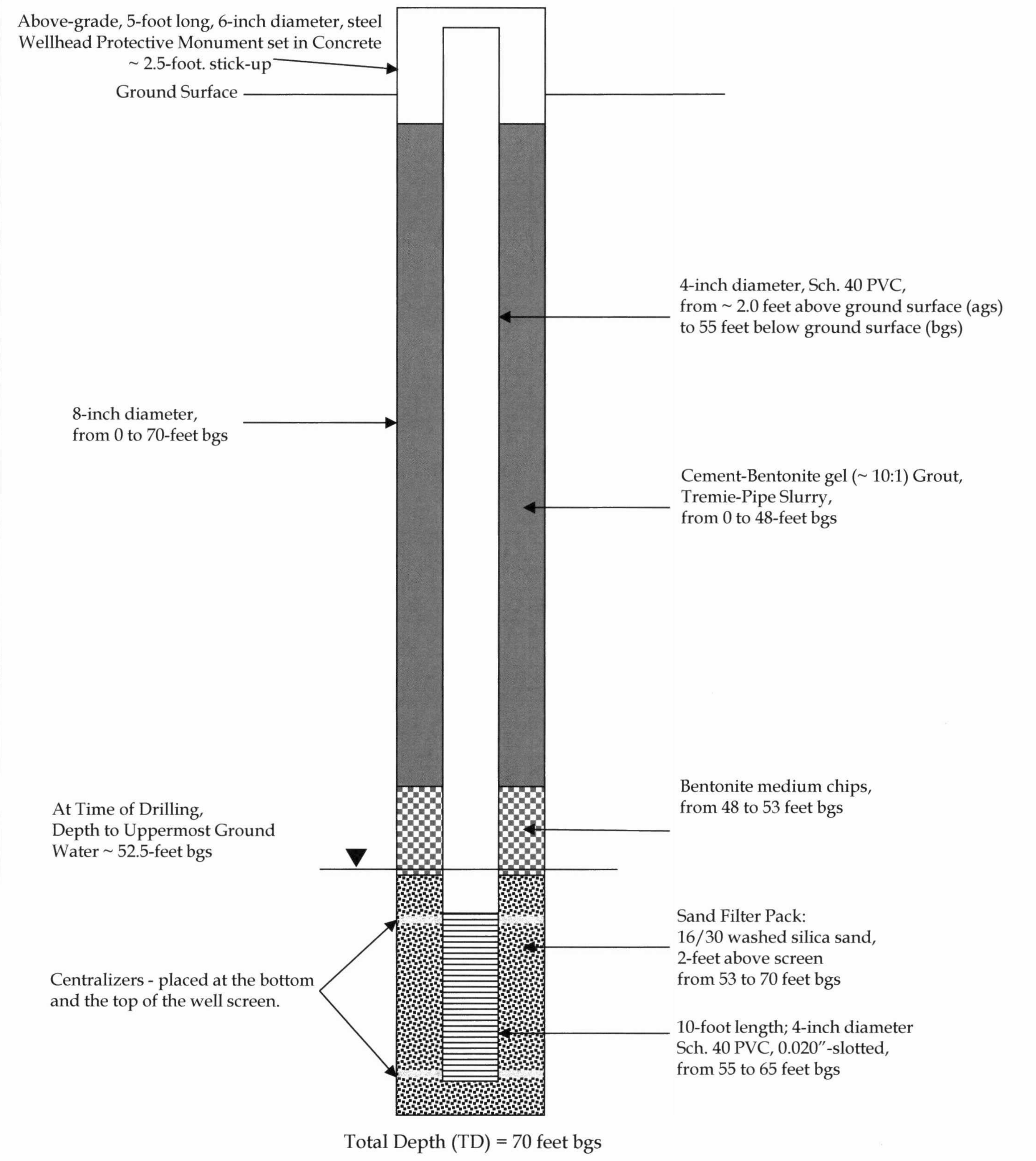

Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WWC-3 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/30/15
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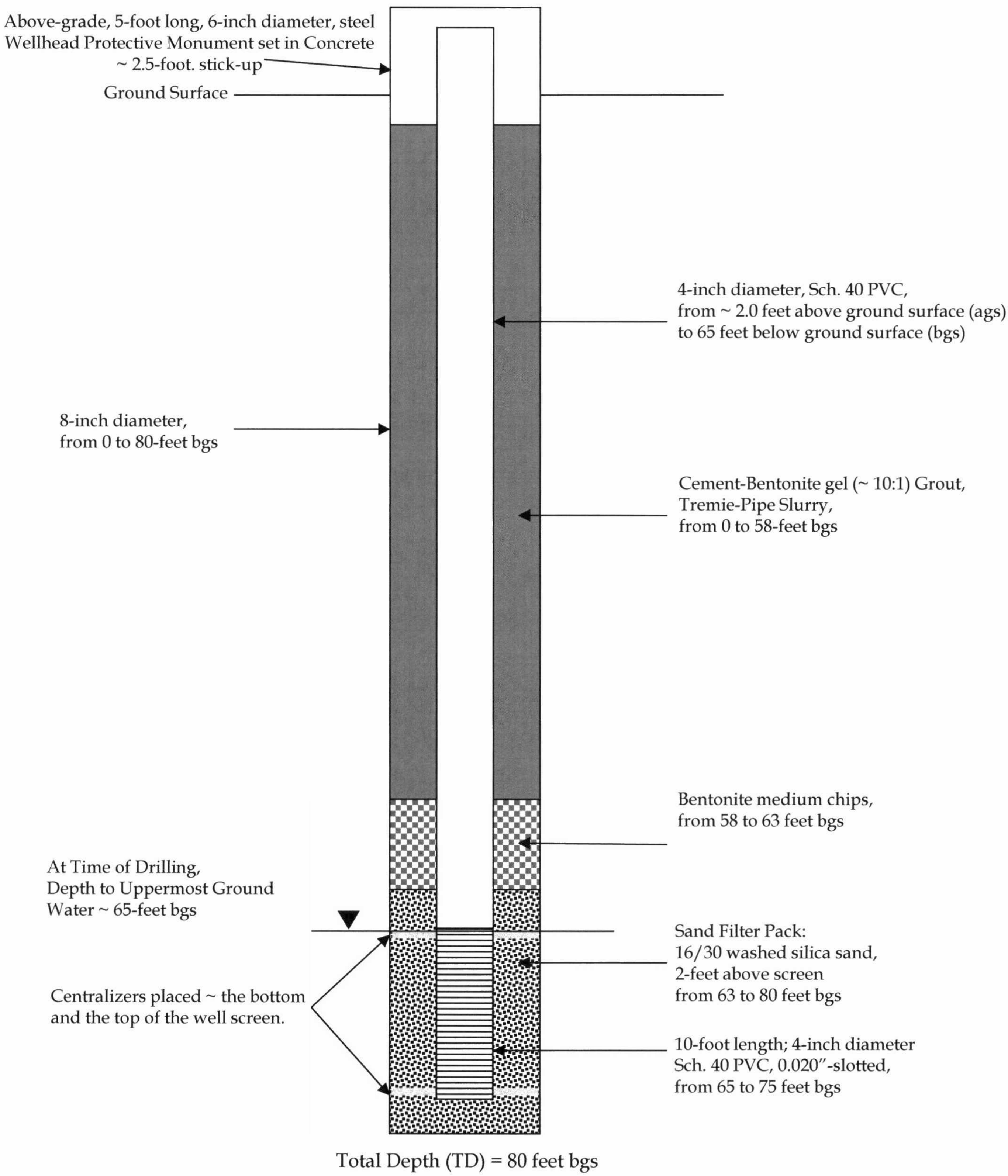
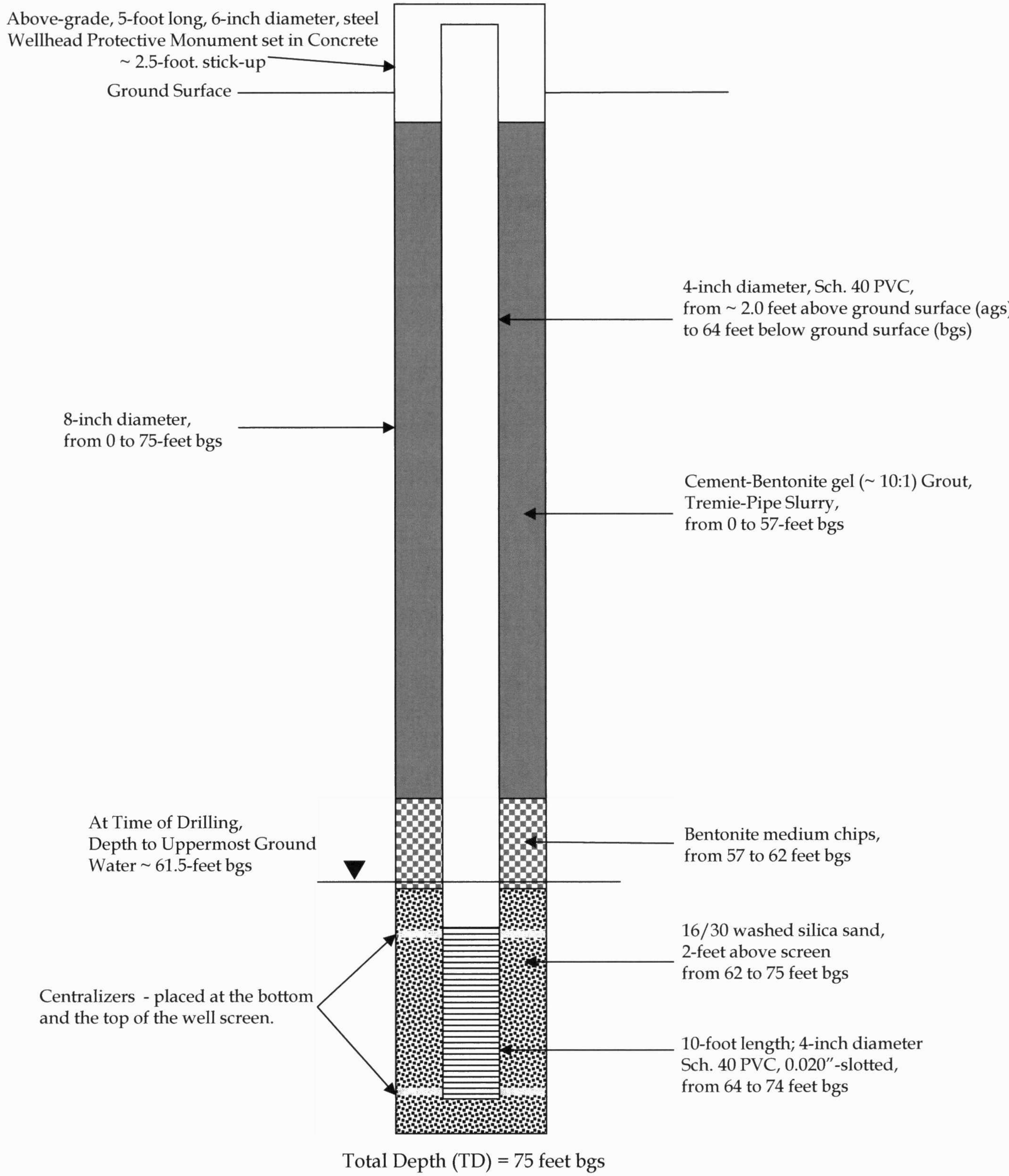


Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/29/15 / Last Revision Date



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WWC-5 Schematic

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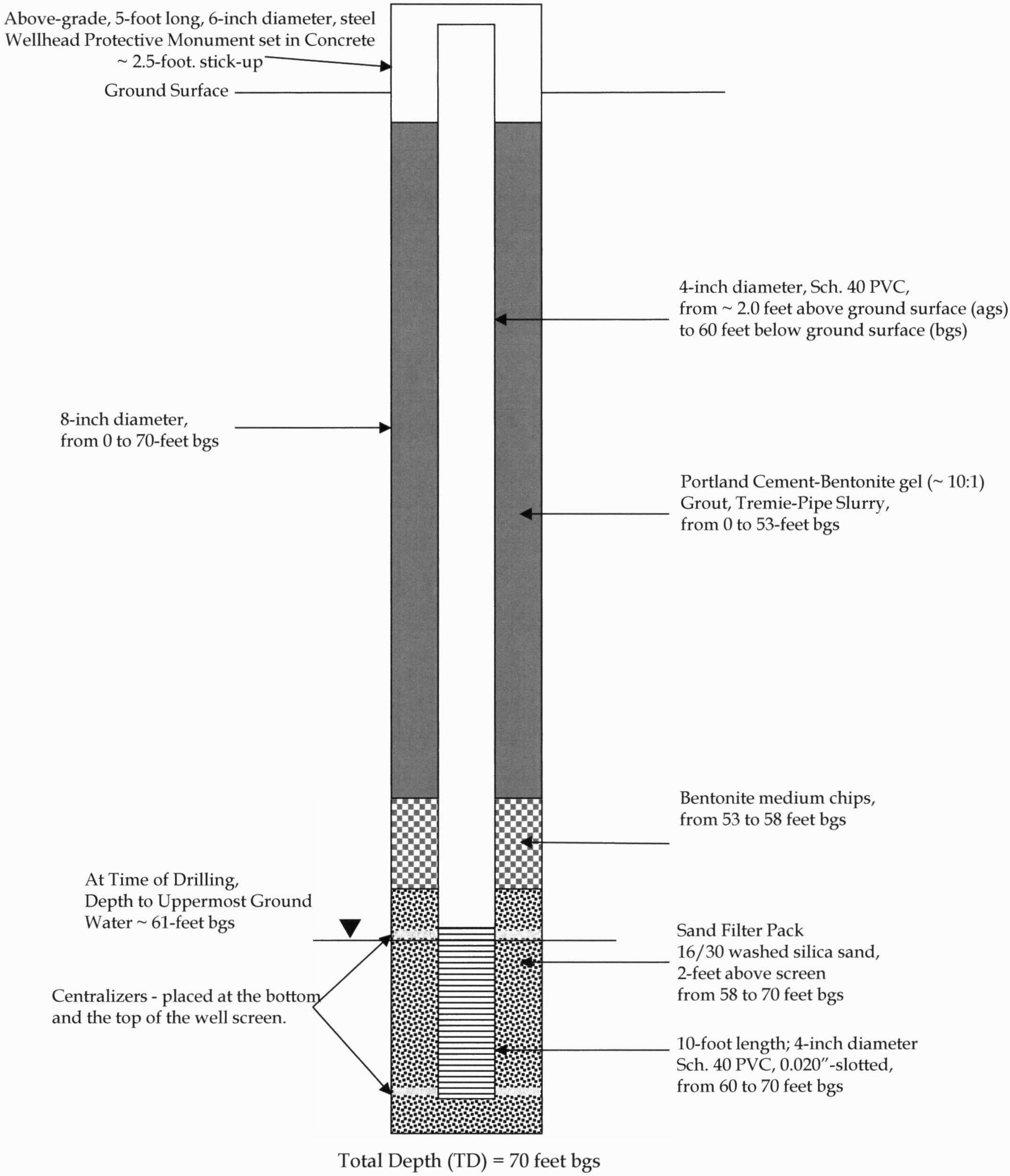

Stantec

IPSC – WASTEWATER HOLDING BASIN AREA DELTA, UTAH			
Well WW-U-1 Schematic			
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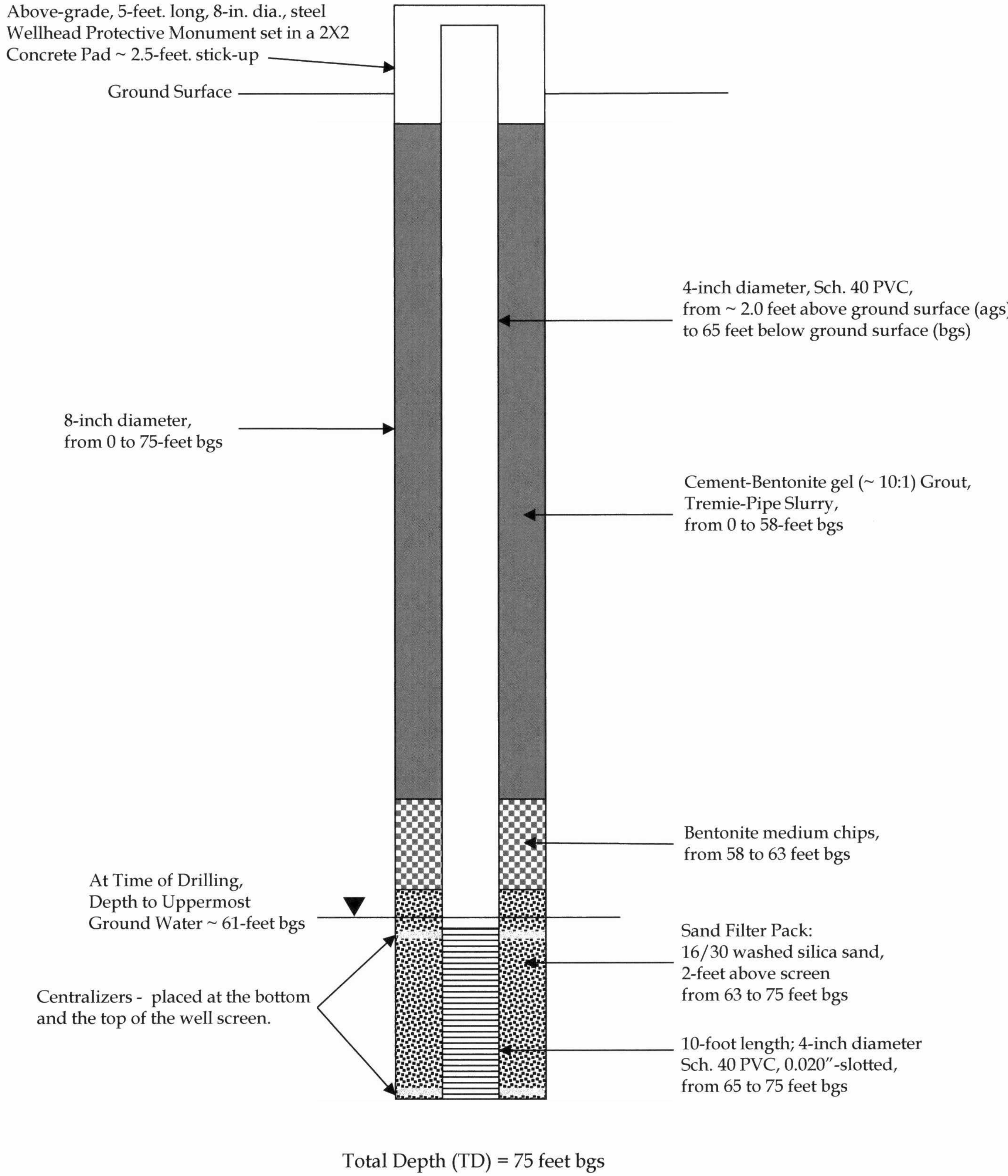
Design by	Drawn by MS	Scale	Last Revision Date



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WW-U-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/11/15	Last Revision Date

Boring Logs

IPSC

Delta, Utah

CLW-1

Interval (feet)	Drilling Method	Sample Description
		5/11/2015
0-3	10" Sonic	Brown fine grained Sand with gravel, dry
3-6	10" Sonic	Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-8	10" Sonic	Light Brown fine grained Sand
8-11.5	10" Sonic	Grayish white fine grained Sand, gravels present, rounded, dry
11.5-13.5	10" Sonic	Tan SILT with clay matrix, slightly moist
13.5-17	10" Sonic	Grayish Tan CLAY with small amount of silt present, slightly moist
17-23	10" Sonic	Grayish Tan SILT with fine grain sand present, trace amounts of clay, slightly moist
23-27	10" Sonic	Tannish Gray CLAY, denser, dry
27-32	10" Sonic	Tan CLAY, slightly moist
32-35	10" Sonic	Tan CLAY, denser material, slightly moist
		5/12/2015
35-48	10" Sonic to 40 feet	Tannish gray CLAY, moist
48-51	8" Sonic	Tannish gray CLAY, moist, softer
51-52	8" Sonic	Orangish, Brown, black fine grained Sand, moist
52-54	8" Sonic	Orangish, Brown , Red CLAY, slightly moist
54-56	8" Sonic	Orangish Brown CLAY with a fine grained sand matrix, slightly moist
56-62	8" Sonic	Light Brown fine grained Sand, saturated
62-63	8" Sonic	Light Brown CLAY, slightly moist
63-63.5	8" Sonic	Fine to medium grained Sand, slightly moist
63.5-64	8" Sonic	Light Brown CLAY, dry to slightly moist
64-65	8" Sonic	Light Brown fine grained Sand with clay matrix, moist

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-2

Interval (feet)	Drilling Method	Sample Description
		5/14/2015
0-8	10" Sonic	Brown fine grained Sand, clay present with gravel, dry
8-10	10" Sonic	Light to Dark Brown medium to course grained SAND, gravel present, dry
10-17	10" Sonic	Light Brown to Brown clayey SILT, slightly moist
17-25	10" Sonic	Light Brown Silty CLAY, moist
25-46	10" Sonic to 30 feet	Brown CLAY, slightly moist, from 40 to 45 feet transitioned to a Tan to Light Gray color
46-46.5	8" Sonic	Very moist to saturated zone, very soft clay , very sticky
46.5-50	8" Sonic	Light Gray CLAY, moist
50-51	8" Sonic	Tan to Light Gray with Orange zones, CLAY, slightly moist
51-51.5	8" Sonic	Very moist zone, CLAY
62	8" Sonic	Transitioning to a Orangish Red CLAY, Slightly moist
66-66.5	8" Sonic	Moist zone, transitioning from an Orangish Red to a Brown CLAY
66.5-73	8" Sonic	Reddish brown fine grained Sand with a clay matrix, very moist
73-80	8" Sonic	Brown fine gained Sand, trace amounts of clay, saturated.

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-3

Interval (feet)	Drilling Method	Drill Time	Sample Description
			5/13/2015
0-3	10" Sonic		Brown fine grained Sand , clay present with gravel, dry
3-6	10" Sonic		Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-11	10" Sonic		Grayish White fine grained Sand, gravels present, rounded, dry
11-13	10" Sonic		Brownish Orange SILT, with fine grained sand present, soft
13-16	10" Sonic		Tannish Gray SILT with a clay present, very moist, sticky
16-21	10" Sonic		Tannish Gray SILT with a clay matrix, very moist, sticky
21-24	10" Sonic		Light Gray CLAY, with silt present, very moist
24-33	10" Sonic		Light Gray to Orange CLAY, with silt present, slightly moist
32-40	10" Sonic to 40 feet		Tan CLAY, denser material, slightly moist
40-66	8" Sonic		Tan to Light Brown CLAY, slightly moist to Dry
63	8" Sonic		Transiting into a Darker Gray CLAY, Moist
66-72	8" Sonic		Very moist to saturated, clay very plastic, firm and sticky
72-73	8" Sonic		Dark Gray fine to medium grained Sand, saturated
73-74	8" Sonic		Dark Gray CLAY, sticky firm, very moist
74-80	8" Sonic		Dark Gray fine to medium grained Sand, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-4

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-2	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
2-5	10" Sonic	Light Brown fine grained Sands, dry
5-11	10" Sonic	Light Brown to gray fine grained SAND, dry to slightly moist
11-13	10" Sonic	Light Brown silty CLAY, slightly moist, good plasticity
13-14	10" Sonic	Light Brown fine grained SAND, with clays present, poor plasticity, dry
14-16	10" Sonic	Light Brown clayey SILT, dry
16-18	10" Sonic	Light Brown to Brown silty CLAY, slightly moist, good plasticity
18-21	10" Sonic	Light Brown to Gray silty CLAY, slightly moist to moist, good plasticity
21-24	10" Sonic	Brownish Gray CLAY, moist, high plascity
34-32	10" Sonic	Browninsh Gray CLAY, moist to very moist, high plasticity
32-53	10" Sonic to 39 feet	Brownish Gray CLAY, dencer, slightly moist,
		44 - thin layer of brownish orange fine grained sand
		47 - transitioning into a gray clay
		49 - thin layer of brownish orange fine grained sand
53-55	8" Sonic	Brownish Gray CLAY, dense, very plastic, slightly moist
55-73	8" Sonic	Brown CLAY, very plastic, slightly moist
73-82	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-5

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-4	10" Sonic	Gravels with medium to fine grand sands, moist
4-7.5	10" Sonic	Light Brown sitly CLAY, slightly moist, good plasticity
7.5-10	10" Sonic	Light Brown fine to medium grained SAND, dry
10-12	10" Sonic	Light Brown to Gray fine to medium grained SAND, gravels present, slightly moist
12-13	10" Sonic	Light Brown clayey SILT, slightly moist,
13-15	10" Sonic	Brown fine to medium grained SAND, wht clays and silts, slightly moist
		7/27/2015
15-22	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
22-32	10" Sonic	Light Brown CLAY, moistgood plasticity
32-38	10" Sonic	Brown CLAY, slightly moist, high plasticity
38-40	10" Sonic to 39 feet	Light Gray CLAY, slightly moist, hight plasticity
40-44	8" Sonic	Light Brown to Brown CLAY, slightly moist, high plasticity
44-52	8" Sonic	Light Gray CLAY, hight plasticity, slighly moist
52-53	8" Sonic	Brown CLAY, high plasticity, slightly moist
53-55	8" Sonic	Gray CLAY, high plasticity, slightly moist
55-72	8" Sonic	Gray CLAY, high plasticity, moist
72-74	8" Sonic	Gray fine grained SAND, with clay matrix, moist to saturated
74-75	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
75-78	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated
78-80	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
80-82	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-6

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown silty fine grained SAND, dry
5-7	10" Sonic	Light Brown fine grained sandy SILT, dry
7-12	10" Sonic	Light Brown fine to medium grained SAND, dry
12-15	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
15-21	10" Sonic	Light Brown to Brown clayey SILT, slightly moist, poor plasticity
21-22	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
21-23		Light Brown to Brown clayey SILT, slightly moist, poor plasticity
23-32	10" Sonic	Light Brown CLAY, moist, sticky, high plasticity
32-38	10" Sonic	Light Brown to Gray CLAY, moist, high plasticity
38-47	10" Sonic	Light Gray to Gray CLAY, slightly moist, high plasticity
47-55	10" Sonic to 39 feet	Transitioned to a Brownish gray CLAY, high plasticity, slight moist
55-72	8" Sonic	Brown CLAY, high plasticity, slightly moist
		58 - 58.5 very moist to saturated, 59 - slightly moist
72-78	8" Sonic	Gray CLAY, very moist, high plasticity
78-82	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
82-84	8" Sonic	Gray CLAY, high plasticity, very moist
84-85	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
85-88	8" Sonic	Gray CLAY, high plasticity, very moist

TD = 88; PVC 4-inch screen from 78 to 88; PVC 4-inch riser from -2.5 to 78

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-7

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-8	10" Sonic	Light Brown fine grained Sands with silts and gravel, angular, Dry
8-12	10" Sonic	Light Brown fine grained Sands with silts and clay, No gravel, Dry
12-15	10" Sonic	Tan SILT with a clay matrix, Dry
15-17	10" Sonic	Light Brown to Gray CLAY, medium plasticity, silty present, Dry
17-22	10" Sonic	Light Brown Clayey SILT, slightly moist
22-24	10" Sonic	Light Brown to Grayish silty CLAY, Dry
24-32	10" Sonic	Light Brown to Grayish CLAY, Brown silts and fine grained sands present, , Dry
32-40	10" Sonic to 39 feet	Light Brown CLAY, slightly moist, became denser at 35 feet
40-43	8" Sonic	Light Brown to Grayish CLAY, very dense, slightly moist
43-48	8" Sonic	Gray CLAY, slightly moist, some layers of a brown fine grained sand present every 3 to 4 inches alone the core
48-50	8" Sonic	Gray CLAY, slightly moist, some Iron Oxide present
50-51.5	8" Sonic	Brown fine to medium grained SANDS, saturated
51.5-58	8" Sonic	Brown CLAY, moist to slightly moist
58-58.5	8" Sonic	Brown fine grained SANDS, with a clay matrix, saturated
58.5-61	8" Sonic	Brown CLAY, moist to slightly moist
61-68	8" Sonic	Brown fine to medium grained SANDS, saturated
68-70	8" Sonic	Brown CLAY, moist to slightly moist
70-72	8" Sonic	Brown fine to medium grained SANDS, saturated

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-8

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown fine grained Sands, slightly moist
5-7	10" Sonic	Tannish white fine grained Sand, with smooth, rounded pebbles, slightly moist
7-10	10" Sonic	Tannish white silty, fine grained Sand, slightly moist
10-13	10" Sonic	Tan SILT with a clay matrix, slightly most, slightly plastic
13-15	10" Sonic	Tan Clayey SILT, dry, plastic
15-18	10" Sonic	Light Brown to tan silty CLAY, slightly moist, good plasticity
18-24	10" Sonic	Light Brown CLAY with silts present, slightly moist, good plasticity
24-32	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
32-37	10" Sonic	Brown CLAY, dence, dry to slihgtly moist, very plastic
37-52	10" Sonic to 39 feet	Transitioned fomrthe Brown CLAY to a Gray CLAY, with interbeds of brown fine gran sand layers, highly plastic, slihglty moist
52-62	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 62; PVC 4-inch screen from 52 to 62; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CL-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/22/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	SAND with silt:
2-2.5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
2.5-5	8" Sonic	SM	Silty SAND:
5-6	8" Sonic	CL	CLAY:
6-7.5	8" Sonic	SM/ML	Silty SAND/Sandy SILT with clay:
7.5-10	8" Sonic	CH	CLAY:
10-11	8" Sonic		CLAY:
11-12.5	8" Sonic		CLAY:
12.5-13.5	8" Sonic		CLAY:
13.5-15	8" Sonic	ML	Sandy SILT:
15-16.5	8" Sonic	SP/SM	SAND with silt:
16.5-17.5	8" Sonic	SM	Silty SAND:
17.5-20	8" Sonic	SP	SAND:
20-21	8" Sonic		SAND:
21-22	8" Sonic	ML	Sandy SILT:
22-23	8" Sonic	SP	SAND:
23-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26	8" Sonic	ML	Sandy SILT:
26-28	8" Sonic		Sandy SILT:
28-30	8" Sonic		SILT with clay:
30-32	8" Sonic		Sandy SILT:
32-34	8" Sonic	SP	SAND:
34-35	8" Sonic	ML	Sandy SILT with clay:
35-40	8" Sonic	CL	CLAY:
40-42	8" Sonic	ML	SILT with clay:
42-45	8" Sonic	CH	CLAY:
45-55	8" Sonic		CLAY:
55-65	8" Sonic		CLAY:
7/23/2015			
65-66.5	8" Sonic	CH	Sandy CLAY:
66.5-67.5	8" Sonic	SP/SM	SAND with silt:
67.5-72.5	8" Sonic		SAND with silt:
72.5-73.5	8" Sonic	SP	SAND:
73.5-75	8" Sonic	SC	Clayey SAND:
75-76.5	8" Sonic	SW	SAND:
76.5-79	8" Sonic	SP	SAND:
79-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 68 to 78; PVC 4-inch riser from -2.5 to 68

Drilling Method: Guspech GS24-300RS 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

CLU-2

Interval (feet)	Drilling Method	Sample Description
		7/22/2015
0-6	8" Sonic	Light Brown fine grained SAND with silt, dry
6-7.5	8" Sonic	Light Brown to Tan CLAY with silt, slightly moist
7.5-13	8" Sonic	Light Brown fine grained SAND with silt, dry
13-16	8" Sonic	Brown fine grained SAND with clayey matrix, slightly moist, some plasticity
16-24	8" Sonic	Light Brown fine grained SAND, dry
24-35	8" Sonic	Light Brown clayey SILT, dry
35-44	8" Sonic	Light Brown Silty CLAY, dry, good plasticity
44-48	8" Sonic	Gray Clayey SILT, dry, slightly plastic
48-49	8" Sonic	Brownish Orange CLAY, with a silty matrix, dry, good plasticity
49-60	8" Sonic	Brownish Orange CLAY, slightly moist
	8" Sonic	53-55 soil becomes slightly moist and Iron Oxide present
	8" Sonic	57-61 soil is dry
61-67	8" Sonic	Brownish Gray CLAY, at 61 feet very moist, very plastic
67-70	8" Sonic	Gray CLAY, moist, very plastic
70-75	8" Sonic	Gray fine to medium grained SAND, saturated, nonplastic
75-77	8" Sonic	Greenish Gray to Brown Clay fine grained SAND with a CLAY matrix, saturated
77-80	8" Sonic	Brownish Gray, fine to medium grained SAND, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Thomas Hedrick

Boring Logs
ISPC
Delta, Utah

BAC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/31/2015			
0-0.75	8" Sonic	Concrete	Surface - concrete soil mixture
0.75-2.5	8" Sonic	SM	Silty SAND:
2.5-3.25	8" Sonic		Silty SAND:
3.25-5	8" Sonic	SP/SM	SAND with silt:
5-12.5	8" Sonic		SAND with silt:
12.5-13.5	8" Sonic		SAND with silt:
13.5-14.5	8" Sonic	ML	Sandy SILT:
14.5-15	8" Sonic		Sandy SILT:
15-17.5	8" Sonic	SP	SAND:
17.5-19	8" Sonic	SP/SW	SAND:
19-20	8" Sonic	SP/SM	SAND with silt:
20-21.5	8" Sonic	SP	SAND:
21.5-22.5	8" Sonic		Sandy SILT:
22.5-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26.75	8" Sonic	SM	Silty SAND:
26.75-27.5	8" Sonic	SP	SAND:
27.5-28.5	8" Sonic		SAND:
28.5-30	8" Sonic	SM	Silty SAND:
30-31.5	8" Sonic	SP	SAND:
31.5-32.25	8" Sonic	SM	Silty SAND:
32.25-33.75	8" Sonic	SP/SM	SAND with silt:
33.75-35	8" Sonic	SM	Silty SAND:
35-36	8" Sonic	SP/SM	SAND with silt:
36-37.5	8" Sonic	SM	Silty SAND:
37.5-38	8" Sonic	SP/SM	SAND with silt:
38-38.5	8" Sonic	SM	Silty SAND:
38.5-40	8" Sonic	ML	Sandy SILT:
40-42.5	8" Sonic	SC	Clayey SAND:
42.5-43.5	8" Sonic	CL	Sandy CLAY:
43.5-44.5	8" Sonic		Sandy CLAY:
44.5-45	8" Sonic		Sandy CLAY:
45-46	8" Sonic		Sandy CLAY:
46-47	8" Sonic		Sandy CLAY:
47-47.75	8" Sonic	SW	SAND:
47.75-48.5	8" Sonic	CH	Sandy CLAY:
48.5-50	8" Sonic		Sandy CLAY:
50-51.5	8" Sonic		CLAY:
51.5-53.5	8" Sonic		Sandy CLAY:
53.5-56	8" Sonic		CLAY:
56-57.5	8" Sonic		Sandy CLAY:
57.5-58	8" Sonic	SC	Clayey SAND:
58-59.5	8" Sonic	CH	CLAY:
59.5-60	8" Sonic	SC	Clayey SAND:
60-64.5	8" Sonic	SM	Silty SAND with clay:
64.5-65.5	8" Sonic	SC	Clayey SAND:
65.5-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic	SW	SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from 0 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

BAC-2

Interval (feet)	Drilling Method	Sample Description
		7/29/2015
0-6	8" Sonic	Light Brown fine grained Sand, gravels, dry
6-12	8" Sonic	Light Brown fine grained SAND, moist
12-18	8" Sonic	Light Brown fine to medium grained sand, dry
18-23	8" Sonic	Light Brown fine to medium grained sand, with a clay matrix, dry
23-24	8" Sonic	Light Brown fine to medium grained sand, very moist, trace amount of clay
24-26	8" Sonic	Brown fine to medium grained sand, slightly moist
26-30	8" Sonic	Brown fine to medium grained sand, with gravels present, slightly moist
30-33	8" Sonic	Light Brown fine grained sand, slightly moist
33-34	8" Sonic	Light Brown CLAY, very moist, high plasticity
34-36	8" Sonic	Light Brown fine grained sand, with a clay matrix, moist
36-38	8" Sonic	Light Brown Silty CLAY, moderately plastic, slightly moist
38-40	8" Sonic	Brownish Red silty CLAY, good plasticity, slightly moist
40-41	8" Sonic	Brown fine grained SAND, saturated
41-42	8" Sonic	Brown SILT with a clay matrix, slightly moist
42-52	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist
52-55	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist, very dense
55-56	8" Sonic	Brown fine grained SAND with a clay matrix very moist to saturated
56-57	8" Sonic	Reddish brown CLAY, high plasticity, slightly moist to moist
57-65	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

BAC-3

Interval (feet)	Drilling Method	Sample Description
		7/28/2015
0-8.5	8" Sonic	Light Brown fine grained Sand, dry
8.5-11	8" Sonic	Light Brown fine to medium grained SAND, moist
11-14	8" Sonic	Light Brown fine grained sand, with a clay matrix, dry
14-17	8" Sonic	Gravels with fine to medium grained SAND, slightly moist
17-20	8" Sonic	Brown fine grained sand, slightly moist
20-22	8" Sonic	Brown fine to medium grained sand, with a clay matrix, slightly moist
22-26	8" Sonic	Brown fine to medium grained sand, with a clay matrix, moist
26-30	8" Sonic	Brown fine grained sand, moist
30-43	8" Sonic	Light Brown CLAY, slightly moist to moist, high plasticity
		30-33 Silty CLAY, poor plasticity
		33-35 Silty CLAY, moderately plastic
		35-43 very little silt present, high plasticity
43-45	8" Sonic	Transitioned to a Reddish Brown CLAY, dry, high plasticity
45-50	8" Sonic	Transitioned to a Brown CLAY, dry, high plasticity
50-55	8" Sonic	Light Brown CLAY, moist, high plasticity
55-58	8" Sonic	Light Brown fine grained SAND, with a clay matrix, slightly moist to moist
58-72	8" Sonic	Light Brown CLAY, with a sandy matrix medium to poor plasticity, moist

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Log
ISPC
Delta, Utah

BAC-4

Interval (feet)	Drilling Method	USCS	Sample Description
8/10/2015			
0-0.5	8' Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8' Sonic	SP/SM	SAND with silt:
2.5-5	8' Sonic	SP	SAND:
5-9	8' Sonic		SAND:
9-10	8' Sonic	SP/SM	SAND with silt:
10-15	8' Sonic	SP	SAND:
15-17.5	8' Sonic	SP/SM	SAND with silt:
17.5-19	8' Sonic		SAND with silt:
19-2	8' Sonic	SC	Clayey SAND:
20-21	8' Sonic		Clayey SAND:
21-22	8' Sonic	CL	Sandy CLAY:
22-22.5	8' Sonic	ML	Sandy SILT:
22.5-25	8' Sonic	CL	Sandy CLAY:
25-32.5	8' Sonic	CH	CLAY:
32.5-33.75	8' Sonic	SP	SAND:
33.75-35	8' Sonic	SM	Silty SAND:
35-36.5	8' Sonic	SP/SM	SAND with silt:
36.5-37.5	8' Sonic		SAND with silt:
37.5-38	8' Sonic	SM	Silty SAND:
38-38.75	8' Sonic	CH	Sandy CLAY:
38.75-39	8' Sonic	SP/SM	SAND with silt:
39-40	8' Sonic	CH	Sandy CLAY:
40-42.5	8' Sonic	ML	Sandy SILT with clay:
42.5-43.5	8' Sonic	SM	Silty SAND and clay:
43.5-45	8' Sonic	CH	CLAY:
45-47.5	8' Sonic		CLAY:
47.5-48.5	8' Sonic		CLAY:
48.5-50	8' Sonic	ML	Clayey SILT with sand:
50-51.25	8' Sonic		Clayey SILT:
51.25-52.5	8' Sonic	CH	CLAY:
52.5-55	8' Sonic	SC	Clayey SAND:
55-56.5	8' Sonic	SM	Silty SAND:
56.5-57	8' Sonic	ML	Clayey SILT with sand:
57-57.5	8' Sonic	CH	CLAY:
57.5-58.5	8' Sonic		CLAY:
58.5-59.5	8' Sonic	ML	Clayey SILT with sand:
59.5-61	8' Sonic		Clayey SILT with sand:
61-64	8' Sonic		Clayey SILT with sand:
64-65	8' Sonic		Clayey SILT with sand:
65-65.5	8' Sonic	SM	Silty SAND:
65.5-67	8' Sonic	CL	Silty CLAY:
67-67.5	8' Sonic	ML	Clayey SILT:
67.5-69	8' Sonic	CH	CLAY:
69-69.5	8' Sonic		CLAY:
69.5-70	8' Sonic		CLAY:
70-72.5	8' Sonic	ML	Sandy SILT with clay:
72.5-74	8' Sonic	CH	Silty CLAY:
74-75	8' Sonic	SM	Silty SAND:

TD = 75'; PVC 4-inch screen from 55 to 75; PVC 4-inch riser from -2.5 to 55
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-5

Interval (feet)	Drilling Method	USCS	Sample Description
8/9/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-3	8" Sonic	SP	SAND:
3-6.5	8" Sonic		SAND:
6.5-10	8" Sonic		SAND:
10-12.5	8" Sonic		SAND:
12.5-15	8" Sonic	SP/SM	SAND with silt:
15-19	8" Sonic	SM	Silty SAND:
19-19.5	8" Sonic	SC	Clayey SAND:
19.5-20	8" Sonic	SP/SM	SAND with silt:
20-22.5	8" Sonic	CL	Sandy CLAY:
22.5-23.75	8" Sonic		Sandy CLAY:
23.75-25	8" Sonic		Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic	CL/CH	CLAY:
32.5-33.5	8" Sonic	SP	SAND:
33.5-35	8" Sonic		SAND:
35-36	8" Sonic	SC	Clayey SAND:
36-37.5	8" Sonic	ML	Sandy SILT:
37.5-38.5	8" Sonic		Sandy SILT:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-44.25	8" Sonic		Silty SAND with clay:
44.25-45	8" Sonic	CH	CLAY:
45-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50.75	8" Sonic	SM	Silty SAND:
50.75-52.5	8" Sonic	CH	CLAY:
52.5-53.5	8" Sonic		CLAY:
53.5-55.5	8" Sonic	SP	SAND:
55.5-57.5	8" Sonic	CH	CLAY:
57.5-59	8" Sonic		CLAY:
59-60	8" Sonic	SM	Silty SAND with clay:
60-62.5	8" Sonic	SP	SAND:
62.5-63	8" Sonic	SC	Clayey SAND:
63-65	8" Sonic	SP	SAND:
65-65.75	8" Sonic	SC	Clayey SAND:
65.75-66.5	8" Sonic	CH	CLAY:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-69	8" Sonic	CH	CLAY:
69-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 58 to 68; PVC 4-inch riser from -2.5 to 58
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-6

Interval (feet)	Drilling Method	USCS	Sample Description
8/8/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-5	8" Sonic	SP	SAND:
5-6.5	8" Sonic	SP/SM	SAND with silt:
6.5-7.5	8" Sonic	SP	SAND:
7.5-10	8" Sonic		SAND:
10-13.5	8" Sonic		SAND:
13.5-15	8" Sonic	SM	Silty SAND:
15-16	8" Sonic	SP	SAND:
16-17.5	8" Sonic	SM	Silty SAND:
17.5-18.25	8" Sonic	SP/SM	SAND with silt:
18.25-18.75	8" Sonic	CL	Sandy CLAY:
18.75-20	8" Sonic	SC	Clayey SAND:
20-21.5	8" Sonic	CH	Sandy CLAY:
21.5-23	8" Sonic	SM	Silty SAND:
23-25	8" Sonic	CL	CLAY:
25-27.5	8" Sonic	CH	CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic		CLAY:
32.5-33.5	8" Sonic		CLAY:
33.5-35	8" Sonic	SW	SAND:
35-36	8" Sonic	SM	Silty SAND:
36-37.5	8" Sonic	SP/SM	SAND with silt:
37.5-38.5	8" Sonic	CH	CLAY:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-43.5	8" Sonic	CH	Sandy CLAY:
43.5-45	8" Sonic		CLAY:
45-45.5	8" Sonic	SC	Clayey SAND:
45.5-47.5	8" Sonic	CH	CLAY:
47.5-48	8" Sonic	SP	SAND:
48-49.5	8" Sonic	SM	Silty SAND with clay:
49.5-50	8" Sonic	CH	Sandy CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic		CLAY:
55-56	8" Sonic	SM	Silty SAND:
56-60	8" Sonic	SW	SAND:
60-61	8" Sonic		SAND:
61-62.5	8" Sonic	CH	Sandy CLAY:
62.5-63.5	8" Sonic		CLAY:
63.5-65	8" Sonic	SC	Clayey SAND:

TD = 65'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-7

Interval (feet)	Drilling Method	USCS	Sample Description
8/7/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	Gravelly SAND:
2-2.5	8" Sonic	SP	Gravelly SAND:
2.5-5	8" Sonic		SAND:
5-7	8" Sonic		SAND:
7-8.5	8" Sonic		SAND:
8.5-9	8" Sonic	SP/SM	SAND with silt:
9-9.5	8" Sonic	SP	SAND:
9.5-11	8" Sonic	SP/SM	SAND with silt:
11-13	8" Sonic		SAND with silt:
13-17	8" Sonic	SM	Silty SAND:
17-18.5	8" Sonic		Silty SAND:
18.5-19	8" Sonic	ML	Sandy SILT:
19-20.25	8" Sonic	SP/SM	SAND with silt:
20.25-22	8" Sonic	CL	Sandy CLAY:
22-24	8" Sonic		Sandy CLAY:
24-25	8" Sonic	SC	Clayey SAND:
25-27.5	8" Sonic	CH	CLAY:
27.5-36.5	8" Sonic		CLAY:
36.5-40	8" Sonic	SP	SAND:
40-41.25	8" Sonic		SAND:
41.25-43.75	8" Sonic	SP/SM	SAND with silt:
43.75-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50	8" Sonic	SM	Silty SAND:
50-57.5	8" Sonic	CH	CLAY:
57.5-60	8" Sonic	SW	SAND:
60-62.5	8" Sonic		SAND:
62.5-64	8" Sonic	SP	SAND:
64-65	8" Sonic	CH	CLAY:
65-66.25	8" Sonic		Sandy CLAY:
66.25-67.5	8" Sonic		CLAY:
67.5-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 57 to 67; PVC 4-inch riser from -2.5 to 57
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BA-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/24/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SC	Clayey SAND:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
5-6	8" Sonic	SP	SAND:
6-9.5	8" Sonic		SAND:
9.5-11	8" Sonic		SAND:
11-11.5	8" Sonic	SM	Silty SAND:
11.5-12	8" Sonic		Silty SAND:
12-13	8" Sonic	SP/SM	SAND with silt:
13-17	8" Sonic	SP	SAND:
17-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22.5	8" Sonic		SAND:
22.5-25	8" Sonic	SM	Silty SAND:
25-26	8" Sonic	SP	SAND:
26-27.5	8" Sonic	SP/SM	SAND with silt:
27.5-28.25	8" Sonic	SM	Silty SAND with clay:
28.25-29.25	8" Sonic	SP/SM	SAND with silt:
29.25-30	8" Sonic	CL	CLAY:
30-31.5	8" Sonic		Sandy CLAY:
31.5-33	8" Sonic	ML	Sandy SILT:
33-35	8" Sonic	SM	Silty SAND with clay:
35-36.25	8" Sonic	SP/SM	SAND with silt:
36.25-40	8" Sonic	CH	CLAY:
40-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic	SP/SM	SAND with silt:
47.5-50	8" Sonic	SM	Silty SAND with clay:
50-51	8" Sonic	SC	Clayey SAND:
51-51.75	8" Sonic	SW	SAND:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53	8" Sonic	CH	Sandy CLAY:
53-54	8" Sonic		Sandy CLAY:
54-55	8" Sonic		CLAY:

TD = 55'; PVC 4-inch screen from 45 to 55; PVC 4-inch riser from -2.5 to 45
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BA-U-2

Interval (feet)	Drilling Method	USCS	Sample Description
7/25/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	ML	Sandy SILT:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4	8" Sonic		SAND with silt:
4-5	8" Sonic	ML	SILT with sand and clay:
5-6	8" Sonic	SP/SM	SAND with silt:
6-7	8" Sonic	SP	SAND:
7-9	8" Sonic	SW	Gravelly SAND:
9-9.75	8" Sonic		Gravelly SAND:
9.75-10.25	8" Sonic	SP	Gravelly SAND:
10.25-11	8" Sonic	SP/SM	SAND with silt:
11-12.5	8" Sonic	CL	CLAY:
12.5-13	8" Sonic	SP	SAND:
13-15.5	8" Sonic		SAND:
15.5-18	8" Sonic		SAND:
18-22.5	8" Sonic		SAND:
22.5-23	8" Sonic		SAND:
23-23.5	8" Sonic	SM	Silty SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-30	8" Sonic	SM	Silty SAND:
30-32.5	8" Sonic	SC	Clayey SAND:
32.5-35	8" Sonic	SM	Silty SAND with clay:
35-37.5	8" Sonic		Silty SAND:
37.5-40	8" Sonic	CL	Sandy CLAY:
40-42	8" Sonic	SC	Clayey SAND:
42-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		Sandy CLAY:
47.5-51.75	8" Sonic		CLAY:
51.75-53	8" Sonic	SM	Silty SAND:
53-54	8" Sonic		Silty SAND:
54-55	8" Sonic	SC/SM	Clayey SAND with silt:
55-56.5	8" Sonic	CH	CLAY:
56.5-57.5	8" Sonic		CLAY:
57.5-60	8" Sonic	SC	Clayey SAND:
60-60.75	8" Sonic	SM	Silty SAND with clay:
60.75-61.5	8" Sonic	SC	Clayey SAND:
61.5-62.5	8" Sonic	SP	SAND:
62.5-63.5	8" Sonic		SAND:
63.5-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic		SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
IPSC
Delta, Utah

WWC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/26/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP	SAND:
2.5-5	8" Sonic		SAND:
5-6.75	8" Sonic	SM	Silty SAND:
6.75-7.5	8" Sonic	ML	Sandy SILT:
7.5-10	8" Sonic		Sandy SILT:
10-12	8" Sonic		Sandy SILT:
12-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	CL	Silty CLAY:
15-17.5	8" Sonic		Silty CLAY:
17.5-18.5	8" Sonic		Silty CLAY:
18.5-19	8" Sonic		Sandy CLAY:
19-20	8" Sonic		Silty CLAY:
20-22	8" Sonic	CH	CLAY:
22-24.5	8" Sonic		Sandy CLAY:
24.5-25.5	8" Sonic		Sandy CLAY:
25.5-27	8" Sonic		Sandy CLAY:
27-31	8" Sonic		CLAY:
31-31.5	8" Sonic		CLAY:
31.5-33	8" Sonic		CLAY:
33-34.5	8" Sonic		Sandy CLAY:
34.5-35	8" Sonic		Sandy CLAY:
35-37.5	8" Sonic	SM	Silty SAND:
37.5-40	8" Sonic		Silty SAND:
40-41.5	8" Sonic	SP	SAND:
41.5-42.5	8" Sonic		SAND:
42.5-44	8" Sonic		SAND:
44-45	8" Sonic		SAND:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic		Sandy CLAY:
47.5-50.5	8" Sonic	SC/SM	SAND with silt and clay:
50.5-52.5	8" Sonic	SW	SAND:
52.5-53.5	8" Sonic		SAND:
53.5-55	8" Sonic	SM	Silty SAND:
55-57	8" Sonic		Silty SAND:
57-57.5	8" Sonic	CH	CLAY:
57.5-60			CLAY:

TD = 60'; PVC 4-inch screen from 48 to 58; PVC 4-inch riser from -2.5 to 48
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
IPSC
Delta, Utah

WWC-2

Interval (feet)	Driling Method	USCS	Sample Description
7/27/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SM	Silty SAND:
2.5-5	8" Sonic	SP	SAND:
5-7	8" Sonic		SAND:
7-9.5	8" Sonic	SW	Gravelly SAND:
9.5-10	8" Sonic	SW/SP	SAND:
10-12	8" Sonic	SP	SAND:
12-12.5	8" Sonic	SP/SW	Gravelly SAND:
12.5-14.5	8" Sonic	SW	Gravelly SAND:
14.5-15	8" Sonic	SP	SAND with gravel:
15-16	8" Sonic		SAND:
16-17.5	8" Sonic	CL	Sandy CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20	8" Sonic		Clayey SAND:
20-21	8" Sonic		Clayey SAND:
21-22	8" Sonic	CH	CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND with clay:
25-26.5	8" Sonic	SM/SC	Silty SAND and clay:
26.5-27.5	8" Sonic	SC	Clayey SAND with silt:
27.5-31.5	8" Sonic	CH	CLAY:
31.5-34	8" Sonic		Silty CLAY:
34-35.5	8" Sonic	SP	SAND:
35.5-37	8" Sonic	ML	Sandy SILT with clay:
37-38.5	8" Sonic	CL	Silty CLAY:
38.5-40	8" Sonic	SM	Silty SAND:
40-42	8" Sonic	CH	CLAY:
42-42.5	8" Sonic		Silty CLAY:
42.5-45	8" Sonic	SC	Clayey SAND:
45-46.25	8" Sonic	CH	CLAY:
46.25-46.75	8" Sonic	SW/SM	SAND with silt:
46.75-47	8" Sonic	ML	Sandy SILT:
47-47.5	8" Sonic	SM	Silty SAND:
47.5-50	8" Sonic	CH	CLAY:
50-51.5	8" Sonic	SM	Silty SAND:
51.5-52	8" Sonic	CH	Sandy CLAY:
52-52.5	8" Sonic	SM	CLAY:
52.5-53.5	8" Sonic	CH	Sandy CLAY:
53.5-55	8" Sonic	SM	Silty SAND:
55-56.25	8" Sonic	ML	Sandy SILT:
56.25-57.5	8" Sonic		SILT:
57.5-60	8" Sonic	SP/SM	SAND with silt:
60-61.5	8" Sonic	SM	Silty SAND:
61.5-62.5	8" Sonic	CH	CLAY:
62.5-63.75	8" Sonic	SP/SM	SAND with silt:
63.75-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND:
67.5-70	8" Sonic		Gravelly SAND:
70-70.5	8" Sonic	SC/SM	Silty SAND and clay:
70.5-72.5	8" Sonic	CH	CLAY:
72.5-75	8" Sonic		CLAY:

TD = 75'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

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WWC-3

Interval (feet)	Drilling Method	USCS	Sample Description
7/30/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1	8" Sonic	SP	Gravelly SAND:
1-2.5	8" Sonic	SM	Silty SAND:
2.5-3.5	8" Sonic		Silty SAND:
3.5-5	8" Sonic	SP/SM	SAND with silt:
5-6.5	8" Sonic	ML	Sandy SILT:
6.5-7.5	8" Sonic	CL	Sandy CLAY:
7.5-8	8" Sonic	SM	Silty SAND:
8-10	8" Sonic	SC	Clayey SAND:
10-11	8" Sonic	SM	Silty SAND:
11-12.5	8" Sonic		Silty SAND with clay:
12.5-13.5	8" Sonic		Silty SAND:
13.5-14	8" Sonic	SC	Clayey SAND:
14-15	8" Sonic	SM	Silty SAND:
15-15.5	8" Sonic	CH	CLAY:
15.5-16	8" Sonic		CLAY:
16-16.5	8" Sonic		Sandy CLAY:
16.5-17.5	8" Sonic		Sandy CLAY:
17.5-20	8" Sonic		CLAY:
20-21	8" Sonic		CLAY:
21-22	8" Sonic		CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND:
25-26.25	8" Sonic	SP/SM	SAND with silt:
26.25-27	8" Sonic	SP	SAND:
27-29	8" Sonic	SM	Silty SAND:
29-30	8" Sonic	CH	CLAY:
30-31	8" Sonic		CLAY:
31-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-36	8" Sonic	CH	CLAY:
36-37	8" Sonic		CLAY:
37-39.5	8" Sonic	SP/SM	SAND with silt:
39.5-40.5	8" Sonic	SP	SAND:
40.5-41.5	8" Sonic		SAND:
41.5-43	8" Sonic	CH	CLAY:
43-44	8" Sonic	SP/SM	SAND with silt:
44-45	8" Sonic	SM	Silty SAND:
45-47.5	8" Sonic	SP	SAND:
47.5-50	8" Sonic	CH	CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic	SP	SAND:
55-61	8" Sonic		SAND:
61-62.5	8" Sonic	SW	SAND:
62.5-65	8" Sonic		SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-69.5	8" Sonic	SW	SAND:
69.5-70	8" Sonic	CH	CLAY:

TD = 70'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-4

Interval (feet)	Drilling Method	USCS	Sample Description
7/29/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-5	8" Sonic		SAND with silt:
5-6.25	8" Sonic	ML	Sandy SILT:
6.25-7.25	8" Sonic	CL	CLAY:
7.25-8	8" Sonic	SC	Clayey SAND:
8-9	8" Sonic	SP/SC	SAND with clay:
9-10	8" Sonic	SP	SAND:
10-11	8" Sonic	ML	SILT:
11-12.5	8" Sonic	ML/CL	Clayey SILT:
12.5-14	8" Sonic	CL	CLAY:
14-15	8" Sonic		Sandy CLAY:
15-16	8" Sonic	SC	Clayey SAND:
16-18	8" Sonic		Clayey SAND:
18-19.5	8" Sonic	SM	Silty SAND:
19.5-20	8" Sonic	CH	CLAY:
20-21.25	8" Sonic		Sandy CLAY:
21.25-22.5	8" Sonic	SM	Silty SAND:
22.5-23.75	8" Sonic	CH	CLAY:
23.75-25	8" Sonic	SM	Silty SAND:
25-25.75	8" Sonic	SC	Clayey SAND:
25.75-27.5	8" Sonic	CL	Sandy CLAY:
27.5-29	8" Sonic	CH	CLAY:
29-30.5	8" Sonic		CLAY:
30.5-31.5	8" Sonic	SM	Silty SAND:
31.5-32.25	8" Sonic	CL	Sandy CLAY:
32.25-32.5	8" Sonic		Sandy CLAY:
32.5-33	8" Sonic	CH	CLAY:
33-36	8" Sonic	SP/SM	SAND with silt:
36-37	8" Sonic	SM	Silty SAND:
37-40	8" Sonic	SP	SAND:
40-42.5	8" Sonic		SAND:
42.5-45	8" Sonic		SAND:
45-46	8" Sonic	SP/SW	SAND:
46-46.5	8" Sonic	CH	CLAY:
45.5-47.5	8" Sonic		Sandy CLAY:
47.5-48.5	8" Sonic		CLAY:
48.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		CLAY:
50.5-52.5	8" Sonic	SM	Silty SAND:
52.5-54	8" Sonic	CH	CLAY:
54-55	8" Sonic	SP	SAND:
55-57	8" Sonic	CH	Sandy CLAY:
57-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SM	Silty SAND:
60-62	8" Sonic		Silty SAND:
62-62.5	8" Sonic	SC	Clayey SAND:
62.5-63	8" Sonic	CH	Sandy CLAY:
63-65	8" Sonic	SM	Silty SAND:
65-67.5	8" Sonic	SW	SAND:
67.5-69.5	8" Sonic	SP	SAND:
69.5-70	8" Sonic	SW	SAND:
70-72	8" Sonic		SAND:
72-72.5	8" Sonic	SP/SM	SAND with silt:
72.5-75	8" Sonic	SM	Silty SAND:
75-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-5

Interval (feet)	Drilling Method	USCS	Sample Description
7/28/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4.25	8" Sonic	SM	Silty SAND:
4.25-5	8" Sonic	SP	SAND:
5-7.5	8" Sonic	ML	Clayey SILT:
7.5-9	8" Sonic	CL	Silty CLAY:
9-10	8" Sonic	CL	Sandy CLAY:
10-10.5	8" Sonic	SC	Clayey SAND:
10.5-11.25	8" Sonic	CL	CLAY:
11.25-12.5	8" Sonic	ML	Clayey SILT:
12.5-13.25	8" Sonic	SM	Silty SAND:
13.25-13.75	8" Sonic	SC	Clayey SAND:
13.75-15	8" Sonic	CL	CLAY:
15-16	8" Sonic	CL	CLAY:
16-17.5	8" Sonic	CH	CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20.5	8" Sonic	CH	CLAY:
20.5-21.25	8" Sonic	CH	Sandy CLAY:
21.25-22	8" Sonic	CH	CLAY:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-24	8" Sonic	SM	Silty SAND:
24-25	8" Sonic	CH	CLAY:
25-26	8" Sonic	SM/CH	Silty SAND / CLAY:
26-27.5	8" Sonic	CH	CLAY:
27.5-28	8" Sonic	CH	Sandy CLAY:
28-28.25	8" Sonic	SM	Silty SAND:
28.25-30	8" Sonic	CH	CLAY:
30-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic	SP	SAND:
34-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic	SP/SM	SAND with silt:
40-42.5	8" Sonic	CH	CLAY:
42.5-42.75	8" Sonic	SM	Silty SAND:
42.75-44	8" Sonic	CH	Sandy CLAY:
44-44.5	8" Sonic	SM	Silty SAND:
44.5-45	8" Sonic	SM	Silty SAND:
45-45.5	8" Sonic	SM	Silty SAND:
45.5-46.75	8" Sonic	SM	Silty SAND:
46.75-47.5	8" Sonic	CH	CLAY:
47.5-50	8" Sonic	CH	CLAY:
50-50.5	8" Sonic	CH	Sandy CLAY:
50.5-51.5	8" Sonic	CH	CLAY:
51.5-52	8" Sonic	SM	Silty SAND:
52-53.25	8" Sonic	CH	CLAY:
53.25-53.5	8" Sonic	CH	CLAY:
53.5-54	8" Sonic	SC	Clayey SAND:
54-55	8" Sonic	SM/SC	Silty SAND and clay:
55-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SP	SAND:
60-60.75	8" Sonic	SP	SAND:
60.75-61.5	8" Sonic	CH	CLAY:
61.5-62.5	8" Sonic	SP/SM	SAND with silt:
62.5-64	8" Sonic	SP/SM	SAND with silt:
64-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SW	SAND with gravel:
67.5-70	8" Sonic	SW	Gravelly SAND:
70-72.5	8" Sonic	SW	SAND:
72.5-75	8" Sonic	SW	SAND:

TD = 75'; PVC 4-inch screen from 64 to 74; PVC 4-inch riser from -2.5 to 64
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Log
ISPC
Delta, Utah

WWU-1

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-4.75	8" Sonic	SP	SAND:
4.75-5	8" Sonic	SC	Clayey SAND:
5-7	8" Sonic	SP/SM	SAND with silt:
7-10.75	8" Sonic	SC	Clayey SAND:
10.75-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SC	Clayey SAND:
13-14	8" Sonic	SM	Silty SAND:
14-15	8" Sonic	SP	SAND:
15-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22	8" Sonic	SP/SM	SAND with silt:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-28	8" Sonic	SC	Clayey SAND:
28-30	8" Sonic	SW	Gravelly SAND:
30-32.5	8" Sonic	SP/SM	SAND with silt:
32.5-35	8" Sonic	SM	Silty SAND:
35-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic		SAND:
40-42.5	8" Sonic	SW/SM	SAND with silt:
42.5-43.25	8" Sonic	SM	Silty SAND:
43.25-44.25	8" Sonic		Silty SAND:
44.25-45	8" Sonic	SP/SW	SAND:
45-47.5	8" Sonic	SW	SAND:
47.5-50	8" Sonic	SP	SAND:
50-50.5	8" Sonic		SAND:
50.5-51.75	8" Sonic	ML	Sandy SILT:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53.25	8" Sonic	SC	Clayey SAND:
53.25-55	8" Sonic		Clayey SAND:
55-56.5	8" Sonic		Clayey SAND:
56.5-57.5	8" Sonic		Clayey SAND:
57.5-60	8" Sonic		Clayey SAND:
60-61	8" Sonic	ML	Clayey SILT with sand:
61-62.5	8" Sonic	SM	Silty SAND:
62.5-63.75	8" Sonic	CL	Sandy CLAY:
63.75-64.75	8" Sonic	SM	Silty SAND:
64.75-65.5	8" Sonic	SP	SAND:
65.5-66.5	8" Sonic	ML	Clayey SILT with sand:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-70	8" Sonic	SM	Silty SAND with clay:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWU-2

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-2.5	8" Sonic	ML	Gravelly SILT with sand:
2.5-4	8" Sonic	SP	SAND:
4-5	8" Sonic		SAND:
5-5.5	8" Sonic		SAND:
5.5-7.5	8" Sonic		SAND:
7.5-9.5	8" Sonic	SP/SW	SAND:
9.5-10	8" Sonic	SP	SAND:
10-11	8" Sonic	SW	SAND:
11-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	ML	Sandy SILT:
15-15.5	8" Sonic	SP	SAND:
15.5-17	8" Sonic	SC	Clayey SAND with gravel:
17-17.5	8" Sonic	SW	Gravelly SAND with sand:
17.5-19	8" Sonic		SAND:
19-20	8" Sonic		SAND:
20-22.5	8" Sonic	GW	Sandy GRAVEL:
22.5-23.5	8" Sonic	SW	SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-32.5	8" Sonic		SAND with silt:
32.5-33.5	8" Sonic	SW/SC	Gravelly SAND with clay:
33.5-35	8" Sonic	SP/SM	SAND with silt:
35-37.5	8" Sonic		SAND with silt:
37.5-39	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
39-40	8" Sonic	SC	Clayey SAND:
40-45	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
45-45.5	8" Sonic	SM	Silty SAND with clay:
45.5-47.5	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
47.5-49.5	8" Sonic	CH/SC	Sandy CLAY/Clayey SAND:
49.5-50	8" Sonic	SP/SM	SAND with silt:
50-51.5	8" Sonic	SC	Clayey SAND:
51.5-52.5	8" Sonic	SP/SC	SAND with clay:
52.5-55	8" Sonic	SP	SAND:
55-56.5	8" Sonic	CH	Sandy CLAY:
56.5-57.5	8" Sonic	SC	Clayey SAND:
57.5-59	8" Sonic	ML	Clayey SILT with sand:
59-60	8" Sonic	CH	Sandy CLAY:
60-62.5	8" Sonic	SC	Clayey SAND:
62.5-64	8" Sonic	CH	Sandy CLAY:
64-65	8" Sonic	SM	Silty SAND:
65-66.5	8" Sonic	SP	SAND:
66.5-67.5	8" Sonic	SM	Silty SAND:
67.5-75	8" Sonic	SW	SAND:

TD = 75'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Appendix G.

Ground Water Sampling and Analysis Plan

Intermountain Generating Facility
Delta, Utah

Stantec

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
Stantec Consulting Services, Inc.
8160 South Highland Drive
Sandy, UT 84093

Project No.: 203709098

November 30, 2015

Sign-off Sheet and Signatures of Environmental Professionals

This document entitled **Ground Water Sampling and Analysis Plan** was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Abbreviations

CB Landfill	Combustion By-Products Landfill
CoC	Chain-of-Custody
DO	Dissolved Oxygen
DQO	Data Quality Objectives
HASP	Health & Safety Plan
IGF	Intermountain Generating Facility
IPSC	Intermountain Power Service Corporation
l/min.	liters per minute
LCS	Laboratory Control Sample
MCLs	Maximum Contaminant Levels
MDLs	Method Detection Limits
mg/l	milligrams per liter
MSD	Matrix Spike Duplicate
msl	mean sea level
mv	millivolts
NTU	Nephelometric Turbidity Units
ORP	Oxygen Reduction Potential
QA/QC	Quality Assurance and Quality Control
QAPPs	Quality Assurance Project Plans
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
RPD	relative percent difference
RSD	Relative Standard Deviation
SAP	Coal Combustion Residuals
SAP	Sampling and Analysis Plan
SOPs	Standard Operating Procedures
SRM	Standard reference materials
Stantec	Stantec Consulting Services, Inc.
UDEQ	Utah Department of Environmental Quality
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

On behalf of Intermountain Power Service Corporation (IPSC), Stantec Consulting Services, Inc. ("Stantec") has prepared this report to outline IPSC's proposed ground water monitoring program at IPSC's Intermountain Generating Facility (IGF) located approximately 10 miles north of Delta, Millard County, Utah. The monitoring program addresses elements prescribed by the United States Environmental Protection Agency's (USEPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities [RIN-2050-AE81; FRL-9149-4] (USEPA Final CCR Rule) Title 40, Parts §257.90 Applicability; §257.91 Ground Water Monitoring Systems; §257.93 Ground Water Sampling and Analysis Requirements; §257.94 Detection Monitoring Program; and §257.95 Assessment Monitoring Program.

This *Sampling and Analysis Plan* (SAP) details IPSC's objectives and anticipated means, measures, and procedures for satisfying ground water monitoring, sampling, and analysis protocol for IPSC's three (3) CCR-regulated units, specifically including:

- Combustion By-Products Landfill (CB Landfill);
- Bottom Ash Surface Impoundment; and
- Wastewater Retention Surface Impoundment.

In conjunction with USEPA requisites prescribed by CCR Rule Title 40, Parts §257.90 – 257.95 (excerpted copies of which are presented as Appendix A herein), this SAP also addresses relevant guidance and pertinent information presented within the following USEPA and Utah Department of Environmental Quality (UDEQ) rules and guidance documents:

- UDEQ, Division of Water Quality *Rule R317-6. Ground Water Quality Protection*;
- UDEQ, Division of Waste Management and Radiation Control's Solid and Hazardous Waste *Rule R315-308. Ground Water Monitoring Requirements*;
- UDEQ, Division of Waste Management and Radiation Control's Solid and Hazardous Waste's *Ground Water Monitoring Plan Guidance* document; and
- USEPA *QA/G-5. Guidance for Quality Assurance Project Plans (QAPPs)*.

2.0 PROJECT AND DATA QUALITY OBJECTIVES

2.1 PROJECT OBJECTIVES

2.1.1 General Ground Water Quality Monitoring Program

The primary objective of this SAP is to outline IPSC's proposed ground water monitoring program, designed to investigate and monitor if, and to what degree, the uppermost aquifer beneath the CB Landfill, the Bottom Ash Surface Impoundment, and/or the Wastewater Retention Surface Impoundment might be impacted by release of CCR-related constituents from a respective CCR-regulated unit. As detailed in following report section *3.1 Ground Water Monitoring Well Network*, the ground water monitoring program is comprised of CCR unit-specific, ground water monitoring wells that monitor water quality within the uppermost aquifer and are located in presumed up-gradient (or background) and down-gradient directions in relation to each CCR unit.

Ground water quality results will dictate, in part, whether supplemental investigative and/or remedial activities might be warranted, as specified by the CCR Rule. The ground water quality monitoring program is to be implemented throughout the lifecycle of each CCR-regulated unit, including each unit's 30-year, post-closure period.

2.1.2 General Ground Water Monitoring Schedule

CCR Rule §257.94 Detection Monitoring Program stipulates that at "existing" CCR landfills and surface impoundments, which includes IPSC's CB Landfill and Bottom Ash and Wastewater Retention Surface Impoundments, a minimum of eight (8) independent samples from each CCR unit-specific, background and down-gradient monitoring well are to be collected and analyzed for constituents listed in Appendix III and Appendix IV of the CCR Rule no later than October 17, 2017 (individual constituents listed in following report section *3.1 Ground Water Monitoring Well Network*). IPSC anticipates conducting its initial 'Detection Monitoring' sampling event at each of the three CCR units during Fall 2015. IPSC anticipates conducting seven additional CCR unit-specific, sampling events on an approximate quarterly basis (i.e., every three months) thereafter, through approximately October 2017.

If there are no documented releases of CCR constituents to the uppermost aquifer beneath a CCR-regulated unit, then Detection Monitoring is to continue on a semi-annual basis (i.e., twice per year) during the active life and 30-year, post-closure period of each such unit. The CCR Rule also stipulates that an 'Assessment Monitoring' program (§257. 95) must be implemented within 90-days, and annually thereafter, when there is a statistically significant increase over background concentrations for one or more of the Appendix III constituents at a CCR unit.

Routine statistical analyses of ground water quality data will be conducted by IPSC's Consultant, using one or more of the alternative methodologies prescribed by the CCR Rule [§257. 93(f, g,& h)]. The Fall 2015 ground water quality results will be evaluated to help identify which specific statistical method or methodologies might be most appropriate for use in analyzing data associated with each of the three separate, CCR-regulated units.

Within 90 days of triggering an Assessment Monitoring program, and annually thereafter, all CCR unit-specific, monitoring wells are to be sampled and analyzed for all Appendix IV constituents. Within 90 days of obtaining the Assessment Monitoring laboratory results, and on at least a semi-annual basis thereafter, all CCR unit-specific, monitoring wells must be sampled and analyzed for all Appendix III constituents and only those Appendix IV constituents that were detected by the laboratory. Additionally, once Assessment Monitoring is triggered, Ground Water Protection Standards for all detected constituents are to be established in accordance with provisions prescribed by the CCR Rule.

This SAP proposes consistent ground water monitoring, sampling, and qualitative and quantitative analytical protocol to be followed throughout the anticipated, ground water monitoring program – regardless of the actual sampling schedule (quarterly, semi-annually, or otherwise, etc.). IPSC project management and field sampling personnel will be familiar with the measures prescribed in this SAP. In the event that site-specific, field conditions change, this SAP report may be amended and/or updated to incorporate any changes deemed warranted, and as such, this SAP should be considered a 'living' document. Moreover, IPSC's project-specific *Health & Safety Plan* (HASP) is a separate document, and as such is not addressed herein.

2.2 DATA QUALITY OBJECTIVES (DQOS)

The data quality objective (DQO) process is a systematic planning process for determining the type, quantity, quality, and adequacy of data and information in relation to their intended use and as necessary to make well-informed, valid, and defensible decisions. Ground water quality data will be collected and monitored to meet a variety of objectives, including but not limited to, monitoring for potential leaks from individual CCR units, pursuit of compliance with CCR Rule requisites, evaluation of adequacy of protection of public health and the environment, and if necessary, assessment of alternative ground water remediation options.

The program has been designed to provide appropriate representation of ground water quality and hydraulic characteristics at background and down-gradient, ground water monitoring wells, including:

- Measurement of static water levels in monitoring wells, prior to purging and sampling;
- Monitoring well purging and qualitative water quality, field parameter monitoring protocol;
- Ground water sample collection;
- Ground water sample preservation and shipment to the laboratory;
- Chain-of-Custody control;
- Laboratory analytical procedures and methodologies (Level III reporting); and overall
- Quality Assurance and Quality Control (QA/QC).

The DQO and QA/QC program proposed herein, in conjunction with Standard Operating Procedures (SOPs) presented as Appendix B herein, are intended to ensure that future ground water data are collected, analyzed, and evaluated in a consistent manner, since the data generated during such investigative actions will impact and support future aspects and decisions regarding the CCR units and associated ground water monitoring program. Data that meet the objectives and goals will be deemed acceptable. Data that do not meet objectives and goals will be reviewed on a case-by-case basis to ascertain usability.

The analytical QA objectives are defined in terms of sensitivity and precision, accuracy, reproducibility, comparability, and completeness (USEPA's 'PARCC' parameters). Utilization of the SAP requires implementation of procedures for obtaining and evaluating data in a manner that will result in a quantitative or qualitative representation of the PARCC parameters. The parameters of precision, accuracy, and completeness provide a quantitative measure of the quality of the data collected in the field. The parameters of representativeness and comparability utilize documentation of the site and laboratory procedures to qualitatively evaluate the data.

2.2.1 Precision

Precision is a measure of mutual agreement among replicate (or between duplicate) or co-located sample measurements of the same analyte. The closer the numerical values of the measurements are to each other, the more precise the measurement. Precision for a single analyte will be expressed as a relative percent difference (RPD) between results of field duplicate samples, laboratory duplicate samples, or Matrix Spike Duplicate (MSD) samples for cases where both results are sufficiently large. Otherwise, the absolute difference between the results is compared to a factor of the laboratory Reporting Limit (RL, whereby the RL is used for non-detect results).

Precision will be determined by collecting field duplicates at a minimum of one sample per 20 standard field samples (i.e., 5%) for each matrix (e.g., ground water) in addition to laboratory duplicates and laboratory MSDs. In addition, precision will be maintained by conducting routine instrument checks to demonstrate that operating characteristics are within predetermined limits.

Precision examines the spread of data about their mean. The spread represents how different the individual reported values are from the average reported values. Precision is thus a measure of the magnitude of errors and will be expressed as the RPD or the Relative Standard Deviation (RSD) for all methods. The lower these values are; the more precise are the data. These quantities are defined as follows:

$$\textbf{Relative Percent Difference-RPD (\%)} = 100 \times \frac{|S - D|}{(S + D)/2}$$

$$\textbf{Relative Standard Deviation-RSD (\%)} = (s/X) \times 100$$

Where: D= Concentration or value of an analyte in a duplicate sample
S = Concentration or value of an analyte in an original sample
X = Mean of replicate analyses
s = Standard deviation

2.2.2 Accuracy

Accuracy is a measure of bias in a measurement system. Accuracy measures the average or systematic error of an analytical method. This measure is defined as the difference between the measured value and the actual value. The closer the value of the measurement agrees with the true value; the more accurate the measurement. This will be expressed as the percent recovery of a surrogate, Laboratory Control Sample (LCS) analyte, or Matrix Spike (MS) analyte.

Accuracy will be expressed as the percent recovery. This quantity is defined as follows:

$$\textbf{Recovery (\%)} = \frac{|SC - UC|}{KC} \times 100$$

Where: SC = Measured concentration of an analyte in spiked sample or LCS
UC = Measured unspiked concentration of an analyte (assume to be zero for LCS and surrogates)
KC = Known concentration of an analyte added

2.2.3 Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data accurately and precisely represent characteristics of a population, parameter variations at a sampling point, or an environmental condition. The design of, and rationale for, the sampling program (in terms of the purpose for sampling, selecting the sampling locations, the number of samples to be collected, the ambient conditions for sample collection, the frequencies and timing for sampling, and the sampling techniques) assures that the environmental condition has been sufficiently represented.

Samples not properly collected or preserved, or which are not analyzed by the laboratory within prescribed Holding Times do not provide representative data. Moreover, Method Detection Limits (MDLs) above respective UDEQ-specified or risk-based Maximum Contaminant Levels (MCLs), Ground Water Protection Standards, or other Screening Levels do not provide representative data.

2.2.4 Completeness

Completeness is defined as the measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. Data completeness can be expressed as the percentage of valid data obtained from the measurement system. For data to be considered valid, it must meet all the acceptable criteria including accuracy and precision, as well as any other criteria required by the prescribed analytical method.

$$\textbf{Completeness (\%)} = \frac{V \times 100}{n}$$

Where: n = total number of measurements necessary to achieve a specified statistical level of confidence in decision making
V = number of measurements judged valid

In practice, completeness is evaluated by comparing project objectives to the quality and quantity of data collected to determine if any deficiencies exist. Missing data can be the result of numerous causes, such as accessibility problems, limitations of media available to sample, mechanical breakdown, sample container breakage, and other factors. Completeness will be quantitatively assessed as the percent of controlled QC parameters that are within limits.

The requirement for completeness is 90 percent for each individual analytical method for the following QC parameters:

- Initial calibration,
- Continuing calibrations,
- LCS percent recovery,
- MS/MSD,
- Field duplicate RPDs, and
- Surrogate percent recoveries.

The completeness requirement for holding times will be 100 percent.

2.2.5 Comparability

Comparability is a qualitative parameter expressing the confidence in which one data set can be compared with another. Sample data should be comparable for similar samples collected under like conditions. The comparability of data produced by and for this project is predetermined by the commitment of project staff and contracted laboratories to use SOPs, standardized methods, where possible, including USEPA-approved, analytical methods, or documented modifications thereof which provide equal or better results. These methods have specified units in which the results are to be reported.

2.2.6 Sensitivity

When selecting an analytical method during the DQO process, the achievable, Method Detection Limit (MDL) and method Reporting Limit (RL) must be evaluated to verify that the method will meet the project quantitation limits necessary to support project decision-making requirements. This process ensures that the analytical method sensitivity has been considered and that the methods used can produce data that satisfy users' needs while making the most effective use of resources. The concentration of any one target compound that can be detected and/or quantified is a measure of sensitivity for that compound. Sensitivity is instrument-, compound-, method-, and matrix-specific, and achieving the required project RL and/or MDL objectives depends on instrument sensitivity and potential matrix effects.

Sensitivity refers to the lowest concentration of an analyte that can be reliably identified and reported by an analytical method. Sensitivity is typically evaluated in terms of detection limits. There are two types of detection limits relevant to this project: Method Detection Limits (MDLs) and method Reporting Limits (RLs).

- MDLs: Method Detection Limits refer to the lowest concentration where only the presence of a given analyte can be reported with confidence. The exact concentration cannot be precisely determined. For this reason, results falling between the MDL and RL are assigned a qualifier (such as "J") which represents that the result is an estimated concentration.

- RLs: Method Reporting Limits refer to the lowest concentration where the presence and concentration can be measured and reported with 99% confidence. RLs are typically higher than MDLs for a given analyte.

While the laboratory establishes nominal MDLs and RLs for an analytical method, the MDLs and RLs for individual samples are affected by sample and analysis specific factors including sample matrix and analytical dilutions. For this reason, all individual results and qualifiers such as "J" will be reviewed to determine if sensitivity is acceptable. All MDLs and RLs will be compared to USEPA and UDEQ *Maximum Contaminant Levels* (MCLs) [same as UDEQ, DWQ *Ground Water Protection Standards*] for ground water samples - which are the anticipated, ground water protection standards for this project, as prescribed by the CCR Rule. At a minimum the MDLs, and preferably the RLs, must be less than the matrix appropriate screening levels to meet the sensitivity requirements for the project and be deemed acceptable - as is anticipated as part of this project.

In general, IPSC anticipates contracting a Utah-certified, analytical laboratory, whose standard/normal MDLs and RLs for analyses are less than anticipated ground water protection standards. As a result, general sensitivity problems are not anticipated, however sensitivity concerns with individual analyses may occur. If the sensitivity of a particular result is deemed questionable by the laboratory, the laboratory will report any such issue including appropriate justification for its analyses, interpretations, and conclusions. If the sensitivity of a particular result is deemed unacceptable, then additional actions might be warranted, including but not limited to: re-sampling and re-analysis with a lower MDL/RL.

3.0 GROUND WATER MONITORING PROGRAM

3.1 GROUND WATER MONITORING WELL NETWORK

Figure 1 is a generalized site location map, depicting the general site vicinity and the three (3) CCR-regulated units, namely:

- Combustion By-Products Landfill (CB Landfill);
- Bottom Ash Surface Impoundment; and
- Wastewater Retention Surface Impoundment.

Figure 2 is a CCR unit-specific map identifying the generalized locations of the ground water monitoring wells. Table 1 presents a summary of all ground water monitoring well construction specific details.

3.2 MEASURING STATIC WATER LEVELS IN MONITORING WELLS (SOP #1 IN APPENDIX B)

Field personnel may utilize Standard Operating Procedure #1 in Appendix B as the proposed procedure by which the static water level in each ground water monitoring will be measured. Prior to purging and ground water sample collection, field staff will measure the static water level within each ground water monitoring well array associated with each respective, CCR-regulated unit.

Water level data will be used to help estimate the ground water flow direction in the vicinity of each CCR unit for production of date-specific, ground water flow maps which will be included within IPSC's annual *Ground Water Monitoring and Sampling Summary Report*. The top of each ground water monitoring well casing has been surveyed by a Utah-registered surveyor in relation to a USGS benchmark and all on-site monitoring wells. Depth measurements will be converted to mean sea level (msl) elevations to establish true ground water elevations.

The depth to static water in each well will be measured utilizing an electronic meter, capable of measuring to 0.01-ft. The meter will be decontaminated prior to each use. The intent of the decontamination process is to attempt to minimize the potential for cross-well contamination, when using the meter between wells.

During each sampling event, static ground water level measurements will be made to the nearest 0.01-ft. from a consistent, reference point established on the northern top of each PVC monitoring well casing. Ground water level and total well depth measurements will be recorded on well-specific, "Ground Water Sampling Log," a copy of which is presented within SOP 3.

3.3 GROUND WATER PURGING AND SAMPLING PROTOCOL (SOP #2 IN APPENDIX B)

Field personnel may utilize Standard Operating Procedure #2 in Appendix B as the proposed procedure by which each ground water monitoring well is to be purged and sampled. Prior to actual ground water sample collection, each monitoring well will be purged to remove static water from the well casing and sand pack, thereby allowing collection of a water sample representative of ground water within the aquifer. As referenced below, no water samples will be filtered in the field.

USEPA's Final CCR Rule Part 257.93(i) notes:

> *"The owner or operator must measure "total recoverable metals" concentrations in measuring ground water quality...Ground water samples shall not be field-filtered prior to analysis."*

Additional clarification, as excerpted from the Preamble to the USEPA's Final CCR Rule (p. 21403), specifies the following:

> *"Sampling with no filtration means that increased importance is placed on proper well construction and purging sampling procedures to eliminate or minimize sources of sampling artifacts. Ground water sampling should be conducted utilizing EPA protocol low stress (low-flow) purging and sampling methodology, including measurement and stabilization of key indicator parameters prior to sampling. For purposes of sampling, this final rule presumes that a properly constructed well is capable of yielding ground water samples with low turbidity (< 5 Nephelometric Turbidity Units (NTU)), and by knowing the cause of turbidity the qualified professional engineer will be able to optimize well performance and reduce turbidity levels, eliminating the need for filtration."*

Purging and sampling will be conducted using similar protocol prescribed within the USEPA's *Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground Water Sample Collection* – a SOP developed by the Superfund/Resource Conservation and Recovery Act (RCRA) Ground Water Forum, drawing from an USEPA Ground Water Issue Paper, entitled "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedure" by Robert W. Puls and Michael J. Barcelona (1996). A copy of the USEPA SOP is retained by IPSC at the IGF for field personnel reference.

The intent of the 'low-flow' purging and sampling methodology is to minimize drawdown, turbidity, and purge volumes encountered during routine ground water sampling, so that a ground water sample may be collected that is representative of true geochemical conditions in the aquifer. IPSC anticipates using a Horiba® U-5000 (or similar analyzer with dissolved oxygen, turbidity, ORP, conductivity, and pH readouts) to monitor field parameters prior to each sample collection. All field parameter, monitoring equipment will be calibrated on at least a daily basis, prior to daily use, as specified by the manufacturer's guidelines and specifications.

The intake of the pump will be set at an approximate depth of the middle of the saturated well screen interval – well-specific depth to be determined in the field. The pumping rate will be established generally between 0.3 to 0.5 liters per minute (l/min.), until the water level in the well has stabilized or maintains a drawdown of less than 0.33 feet. During purging, water level and pump rate data will be monitored and recorded in a dedicated, field logbook, approximately every three to five minutes.

Purging of water from each well will continue at the low-flow rate, until the following field parameters have stabilized during three consecutive measurements:

- pH	+/- 0.1
- Specific Conductivity	+/- 3%
- Oxygen Reduction Potential (ORP)	+/- 10 mv (millivolts)
- Turbidity	+/- 10%
- Dissolved Oxygen (DO)	+/- 0.3 mg/l (milligrams per liter; i.e., parts per million-ppm)

Following purging, a water sample will be collected by reducing the pumping rate slightly and then collecting a sample directly within the laboratory-provided, sample containers.

In turn, the sample containers will be placed in a cooler with ice for delivery to the laboratory. The sampler will use new, disposable latex or Nitrile® gloves during all purging and sampling activities.

Ground water samples for various analytical tests will be placed directly into laboratory-provided, sample containers. When filling the sample bottles that contain preservation, care will be taken not to overfill the containers and deplete the preservatives.

If applicable, "duplicate" or "split" ground water sample bottles should be filled at the same time as the regular sample bottles are filled. Alternate the filling of bottles by first filling a normal sample bottle and then a duplicate sample bottle. This method of filling alternating bottles should continue until both suites of bottles are filled.

Pertinent information collected during well purging and sampling will be recorded on a well-specific, "Ground Water Sampling Log," a copy of which is presented within SOP 3. Pertinent information required includes well identification, date and time of purging and sampling, field personnel, method of purging/sampling, meters used to measure water quality parameters, measured water quality parameters, approximate amount of water evacuated from the well (in gallons), static water level measurement, and total well depth measurement, etc.

4.0 Quality Assurance and Quality Control

All quality assurance/quality control (QA/QC) and sampling protocol will be administered in accordance with provisions presented below. IPSC's Consultant will evaluate all field data results and the final analytical report provided by the laboratory, in terms of the QA/QC and DQOs specified in this *Sampling and Analysis Plan* report.

4.1 SAMPLE REQUIREMENTS, CONTAINERS, AND PRESERVATION

IPSC intends to contract a Utah-certified, analytical laboratory for ground water analyses. All ground water samples will be collected within laboratory-provided, sample containers, as preserved by the laboratory according to Methodologies and as planned and approved by the laboratory and IPSC.

It is anticipated that the following laboratory analyses and Methodologies, or similar, will be employed, regardless of which laboratory IPSC contracts (pH to be collected in the field):

Appendix III Parameter	Lab Method	Sample Container	Preservation	Holding Time
TDS	SM2540C	250 ml plastic	0-6° C	7 days
Boron	SW-846 6010C/ SW-			
Chloride	EPA 300.0/ SM4500(Cl)E	500 mL Plastic	0-6° C	28 days
Fluoride	EPA 300.0 SM4500(F)C	from above	0-6° C	28 days
pH	SW-846 9040C	from above	0-6° C	Analyze immediately
Sulfate	EPA 300.0 SM4500 (SO4)E	from above	0-6° C	28 days

Appendix IV Parameter	Lab Method	Sample Container	Preservation	Holding Time
Mercury	SW-846 7074A	500 mL Plastic	0-6° C HNO3 pH<2	28 days
14 Metals Sb, As, Ba, Be, Ca, Cd, Cr, Co, Pb, Li, Mo, Se, Tl	SW-846 6010C/ SW-846 6020A	from above	0-6° C HNO3 pH<2	6 months
Ra226 + Ra228	EPA 903.1 EPA 904.0	One 1 gallon cube container	HNO3 pH<2	6 months

4.2 CHAIN-OF-CUSTODY, HOLDING TIME, AND RECORD KEEPING

Strict Chain-of-Custody, sample labeling, record keeping, and QA/QC procedures will be implemented during sample collection and delivery of samples to the laboratory. Chain-of-Custody (CoC) sheets will be provided by the laboratory.

All samples will remain in secure custody of the sampler until delivery to the laboratory. All samples will be analyzed within prescribed Holding Times.

4.3 CROSS-CONTAMINATION

The potential for cross-contamination among samples will be minimized by using dedicated, new, laboratory-supplied, sample containers and shipping ice chests or similar for each individual sample. The sampler will use new, disposable latex or Nitrile® gloves during all purging and sampling activities. Prior to use at each well, all down-well purging and sampling equipment will be decontaminated by rinsing with potable water.

4.4 LABORATORY DATA EVALUATION AND REVIEW

All laboratory data and laboratory reporting protocol will satisfy Level III reporting requisites. Reduction of analytical data will be completed in accordance with the laboratory's *Quality Assurance Manual*. Laboratory QC procedures include:

- Instrument calibration standards
- Laboratory control samples (MB, MS/MSD, LCS)
- Surrogate standards
- Internal standards
- Interference checks
- Control charts
- Standard reference materials (SRM)
- Internal audits
- Quality system review

The first level of laboratory data review, which may contain multiple sublevels, will entail evaluation of correctness and completeness of the data. The laboratory data reviewer will evaluate the quality of the analytical data based on an established set of laboratory guidelines and lab-specific measures prescribed the laboratory-specific *Quality Assurance Manual*.

The laboratory data reviewer will review the data packages to confirm the following:

- Sample preparation information is correct and complete
- Analysis information is correct and complete
- The appropriate laboratory SOPs have been followed
- Analytical results are correct and complete
- QC sample results are within established control limits
- Blank results are within appropriate QC limits
- Analytical results for QC sample spikes, sample duplicates, initial and continuous calibration verifications of standards and blanks, standard procedural blanks, LCSs, and any interference check samples are correct and complete
- Tabulation of reporting limits related to the sample is correct and complete
- Documentation is complete (all anomalies in the preparation and analysis have been documented; holding times are documented)

The laboratory will perform the in-house analytical data reduction and QA review under the direction of the laboratory PM or designee. The laboratory is responsible for assessing data quality and advising of any data that were rated "preliminary" or "unacceptable," or were flagged with any other notations that would caution the data user of possible unreliability. Data reduction, QA review, and reporting by the laboratory will include the following:

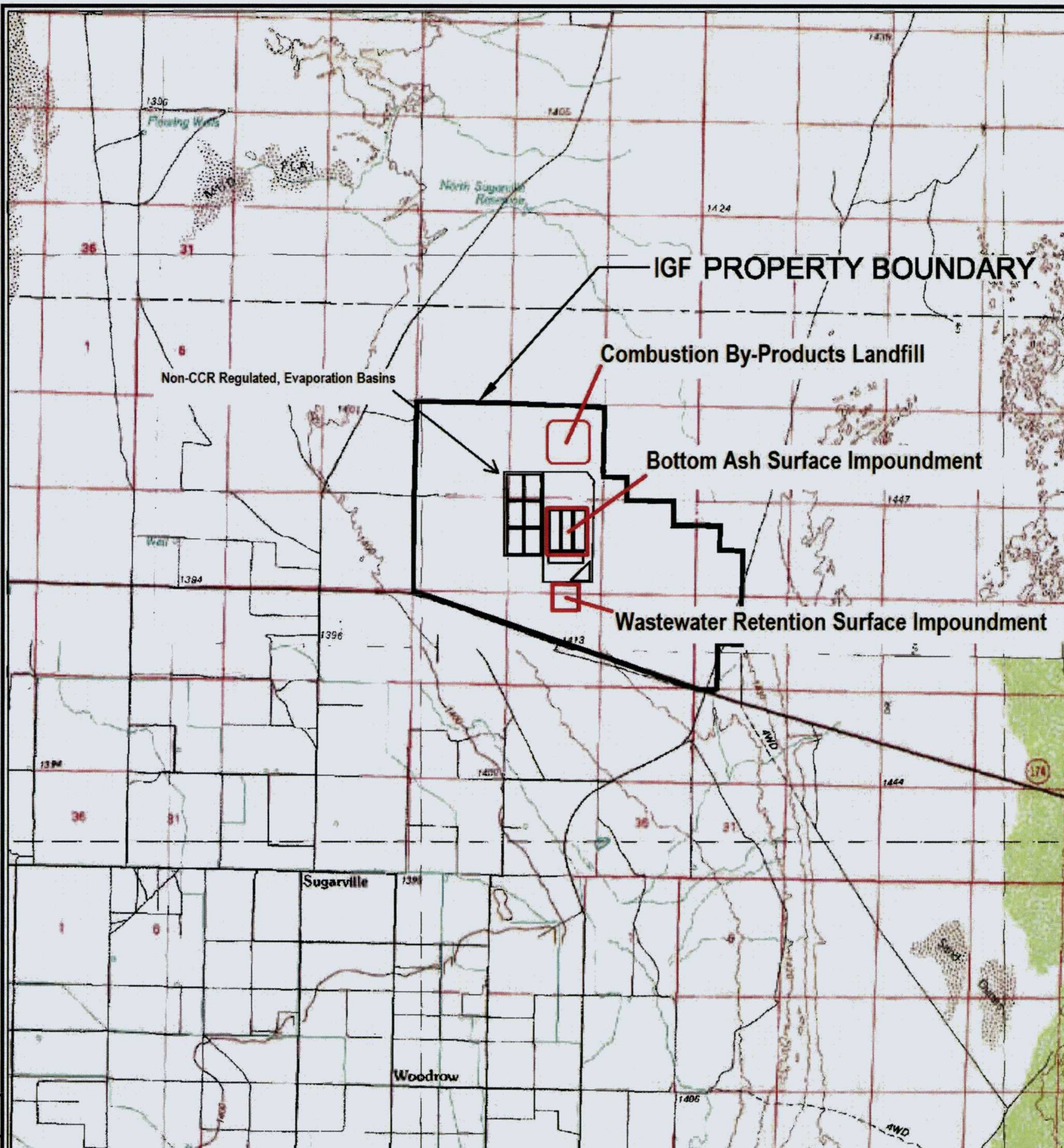
- Raw data produced by the analyst are processed and reviewed for attainment of QC criteria as outlined in this SAP report and the laboratory-specific *Quality Assurance Manual* and/or established US EPA methods. The raw data will also be reviewed for overall reasonableness.
- The data reviewer will check all manually-entered sample data for entry errors and will check for transfer errors in all data electronically uploaded from the instrument output into the software packages used for calculations and generation of report forms. Based on these checks, the reviewer will decide whether any sample re-analysis is required.
- The laboratory will review initial and continuing calibration data, and calculation of response factors, surrogate recoveries, MS/MSD recoveries, post-digestion (analytical) spike recoveries, internal standard recoveries, LCS recoveries, sample results, and other relevant QC measures.
- Upon acceptance of the preliminary reports by the laboratory data reviewer, the laboratory QA officer or designee will review and approve the data packages prior to the final reports being generated.

The data reduction and the QC review steps will be documented, signed, and dated by the analyst and the laboratory project manager or designee.

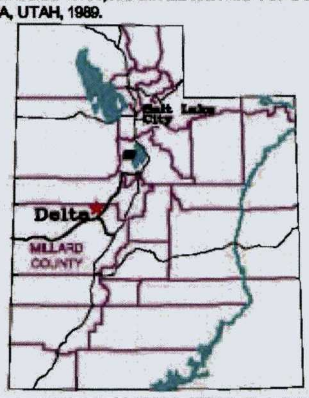
GROUND WATER SAMPLING AND ANALYSIS PLAN

November 30, 2015

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.



1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units

Delta, Utah

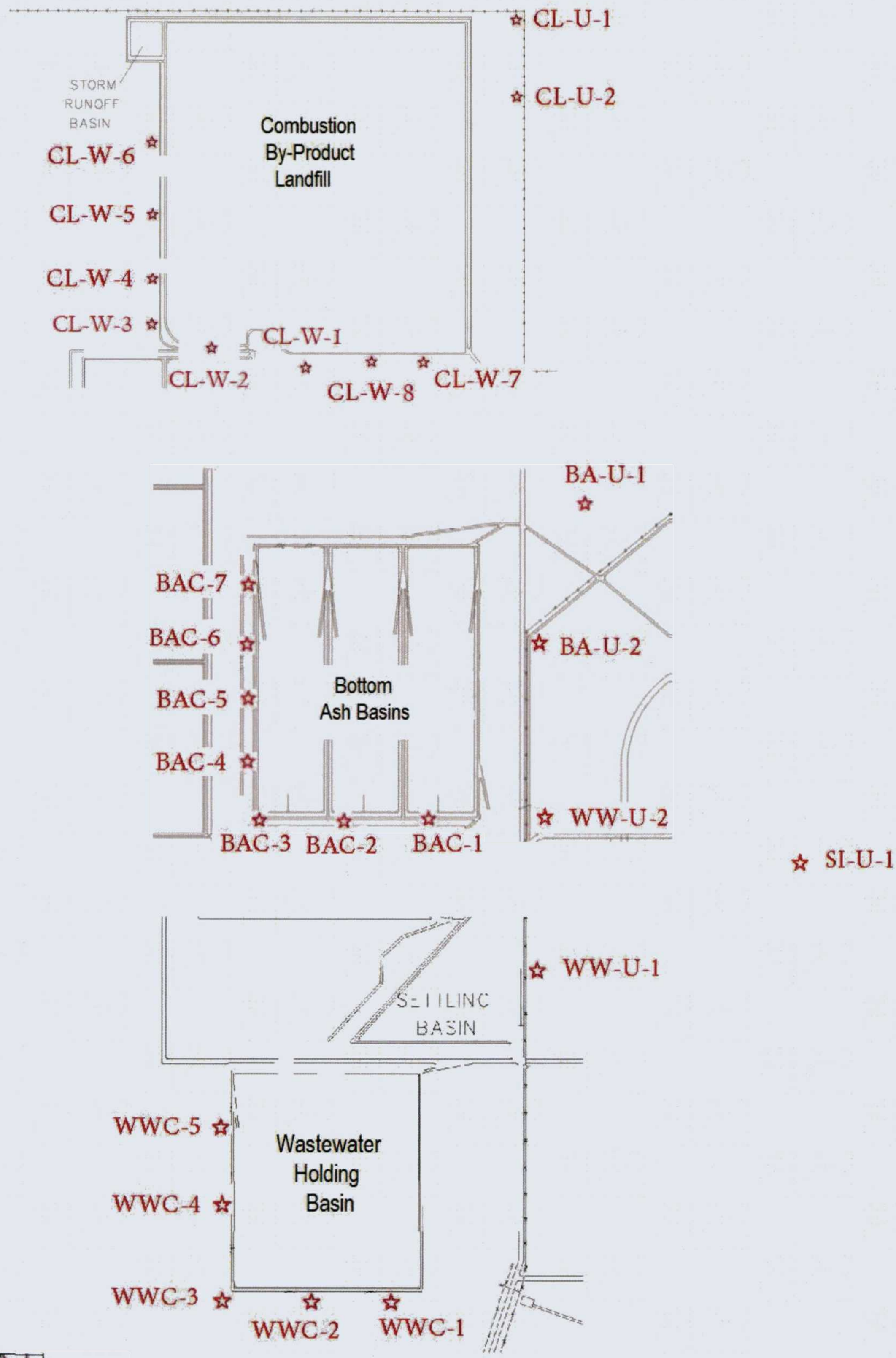
FIGURE 1
SITE TOPOGRAHIC MAP

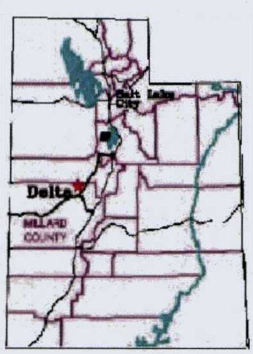
Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'	REVISION	DATE DRAWN

drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Unit Monitoring Well Network





CCR-Regulated Units
Delta, Utah

FIGURE 2. CCR Unit Monitoring Well Locations
(Generalized Locations)

Stantec

Design By	JR	Drawn By	CP	CH'D By		Not to Scale	REVISION	DATE DRAWN

Table 1 Ground Water Monitoring Well Construction Details

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Product Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668 70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668 72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I D	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Holding Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WC-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WC-U-2	8/11/2015	4-inch PVC	75	65-75	4655.46
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59

BGS = Below Ground Surface

MSL = Mean Sea Level

Appendix A
EXCERPTS FROM USEPA Final CCR Rule Title 40

Parts §257.90 Applicability;
§257.91 Ground Water Monitoring Systems;
§257.93 Ground Water Sampling and Analysis Requirements;
§257.94 Detection Monitoring Program; and
§257.95 Assessment Monitoring Program

FEDERAL REGISTER

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Part II

Environmental Protection Agency

40 CFR Parts 257 and 261

Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 257 and 261

[EPA–HQ–RCRA–2009–0640; FRL–9919–44– OSWER]

RIN–2050–AE81

Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or the Agency) is publishing a final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The available information demonstrates that the risks posed to human health and the environment by certain CCR management units warrant regulatory controls. EPA is finalizing national minimum criteria for existing and new CCR landfills and existing and new CCR surface impoundments and all lateral expansions consisting of location restrictions, design and operating criteria, groundwater monitoring and corrective action, closure requirements and post closure care, and recordkeeping, notification, and internet posting requirements. The rule requires any existing unlined CCR surface impoundment that is contaminating groundwater above a regulated constituent's groundwater protection standard to stop receiving CCR and either retrofit or close, except in limited circumstances. It also requires the closure of any CCR landfill or CCR surface impoundment that cannot meet the applicable performance criteria for location restrictions or structural integrity. Finally, those CCR surface impoundments that do not receive CCR after the effective date of the rule, but still contain water and CCR will be subject to all applicable regulatory requirements, unless the owner or operator of the facility dewaters and installs a final cover system on these inactive units no later than three years from publication of the rule. EPA is deferring its final decision on the Bevill Regulatory Determination because of regulatory and technical uncertainties that cannot be resolved at this time.

DATES: This final rule is effective on October 14, 2015.

Page 21482

Groundwater Monitoring

§ 257.90 Applicability.

(a) Except as provided for in § 257.100 for inactive CCR surface impoundments, all CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under §§ 257.90 through 257.98.

(b) *Initial timeframes*—(1) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2017, the owner or operator of the CCR unit must be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by § 257.91;

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by § 257.93;

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by § 257.94(b); and

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part as required by § 257.94.

(2) *New CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units.* Prior to initial receipt of CCR by the CCR unit, the owner or operator must be in compliance with the groundwater monitoring requirements specified in paragraph (b)(1)(i) and (ii) of this section. In addition, the owner or operator of the CCR unit must initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background well as required by § 257.94(b).

(c) Once a groundwater monitoring system and groundwater monitoring program has been established at the CCR unit as required by this subpart, the owner or operator must conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

(d) In the event of a release from a CCR unit, the owner or operator must immediately take all necessary measures to control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of contaminants into the environment. The owner or operator of the CCR unit must comply with all applicable requirements in §§ 257.96, 257.97, and 257.98.

(e) *Annual groundwater monitoring and corrective action report.* For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

(4) A narrative discussion of any transition between monitoring programs (*e.g.*, the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

(f) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

§ 257.91 Groundwater monitoring systems.

(a) *Performance standard.* The owner or operator of a CCR unit must install a groundwater monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that:

(1) Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the CCR management area where:

(i) Hydrogeologic conditions do not allow the owner or operator of the CCR unit to determine what wells are hydraulically upgradient; or

(ii) Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells; and

(2) Accurately represent the quality of groundwater passing the waste boundary of the CCR unit. The downgradient monitoring system must be installed at the waste boundary that ensures detection of groundwater contamination in the uppermost aquifer. All potential contaminant pathways must be monitored.

(b) The number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information that must include thorough characterization of:

(1) Aquifer thickness, groundwater flow rate, groundwater flow direction including seasonal and temporal fluctuations in groundwater flow; and

(2) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer, including, but not limited to, thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

(c) The groundwater monitoring system must include the minimum number of monitoring wells necessary to meet the performance standards specified in paragraph (a) of this section, based on the site-specific information specified in paragraph (b) of this section. The groundwater monitoring system must contain:

(1) A minimum of one upgradient and three downgradient monitoring wells; and

(2) Additional monitoring wells as necessary to accurately represent the quality of background groundwater that has not been affected by leakage from the CCR unit and the quality of groundwater passing the waste boundary of the CCR unit.

(d) The owner or operator of multiple CCR units may install a multiunit groundwater monitoring system instead of separate groundwater monitoring systems for each CCR unit.

(1) The multiunit groundwater monitoring system must be equally as capable of detecting monitored constituents at the waste boundary of

the CCR unit as the individual groundwater monitoring system specified in paragraphs (a) through (c) of this section for each CCR unit based on the following factors:

(i) Number, spacing, and orientation of each CCR unit;

(ii) Hydrogeologic setting;

(iii) Site history; and

(iv) Engineering design of the CCR unit.

(2) If the owner or operator elects to install a multiunit groundwater monitoring system, and if the multiunit system includes at least one existing unlined CCR surface impoundment as determined by § 257.71(a), and if at any time after October 19, 2015 the owner or operator determines in any sampling event that the concentrations of one or more constituents listed in appendix IV to this part are detected at statistically significant levels above the groundwater protection standard established under § 257.95(h) for the multiunit system, then all unlined CCR surface impoundments comprising the multiunit groundwater monitoring system are subject to the closure requirements under § 257.101(a) to retrofit or close.

(e) Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well borehole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples. The annular space (*i.e.*, the space between the borehole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the groundwater.

(1) The owner or operator of the CCR unit must document and include in the operating record the design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices. The qualified professional engineer must be given access to this documentation when completing the groundwater monitoring system certification required under paragraph (f) of this section.

(2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to the design specifications throughout the life of the monitoring program.

(f) The owner or operator must obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of this section. If the groundwater monitoring system includes the minimum number of monitoring wells specified in paragraph (c)(1) of this section, the certification must document the basis supporting this determination.

(g) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257 107(h)

§ 257.92 [Reserved]

§ 257.93 Groundwater sampling and analysis requirements.

(a) The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells required by § 257.91. The owner or operator of the CCR unit must develop a sampling and analysis program that includes procedures and techniques for:

(1) Sample collection;

(2) Sample preservation and shipment;

(3) Analytical procedures;

(4) Chain of custody control; and

(5) Quality assurance and quality control.

(b) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. For purposes of §§ 257.90 through 257.98, the term *constituent* refers to both hazardous constituents and other monitoring parameters listed in either appendix III or IV of this part.

(c) Groundwater elevations must be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator of the CCR unit must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same CCR management area must be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

(d) The owner or operator of the CCR unit must establish background groundwater quality in a hydraulically upgradient or background well(s) for each of the constituents required in the particular groundwater monitoring program that applies to the CCR unit as determined under § 257.94(a) or § 257.95(a) Background groundwater quality may be established at wells that are not located hydraulically upgradient from the CCR unit if it meets the requirements of § 257.91(a)(1).

(e) The number of samples collected when conducting detection monitoring and assessment monitoring (for both downgradient and background wells) must be consistent with the statistical procedures chosen under paragraph (f) of this section and the performance standards under paragraph (g) of this section. The sampling procedures shall be those specified under § 257 94(b) through (d) for detection monitoring, § 257.95(b) through (d) for assessment monitoring, and § 257.96(b) for corrective action.

(f) The owner or operator of the CCR unit must select one of the statistical methods specified in paragraphs (f)(1) through (5) of this section to be used in evaluating groundwater monitoring data for each specified constituent. The statistical test chosen shall be conducted separately for each constituent in each monitoring well.

(1) A parametric analysis of variance followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance based on ranks followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method that meets the performance standards of paragraph (g) of this section.

(6) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area. The certification must include a narrative description of the statistical method selected to evaluate the groundwater monitoring data.

(g) Any statistical method chosen under paragraph (f) of this section shall comply with the following performance standards, as appropriate, based on the statistical test method used:

(1) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of constituents. Normal distributions of data values shall use parametric methods. Non-normal distributions shall use non-parametric methods. If the distribution of the constituents is shown by the owner or operator of the CCR unit to be inappropriate for a normal theory test, then the data must be transformed or a distribution-free (non-parametric) theory test must be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparison procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

(3) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be such that this approach is at least as effective as any other approach in this section for evaluating groundwater data. The parameter values shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(4) If a tolerance interval or a predictional interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be such that this approach is at least as effective as any other approach in this section for evaluating groundwater data. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(5) The statistical method must account for data below the limit of detection with one or more statistical procedures that shall at least as effective as any other approach in this section for evaluating groundwater data. Any practical quantitation limit that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(6) If necessary, the statistical method must include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

(h) The owner or operator of the CCR unit must determine whether or not there is a statistically significant increase over background values for each constituent required in the particular groundwater monitoring program that applies to the CCR unit, as determined under § 257.94(a) or § 257 95(a).

(1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the groundwater quality of each constituent at each monitoring well designated pursuant to § 257.91(a)(2) or (d)(1) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs (f) and (g) of this section.

(2) Within 90 days after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background for any constituent at each monitoring well.

(i) The owner or operator must measure "total recoverable metals" concentrations in measuring groundwater quality. Measurement of total recoverable metals captures both the particulate fraction and dissolved fraction of metals in natural waters. Groundwater samples shall not be field-filtered prior to analysis.

(j) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the Internet requirements specified in § 257.107(h).

§ 257.94 Detection monitoring program.

(a) The owner or operator of a CCR unit must conduct detection monitoring at all groundwater monitoring wells consistent with this section. At a minimum, a detection monitoring program must include groundwater monitoring for all constituents listed in appendix III to this part.

(b) Except as provided in paragraph (d) of this section, the monitoring frequency for the constituents listed in appendix III to this part shall be at least semiannual during the active life of the CCR unit and the post-closure period For existing CCR landfills and existing CCR surface impoundments, a minimum of eight independent samples from each background and downgradient well must be collected and analyzed for the constituents listed in appendix III and IV to this part no later than October 17, 2017. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, a minimum of eight independent samples for each background well must be collected and analyzed for the constituents listed in appendices III and IV to this part during the first six months of sampling.

(c) The number of samples collected and analyzed for each background well and downgradient well during subsequent semiannual sampling events must be consistent with § 257.93(e), and must account for any unique characteristics of the site, but must be at least one sample from each background and downgradient well.

(d) The owner or operator of a CCR unit may demonstrate the need for an alternative monitoring frequency for repeated sampling and analysis for constituents listed in appendix III to this part during the active life and the post-closure care period based on the availability of groundwater. If there is not adequate groundwater flow to sample wells semiannually, the alternative frequency shall be no less than annual. The need to vary monitoring frequency must be evaluated on a site-specific basis. The demonstration must be supported by, at a minimum, the information specified in paragraphs (d)(1) and (2) of this section.

(1) Information documenting that the need for less frequent sampling. The alternative frequency must be based on consideration of the following factors:

(i) Lithology of the aquifer and unsaturated zone;

(ii) Hydraulic conductivity of the aquifer and unsaturated zone; and

(iii) Groundwater flow rates.

(2) Information documenting that the alternative frequency will be no less effective in ensuring that any leakage from the CCR unit will be discovered within a timeframe that will not materially delay establishment of an assessment monitoring program.

(3) The owner or operator must obtain a certification from a qualified

professional engineer stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

(e) If the owner or operator of the CCR unit determines, pursuant to § 257.93(h) that there is a statistically significant increase over background levels for one or more of the constituents listed in appendix III to this part at any monitoring well at the waste boundary specified under § 257.91(a)(2), the owner or operator must:

(1) Except as provided for in paragraph (e)(2) of this section, within 90 days of detecting a statistically significant increase over background levels for any constituent, establish an assessment monitoring program meeting the requirements of § 257.95.

(2) The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under this section. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

(3) The owner or operator of a CCR unit must prepare a notification stating that an assessment monitoring program has been established. The owner or operator has completed the notification when the notification is placed in the facility's operating record as required by § 257.105(h)(5).

(f) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the Internet requirements specified in § 257.107(h).

§ 257.95 Assessment monitoring program.

(a) Assessment monitoring is required whenever a statistically significant increase over background levels has been detected for one or more of the constituents listed in appendix III to this part.

(b) Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator of the CCR unit must sample and analyze the groundwater for all constituents listed in appendix IV to this part. The number of samples collected and analyzed for each well during each sampling event must be consistent with § 257.93(e), and must account for any unique characteristics of the site, but must be at least one sample from each well.

(c) The owner or operator of a CCR unit may demonstrate the need for an alternative monitoring frequency for repeated sampling and analysis for constituents listed in appendix IV to this part during the active life and the post-closure care period based on the availability of groundwater. If there is not adequate groundwater flow to sample wells semiannually, the alternative frequency shall be no less than annual. The need to vary monitoring frequency must be evaluated on a site-specific basis. The demonstration must be supported by, at a minimum, the information specified in paragraphs (c)(1) and (2) of this section.

(1) Information documenting that the need for less frequent sampling. The alternative frequency must be based on consideration of the following factors:

(i) Lithology of the aquifer and unsaturated zone;

(ii) Hydraulic conductivity of the aquifer and unsaturated zone; and

(iii) Groundwater flow rates.

(2) Information documenting that the alternative frequency will be no less effective in ensuring that any leakage from the CCR unit will be discovered within a timeframe that will not materially delay the initiation of any necessary remediation measures.

(3) The owner or operator must obtain a certification from a qualified professional engineer stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

(d) After obtaining the results from the initial and subsequent sampling events required in paragraph (b) of this section, the owner or operator must:

(1) Within 90 days of obtaining the results, and on at least a semiannual basis thereafter, resample all wells that were installed pursuant to the requirements of § 257.91, conduct analyses for all parameters in appendix III to this part and for those constituents in appendix IV to this part that are detected in response to paragraph (b) of this section, and record their concentrations in the facility operating record. The number of samples collected and analyzed for each background well and downgradient well during subsequent semiannual sampling events must be consistent with § 257.93(e), and must account for any unique characteristics of the site, but must be at least one sample from each background and downgradient well;

(2) Establish groundwater protection standards for all constituents detected pursuant to paragraph (b) or (d) of this section. The groundwater protection standards must be established in accordance with paragraph (h) of this section; and

(3) Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

(e) If the concentrations of all constituents listed in appendices III and IV to this part are shown to be at or below background values, using the statistical procedures in § 257.93(g), for two consecutive sampling events, the owner or operator may return to detection monitoring of the CCR unit. The owner or operator must prepare a notification stating that detection monitoring is resuming for the CCR unit. The owner or operator has completed the notification when the notification is placed in the facility's operating record as required by § 257.105(h)(7).

(f) If the concentrations of any constituent in appendices III and IV to this part are above background values, but all concentrations are below the groundwater protection standard established under paragraph (h) of this section, using the statistical procedures in § 257.93(g), the owner or operator must continue assessment monitoring in accordance with this section.

(g) If one or more constituents in appendix IV to this part are detected at statistically significant levels above the groundwater protection standard established under paragraph (h) of this section in any sampling event, the owner or operator must prepare a notification identifying the constituents in appendix IV to this part that have exceeded the groundwater protection standard. The owner or operator has completed the notification when the notification is placed in the facility's operating record as required by § 257.105(h)(8). The owner or operator of the CCR unit also must:

(1) Characterize the nature and extent of the release and any relevant site conditions that may affect the remedy ultimately selected. The characterization must be sufficient to support a complete and accurate assessment of the corrective measures necessary to effectively clean up all releases from the CCR unit pursuant to § 257.96. Characterization of the release includes the following minimum measures:

(i) Install additional monitoring wells necessary to define the contaminant plume(s);

(ii) Collect data on the nature and estimated quantity of material released including specific information on the constituents listed in appendix IV of this part and the levels at which they are present in the material released;

(iii) Install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with paragraph (d)(1) of this section; and

(iv) Sample all wells in accordance with paragraph (d)(1) of this section to characterize the nature and extent of the release.

(2) Notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with paragraph (g)(1) of this section. The owner or operator has completed the notifications when they are placed in the facility's operating record as required by § 257.105(h)(8).

(3) Within 90 days of finding that any of the constituents listed in appendix IV to this part have been detected at a statistically significant level exceeding the groundwater protection standards the owner or operator must either:

(i) Initiate an assessment of corrective measures as required by § 257.96; or

(ii) Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

(4) If a successful demonstration has not been made at the end of the 90 day period provided by paragraph (g)(3)(ii) of this section, the owner or operator of the CCR unit must initiate the assessment of corrective measures requirements under § 257.96.

(5) If an assessment of corrective measures is required under § 257.96 by either paragraph (g)(3)(i) or (g)(4) of this section, and if the CCR unit is an existing unlined CCR surface impoundment as determined by § 257.71(a), then the CCR unit is subject to the closure requirements under § 257.101(a) to retrofit or close. In addition, the owner or operator must prepare a notification stating that an assessment of corrective measures has been initiated.

(h) The owner or operator of the CCR unit must establish a groundwater protection standard for each constituent in appendix IV to this part detected in the groundwater. The groundwater protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been established under §§ 141.62 and 141.66 of this title, the MCL for that constituent;

(2) For constituents for which an MCL has not been established, the background concentration for the constituent established from wells in accordance with § 257.91; or

(3) For constituents for which the background level is higher than the MCL identified under paragraph (h)(1) of this section, the background concentration.

(i) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the Internet requirements specified in § 257.107(h).

Appendix B Standard Operating Procedures (SOPs)

SOP #1. Static Ground Water Level Measurements

Prior to ground water monitoring purging and water sample collection, static water level measurements will be made and recorded on a well-specific and date-specific, "Ground Water Sampling Log," a copy of which is presented in following SOP #3.

The depth to static water in each well will be measured utilizing an electronic meter, capable of measuring to 0.01-ft. The meter will be decontaminated prior to each use, scrubbing all downhole equipment with a plastic-bristled brush and a potable water and Liquinox® and/or Alconox® detergent soap wash, followed by triple-rinses of deionized water. The intent of the decontamination process is to attempt to minimize the potential for cross-well contamination, when using the meter between wells.

During each sampling event, static ground water level measurements will be made to the nearest 0.01-ft. from a consistent, reference point established on the northern top of each PVC monitoring well casing. Ground water level and total well depth measurements will be recorded on a well-specific and date-specific, *Ground Water Sampling Log*.

SOP #2. Ground Water Purging & Sampling Procedures

Prior to each sampling round, the monitoring wells will be purged to remove stagnant water from the well casing and sand pack, thereby allowing collection of an analytical sample that is representative of formation ground water. Purging and sampling will be conducted using similar protocol prescribed within the US EPA's *Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground Water Sample Collection* – a SOP developed by the Superfund/RCRA Ground Water Forum, drawing from an US EPA Ground Water Issue Paper, entitled "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedure" by Robert W. Puls and Michael J. Barcelona (1996).

The intent of the 'low-flow' purging and sampling methodology is to minimize drawdown, turbidity, and purge volumes encountered during routine ground water sampling, so that a ground water sample may be collected that is representative of true geochemical conditions in the aquifer. IPSC anticipates using a Solinst®-type, flow-through cell, peristaltic pump with disposable Teflon® poly-tubing, and field parameter monitoring sensors (e.g.; for example: a Horiba® U-22, or a Hanna® Instruments 9000 series, or similar analyzer with dissolved oxygen, turbidity, ORP, conductivity, and pH readouts). All field parameter, monitoring equipment will be calibrated on at least a daily basis, prior to daily use, as specified by the manufacturer's guidelines and specifications.

The intake of the pump will be set at an approximate depth of the middle of the saturated well screen interval – well-specific depth to be determined in the field. The pumping rate will be established generally between 0.3 to 0.5 liters per minute (l/min.), until the water level in the well has stabilized or maintains a drawdown of less than 0.33 feet. During purging, water level and pump rate data will be monitored and recorded in the field logbook, every three to five minutes. Purging of water will continue at the low-flow rate, until the following field parameters have stabilized during three consecutive measurements:

- pH	+/- 0.1
- Specific Conductivity	+/- 3%
- Oxygen Reduction Potential (ORP)	+/- 10 mv
- Turbidity	+/- 10%
- Dissolved Oxygen (DO)	+/- 0.3 mg/l

Following purging, a water sample will be collected by reducing the pumping rate slightly and then collecting a sample directly within the laboratory-provided, sample containers. The sample should be collected prior to passing through the flow-through cell; and therefore, the flow-through cell will be disconnected prior to each sample collection. In turn, the sample containers will be placed in a cooler with ice for delivery to the laboratory. The sampler will use new, disposable latex or Nitrile® gloves during all purging and sampling activities. Prior to use at each well, the flow-through cell and water quality field parameter sensors will be decontaminated by rinsing with deionized water.

Ground water samples for various analytical tests will be placed directly into laboratory-provided, sample containers. When filling the sample bottles that contain preservation, care will be taken not to overfill the containers and deplete the preservatives.

If applicable, "duplicate" or "split" ground water sample bottles should be filled at the same time as the regular sample bottles are filled. Alternate the filling of bottles by first filling a normal sample bottle and then a duplicate sample bottle. This method of filling alternating bottles should continue until both suites of bottles are filled.

Pertinent information collected during well purging and sampling will be recorded on a well-specific, *Ground Water Sampling Log*, a copy of which is presented within SOP 3. Pertinent information required includes well identification, date and time of purging and sampling, field personnel, method of purging/sampling, meters used to measure water quality parameters, measured water quality parameters, approximate amount of water evacuated from the well (in gallons), static water level measurement, and total well depth measurement, etc.

SOP #3. Sample Documentation and Handling

Sample collection information will be entered into the dedicated field logbook and recorded appropriately on respective *Ground Water Sampling Logs* (presented below). Once sealed, individual sample bottles will be labeled (sample name/number; sampler name; date; time; analyses; etc.) and placed in a laboratory-provided cooler with ice. A laboratory-provided, temperature blank will be included in each cooler.

Sample documentation will be enclosed in sealed plastic bags and taped to the underside of the cooler lid. Coolers will be secured with strapping tape and custody seals. The custody seals will be affixed to each sample cooler (not each bottle). Samples will be delivered to the certified laboratory within prescribed 'Holding Times,' but preferably within 24 hours of sample collection.

Prior to laboratory delivery, each sample will be logged on a laboratory-provided Chain-of-Custody (CoC) Form. The CoC form will be placed in a cooler and will accompany the analytical samples during laboratory delivery.

Chain-of-Custody (CoC) Sample Control

A required part of any sampling and analytical process is a system for sample control from collection to data reporting. This includes the ability to trace the possession and handling of samples from the time of collection through analysis and final deposition. This system also ensures against tampering or contamination of samples. The documentation of the sample's history is referred to as the CoC. Initially after collection, a sample is considered to be under a person's custody if it fits the following criteria:

- In an individual's possession.
- In view of the individual after that person has taken possession.
- Secured by that person, so that no one can tamper with the sample (for example, a sample secured under a CoC seal and placed in a locked car trunk, or locked room).

The field technician will use CoC record forms that are provided with the sample containers and ice chest provided by the laboratory. CoCs should be equivalent to standard US EPA Office of Enforcement CoC forms. The sequence for transferring samples from the possession of the sampler, as cited above, to the contract laboratory should be as follows, generally:

> When the sample bottles are delivered to the laboratory, both the sender and receiver sign and date the CoC form, as well as specifying on the form what has changed hands. Anytime the sample bottles change hands (whether empty or full) both parties sign and date the transfer.

The following information is included on the CoC:

- Project number
- Project name
- Sample ID number
- Signature of sampler
- Date and time of collection
- Type and matrix of sample
- Number of containers
- Preservative
- Requested analyses
- Inclusive dates of possession
- Signature of receiver

The following log will be completed for each and every ground water sample being delivered to the laboratory for quantitative analysis:

GROUND WATER SAMPLING LOG

WELL No.: ______________________ CCR-Regulated Unit Name.: ______________________

DATE: ______________________ WEATHER/TEMP.: ______________________

TIME: ______________________ SAMPLED BY: ______________________

DEPTH TO STATIC WATER LEVEL (ft below TOC, prior to purging/sampling). ______________________

DEPTH TO BOTTOM OF WELL: ______________________

PURGE/SAMPLING METHOD/EQUIP: ______________________

Low-Flow Purging, Field Data:

(if more intervals needed, record under Comments below)

	Acceptable Range	Interval 1	Interval 2	Interval 3	Interval 4	FINAL READING
- pH	+/- 0.1					
- specific conductivity	+/- 3%					
- ORP	+/- 10 mv					
- turbidity	+/- 10%					
- dissolved oxygen	+/- 0.3 mg/l					

APPROX. VOLUME (GALS.) OF WATER PURGED FROM WELL: ______________________

NUMBER OF SAMPLE CONTAINERS: ______________________

SAMPLE PRESERVATION: ______________________

TRANSPORTED TO WHAT LAB: ______________________ TRANSPORTED BY WHOM: ______________________

ANALYSIS REQUIRED: ______________________

COMMENTS: ______________________

Appendix H.

INTERMOUNTAIN POWER SERVICE CORPORATION

August 30, 2016

Mr. Scott Anderson, Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, UT
84114-4880

Dear Mr. Anderson,

Coal Combustion Residual Rule Notifications

As per 40 CFR 257.106(h)(2) and Subsection R315-319-106(h)(2), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the groundwater monitoring system certification specified under 40 CFR 257.105(h)(3) and Subsection R315-319-105(h)(3). The groundwater monitoring system certification is contained in the Coal Combustion Residual (CCR) Units Ground Water Monitoring Well Design and Installation Summary Report that has been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

As per 40 CFR 257.106(g)(5), 40 CFR 257.106(g)(7), Subsection R315-319-106(g)(5), and Subsection R315-319-106(g)(7), Intermountain Power Service Corporation (IPSC) is providing notification of the availability of the periodic inspection reports specified under 40 CFR 257.105(g)(6), 40 CFR 257.105(g)(9), Subsection R315-319-105(g)(6), and Subsection R315-319-105(g)(9). Individual reports for the Intermountain Power Combustion By-products Landfill, the Intermountain Power Bottom Ash Basin (UT00463), and the Intermountain Power Waste Water Basin (UT00468) each titled Initial Annual Inspection Report have been placed in IPSC's CCR Operating Record and uploaded to IPSC's website (www.ipsc.com).

If you have any questions or comments, please contact Mr. Mike Utley at (435) 864-6489, or by email at mike.utley@ipsc.com.

Cordially,

Jon A. Finlinson
President and Chief Operations Officer

MU/HBI:he

cc: Bradford L. Packer
Kevin Peng

850 West Brush Wellman Road, Delta, Utah 84624 / Telephone: (435) 864-4414 / FAX: (435) 864-6670 / Fed. I.D. #87-0388573

Appendix I.

Intermountain Power Combustion By-Products Landfill sign installed December 15, 2015

Intermountain Power Bottom Ash Basin sign installed December 15, 2015

Intermountain Power Waste Water Basin sign installed December 15, 2015

Appendix J.

CCR 30 DAY INSTRUMENTATION INSPECTION FORM

Name:______________

Date:______________

Intermountain Power Bottom Ash Basin (UT00463)			
Basin Level			
Basin High Level Reading			(ft.)
Perched Wells			
Inspection Item	Water above screen	Depth to Bottom of Screen from Top of Casing	Depth of Water if at/above Bottom of Screen
Level of Perched Well BA-PO7	Yes ☐ No ☐	37.9 ft.	(ft.)
Level of Perched Well BA-PO8	Yes ☐ No ☐	47.1 ft.	(ft.)
Level of Perched Well BA-PO9	Yes ☐ No ☐	19.5 ft.	(ft.)
Level of Perched Well BA-P11	Yes ☐ No ☐	22.6 ft.	(ft.)
Level of Perched Well BA-P12	Yes ☐ No ☐	19.2 ft.	(ft.)
Level of Perched Well BA-P16	Yes ☐ No ☐	21.2 ft.	(ft.)
Level of Perched Well BA-P17	Yes ☐ No ☐	21.7 ft.	(ft.)
Level of Perched Well BA-PO1	Yes ☐ No ☐	30.9 ft.	(ft.)
Level of Perched Well BA-P02	Yes ☐ No ☐	31.4 ft.	(ft.)
Level of Perched Well BA-PO4	Yes ☐ No ☐	31.0 ft.	(ft.)

Intermountain Power Waste Water Basin (UT00468)			
Basin Level			
Basin High Level Reading			(ft.)
Perched Wells			
Inspection Item	Water above screen	Depth to Bottom of Screen from Top of Casing	Depth of Water if at/above Bottom of Screen
Level of Perched Well WW-PO2	Yes ☐ No ☐	16.0 ft.	(ft.)
Level of Perched Well WW-PO3	Yes ☐ No ☐	16.0 ft.	(ft.)
Level of Perched Well WW-PO4	Yes ☐ No ☐	14.0 ft.	(ft.)
Level of Perched Well WW-PO5	Yes ☐ No ☐	24.9 ft.	(ft.)
Level of Perched Well WW-PO7	Yes ☐ No ☐	24.9 ft.	(ft.)
Level of Perched Well WW-PO8	Yes ☐ No ☐	23.7 ft.	(ft.)
Level of Perched Well WW-PO9	Yes ☐ No ☐	14.0 ft.	(ft.)

Notes: